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Critical Thinking and Chinese Higher Education:

Assessing the value of the Western critical thinking tradition for recent developments in Chinese higher education

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Abstract

Critical thinking is widely recognised as an important aim of higher education, yet less clarity exists about how it is conceptualised and taught at course level, especially across different educational contexts. This thesis examines critical thinking teaching in Western and Chinese higher education through the three dimensions of teaching purposes, course content, and teaching methods. The purpose of this comparison is to identify the features of a critical thinking course that would be workable and context-sensitive in Chinese higher education. It poses three questions: What teaching purposes, content, and methods characterise critical thinking teaching in Western and Chinese higher education? What similarities and differences exist between these two contexts? And what aspects of Western critical thinking teaching may support the further development of critical thinking courses in Chinese higher education?

The study adopts a mixed-methods design and draws on multiple sources of evidence. These include an international scoping review of critical thinking teaching in higher education, a review of Chinese research on critical thinking in higher education, analyses of Western and Chinese university syllabuses, an analysis of Western critical thinking textbooks, a survey of Western higher education teachers, and an analysis of Chinese national education policy texts. Taken together, these sources make it possible to examine critical thinking teaching from several connected levels: published research, course design, teaching materials, practitioner perspectives, and government policy.

The findings show that Western critical thinking teaching displays a relatively stable course configuration. Across the international literature and the selected Western datasets of syllabuses, textbooks, and teacher accounts, the evidence converges around analytical skill development as the central curricular purpose, argument analysis as the core content line, and active learning as the dominant teaching mechanism. The study further suggests that more developed course designs often extend this core through supplementary components concerned with cognitive psychology, constructive dialogue, and probability. The Chinese evidence also shows strong emphasis on analysis and argumentation, alongside broader policy aims such as innovation and talent cultivation, but course boundaries are less stable,

meaning that critical thinking is less consistently framed as a distinct course domain and shows greater variation in how aims, content, and teaching procedures are specified, with fewer explicit operational routines in teaching practice.

On this basis, the thesis argues that the main value of Western approaches to critical thinking teaching for Chinese higher education lies not in direct transfer, but in its clearer curricular logic: the coherent alignment of teaching purposes, content and methods. The study proposes an evidence-informed course design for Chinese higher education built around a stable argument-analytical core, supported by active learning and supplemented by content addressing cognitive bias, dialogic engagement, and probabilistic judgement. In doing so, the proposed design connects the Western course logic identified in the thesis with Chinese policy priorities and course-level needs. The thesis concludes that the development of critical thinking courses in China depends not only on recognising critical thinking as an important educational aim, but also on translating that aim into bounded, teachable, and assessable course structures that support both analytical performance and the development of appropriate critical thinking dispositions.

This study contributes to research on critical thinking in higher education by providing a course-level comparative analysis of selected Western and Chinese materials, with the Western evidence serving primarily to reconstruct a relatively stable course logic and the Chinese evidence helping to assess its relevance, limits, and possible adaptation in context; by bringing together multiple forms of evidence; and by offering a clearer basis for understanding how critical thinking may be organised as a university course. Its conclusions are strongest in relation to curricular structure, comparative tendencies, and course development, rather than to classroom effectiveness or student learning outcomes, which remain for future research.

In loving memory of my grandmother,

Xiulan Qi (1938-2024)

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Author's declaration

I declare that, except where explicit reference is made to the contribution of others, this dissertation is the result of my own work and has not been submitted for any other degree at the University of Glasgow or any other institution.

Printed Name: Hui Wang

Signature:

Introduction

0.1 Research background

Critical thinking is widely regarded as an important goal of higher education (Davies, 2015; Van Damme & Zahner, 2022). Universities are expected not only to provide students with disciplinary knowledge, but also to develop their ability to analyse claims, evaluate evidence, make reasoned judgements, and deal with complex problems (Ennis, 1991, 2015; Facione, 1990; Halpern, 2013). As social life, technology, and public affairs become more complex, higher education places increasing value on students' capacity for analytical reasoning and judgement (Paul, 1992; Dumitru & Halpern, 2023; Gao, 2023). In this context, critical thinking matters as an educational ideal largely because it is closely related to practical capacities such as academic learning, communication, decision-making, and the ability to respond to uncertainty and disagreement (Bezanilla et al., 2019; Davies, 2019; Van Damme & Zahner, 2022).

Within higher education, treating critical thinking simply as a desirable educational objective is not sufficient. The main difficulty is not only whether critical thinking should be valued, but how it can be translated into a teachable and assessable curricular form. What remains unresolved is not only how critical thinking should be taught, but also what its primary educational purpose should be and what kind of course content can realise that purpose in a coherent and distinctive way (Bahr, 2010; Davies, 2015). For university teaching, the more important question is how critical thinking can be translated into a clear course form: one with an identifiable purpose, content organised in relation to that purpose, and teaching methods capable of supporting the intended learning outcomes (Biggs, 2014; Fink, 2013; Thomas & Lok, 2015). In other words, the issue is not only whether critical thinking should be valued, but what educational purpose it should serve and how that purpose can be enacted in the curriculum. For example, a critical thinking course may be oriented more towards academic development, or more towards improving judgement and decision-making in everyday and professional contexts. If critical thinking is to become a meaningful part of higher education in practice, rather than remaining at the level of principled endorsement,

several more specific questions need to be addressed: what the course is for, what exactly should be taught in light of that purpose, how course content should be organised, how teaching activities should be structured, and how learning outcomes should be demonstrated and assessed (Bean & Melzer, 2021; Biggs, 2014; Brookhart, 2010; Jonsson & Svingby, 2007). In this sense, the development of critical thinking courses has become a subject worthy of closer examination.

This course-level problem is particularly important in the context of Chinese higher education. In recent years, higher education reform in China has continued to emphasise the cultivation of innovative talent, independent thinking, and higher-level capabilities, while also placing greater importance on changes in teaching approaches and the improvement of educational quality (Pang et al., 2020; Peters, 2018; The State Council of the People's Republic of China, 2022; Zhong, 2006). Against this background, how to strengthen students' abilities in analysis, reasoning, argumentation, and judgement has gradually become an educational question of direct practical relevance (He & Yao, 2024; Li, 2024; Lyu, 2025). At the same time, Chinese universities have long faced several prominent teaching problems, such as a stronger emphasis on knowledge transmission than on skills development, greater reliance on teacher-led instruction with insufficient student participation, and a stronger focus on examination performance than on the cultivation of thinking (Egege & Kutieleh, 2004; Ho et al., 2001; Lu & Singh, 2017; Tan, 2016). In this context, the significance of critical thinking lies not only in its value as a general educational ideal, but also in whether it can be formulated as a coherent and teachable course that addresses these persistent pedagogical problems while also serving broader educational aims in China, particularly those related to innovation, talent cultivation, and the development of higher-level capabilities (Dong, 2015; Song et al., 2025).

However, within the policy discourse of Chinese higher education, the place of critical thinking remains not entirely clear (Dong, 2015; Jiang, 2013; Peters, 2018). Compared with policy expressions such as the cultivation of innovative talent, which have been articulated more explicitly and consistently, critical thinking has been less often highlighted as an independent objective and has more often been conveyed indirectly through related

expressions such as independent thinking, logical reasoning, and analytical ability (Pang et al., 2020; The State Council of the People's Republic of China, 2022; Zhong, 2006). This suggests that, although critical thinking is closely related to current higher education reform in China, its curricular meaning and pathways of implementation still require further clarification (Chen, 2017; Dong, 2015). At the level of course development in particular, an important unresolved question is how critical thinking can be translated from a general educational objective into a course structure with clear purposes, stable content, and workable forms of teaching.

It is against this background that the present study is situated. At the macro level, universities may express broad expectations related to critical thinking, for example by seeking to cultivate independent and innovative thinkers who can respond to complex challenges and contribute responsibly to society. These expectations overlap with critical thinking but should not be treated as equivalent to it. They describe general qualities expected of graduates but do not specify what a particular critical thinking course should develop. At course level, by contrast, a purpose may be to develop a specific capability, such as students' ability to express their ideas clearly and support them with relevant reasons and evidence. More specifically, the study analyses critical thinking teaching in Western and Chinese higher education through the three dimensions of teaching purposes, content, and methods, and further considers which aspects of Western experience may best support the development of critical thinking courses in Chinese higher education. In doing so, the study seeks to address a more concrete question: how critical thinking can be conceptualised in higher education as a course with an internal structure, a clear pedagogical logic, and practical feasibility.

0.2 Research problem

Despite the growing importance attached to critical thinking in higher education, the literature has not yet provided a sufficiently clear account of critical thinking teaching at the level of the course (Davies, 2015, 2019; Van Damme & Zahner, 2022). Existing studies have offered extensive discussion of critical thinking and have examined different ways of promoting it in higher education (Abrami et al., 2008; Bezanilla et al., 2019). However, less

attention has been given to more basic curricular questions: what teaching purposes critical thinking courses are expected to serve, what content they should include, and what methods should be used to teach them (Davies, 2015; Thomas & Lok, 2015). As a result, critical thinking is often widely endorsed in principle, while its conceptualisation and organisation as a course remains less clearly specified (Bahr, 2010; Davies, 2019).

Before critical thinking teaching can be compared, developed, or adapted across contexts, a clearer analytical basis is needed. Examining teaching purposes, content, and methods makes it possible to identify what different courses are trying to achieve, how those aims are translated into teachable content, and whether classroom methods are aligned with intended learning outcomes. Clarifying these dimensions therefore provides the basis for understanding critical thinking as a course rather than simply as a general educational aim.

The need for such clarification becomes even clearer when the focus shifts to comparison across educational contexts. If Western experience is to support the further development of critical thinking teaching in China, it is not enough to describe Western and Chinese higher education separately (Dong, 2015). A more systematic comparison is needed, based on a shared analytical framework. Teaching purposes, content, and methods need to be examined across the two contexts in order to clarify both their commonalities and their differences. In the present study, however, this comparison is not treated as a symmetrical one. The Western materials provide the main basis for reconstructing a relatively stable course logic, while the Chinese materials are used primarily to assess how far such a logic appears relevant, reinterpreted, or constrained in the Chinese higher education context. Without such a framework, it is difficult to distinguish substantive similarities from superficial ones, or core curricular differences from more peripheral variations. It is also difficult to assess which aspects of Western critical thinking teaching may inform a workable course framework for Chinese higher education.

Questions of transfer further reinforce this need for comparison. Educational practices developed in one context cannot simply be assumed to apply directly in another. If Western experience is to offer useful support for Chinese higher education, it is necessary to

understand more clearly which aspects of critical thinking teaching are relatively stable, which are context-dependent, and how different purposes, content emphases, and teaching methods are combined in practice. Without such analysis, recommendations for course development risk remaining either too general to be useful or too context-specific to travel well.

These unresolved issues provide the basis for the present study. Taken together, they indicate the need for a clearer course-level account of critical thinking teaching, a more systematic comparison between Western and Chinese higher education, and a more grounded basis for judging what aspects of Western experience may best support the development of this subject area in China.

0.3 Research aims, objectives, and research questions

In light of the research problem identified above, this study aims to identify and analyse the teaching purposes, content, and methods of critical thinking teaching in order to examine how selected aspects of Western experience may inform a workable critical thinking course framework for Chinese higher education.

To achieve this aim, the study has three objectives. The first is to identify the teaching purposes, content, and methods that characterise critical thinking teaching in Western and Chinese higher education. The second is to compare these features across the two contexts to clarify their main similarities and differences. The third is to identify the aspects of Western critical thinking teaching that may have the greatest value for the further development of critical thinking courses in Chinese higher education.

These objectives are addressed through the following research questions:

1. What are the teaching purposes, content, and methods of critical thinking teaching in Western and Chinese higher education?
2. What are the similarities and differences between the critical thinking teaching purposes, content, and methods in Western and Chinese higher education?
3. Which aspects of Western approaches to critical thinking teaching may support the

further development of critical thinking teaching in Chinese higher education?

0.4 The significance of the study

By bringing Western and Chinese materials into comparative relation, the study provides a more concrete basis for considering how critical thinking courses may be developed under Chinese higher education conditions. This is especially important in the Chinese context, where innovation and talent cultivation are strongly emphasised, while critical thinking is often embedded within broader capability goals and course boundaries may remain less clearly specified. The study therefore helps clarify how critical thinking course development in China may move from broad legitimation towards a more explicit and operational course form, and how policy expectations may be connected to a bounded, teachable, and assessable curricular core. Its value lies not in proposing simple transfer from Western experience, but in supporting more context-sensitive thinking about what kind of critical thinking course design may be feasible and educationally defensible in Chinese universities.

The study also brings together a body of material that can support further research. Through its use of international and Chinese research, Western and Chinese syllabuses, textbooks, teacher perspectives, and policy documents, it assembles a broader empirical base for the study of critical thinking teaching than is less often available in discussions relying on a single source or a single national context. This not only supports the present analysis, but also provides a basis for future research on how critical thinking courses are structured in different higher education contexts, how particular course components and teaching approaches may be further developed and evaluated, and how policy discourse is translated into curriculum documents and classroom practice.

0.5 Structural outline

The thesis is organised into eleven chapters.

Chapter One provides the conceptual foundation of the study. It reviews major definitions, conceptual components, and central debates surrounding critical thinking as an academic discipline, with particular attention to those aspects of the literature that are most relevant to

the analysis of critical thinking courses in higher education. It also explains why this thesis examines critical thinking teaching through the three dimensions of teaching purposes, content, and methods.

Chapter Two sets out the methodology. It explains the mixed-methods design of the study, the rationale for combining multiple sources of evidence, and the procedures used to collect and analyse the data. It also clarifies how the analytical framework developed in Chapter One is operationalised in the later empirical chapters.

Chapters Three to Nine present the main empirical analyses. Chapter Three reviews the international literature on critical thinking teaching in higher education and examines how teaching purposes, content, and methods are represented across worldwide studies. Chapter Four turns to the Chinese literature on critical thinking in higher education and considers how critical thinking teaching has been discussed in that context. Chapters Five and Six analyse Western and Chinese critical thinking course syllabuses respectively, focusing on their stated purposes, content, and methods. Chapter Seven examines Western critical thinking textbooks to identify how course content and teaching activities are structured in fuller pedagogical detail. Chapter Eight draws on teacher survey data to explore how some Western teachers describe their aims, course design, classroom practice, and the practical challenges they encounter in teaching critical thinking. Chapter Nine analyses Chinese national education policy texts to clarify the policy context within which critical thinking course development is situated. Together, these chapters build the comparative evidence base of the thesis from multiple sources.

Chapter Ten brings these findings together and moves from comparison to course-oriented synthesis. Drawing on the patterns identified across the earlier chapters, it develops an analytically grounded framework for thinking about critical thinking course design in Chinese higher education. In particular, it considers how Western conceptions of purpose, content and methods may be interpreted and adapted in relation to the opportunities and constraints identified in the Chinese context.

The conclusion chapter revisits the research questions, summarises the main findings, reflects on the significance and limitations of the study, and considers directions for future research.

Taken together, the thesis moves from conceptual clarification to methodological design, to empirical comparison, and finally to course development. In this way, it progresses from identifying how critical thinking teaching can be understood and structured, to examining how it differs across Western and Chinese higher education, and then to considering what kinds of course development may be supported in the Chinese context.

Chapter One: A narrative review of critical thinking: definitions, concepts, and debates

1.1 Introduction

Critical thinking is widely regarded as an important aim of higher education, yet it remains a contested concept in educational theory and practice. Across philosophy, psychology, and education, scholars have defined critical thinking in different ways and have emphasised different aspects of it, including reflective thinking (Dewey, 1933), the assessment of reasons (Ennis, 1985; Siegel, 1988), cognitive skills (Ennis, 1985; Facione, 1990; Halpern, 1998, 2013), and intellectual dispositions (Facione, 1990; Paul & Elder, 2006; Siegel, 1988). As a result, although the term is frequently invoked in policy and curriculum, there is no single universally accepted definition of what critical thinking is, what components it includes, or how it should be taught. This conceptual plurality has important implications for curriculum design. If critical thinking can include reflective inquiry (Dewey, 1933), logical analysis (Ennis, 1985), fair-minded judgement (Paul & Elder, 2006; Siegel, 1988), Problem Solving (Halpern, 2013), creativity (Bailin, 2002), dialogue (Kuhn, 1999; Walton, 1989), and disciplinary reasoning (McPeck, 2016), then the ways it is translated into higher education teaching will vary accordingly.

The purpose of this chapter is therefore to provide a narrative review of the definitions, concepts, and major debates surrounding critical thinking that are most relevant to the thesis's central concern: identifying the features of a workable and context-sensitive critical thinking course framework for Chinese higher education. The chapter does not attempt to offer an exhaustive history of all critical thinking theories. Instead, it focuses on those strands of the literature that help explain why critical thinking has been conceptualised in different ways in higher education and why these differences matter for the study of critical thinking courses. In this sense, the chapter functions as a conceptual starting point for the rest of the thesis. It clarifies the main meanings attached to critical thinking, identifies the skills and dispositions most commonly associated with it, and reviews a core debate in the literature, the question of whether critical thinking is a generalisable capability or one that is

inseparable from disciplinary knowledge and context. These discussions establish the conceptual basis for examining which course purposes, content, and teaching methods may be relevant and adaptable to Chinese higher education.

1.2 Review design and scope

This chapter employs a narrative review to examine definitions, concepts and the debate surrounding critical thinking. This approach is suited to the present purpose because critical thinking is characterised by conceptual plurality rather than definitional consensus. The literature contains multiple overlapping interpretations, and the central challenge is therefore not simply to gather sources, but to synthesise them in a way that clarifies major lines of meaning, recurring components, and unresolved tensions.

To ensure a clear and transparent basis for source selection, relevant literature was identified through a structured search process guided by predefined inclusion principles. Using the Boolean search strategy (Brunton et al., 2017), the search terms used to identify potential studies were (‘critical thinking’ AND (definition OR concept OR theory) AND EXACTKEYWORD: ‘Critical Thinking’). Eligible sources included peer-reviewed journal articles, scholarly books, and book chapters published in English. No date restrictions were imposed. Searches were conducted in ERIC, Web of Science, and Scopus, and were supplemented by handsearching to identify additional influential works relevant to the review focus.

The scope of the review is limited to literature that addresses critical thinking as a concept. It therefore concentrates on definitional and theoretical discussions rather than on the broader empirical literature on classroom intervention, disciplinary embedding, or assessment outcomes. This boundary is deliberate. Before examining how critical thinking is enacted in courses, it is important to clarify what the term is taken to mean and which conceptual strands are most central to its interpretation.

As such, the narrative review serves a foundational role in the thesis. It establishes the conceptual background needed for the later analysis of critical thinking courses and provides

the basis for identifying which aspects of the literature are most relevant to curriculum design.

1.3 Findings

1.3.1 Defining critical thinking

To offer recommendations for critical thinking courses in China, it is first necessary to understand and explain what critical thinking is. An understanding of the definition of critical thinking is fundamental to research in this field, as it directly influences how critical thinking is taught and assessed (Ennis, 1989; Facione, 2011; Halpern, 2013; Paul & Elder, 1992). However, the literature on critical thinking contains a plurality of definitions, and this has made the task of precise definition persistently difficult. Johnson and Hamby (2015) argue that the field of critical thinking is not marked by a lack of definitions, but by an abundance of competing ones. These definitions differ not merely in wording; they are often embedded in different theoretical commitments and different teaching logics. In other words, definitional disputes persist not because scholars have failed to find a better synonym, but because they are in fact addressing different questions. Some definitions are more concerned with the normative standards that critical thinking ought to follow. Others focus more on whether critical thinking is transferable or dependent on subject-specific content (this issue is discussed further below). A further group of definitions emphasises how critical thinking should be taught and measured. For this reason, definitional differences extend into curriculum design and expected learning outcomes, making some disagreements difficult to resolve through mere terminological refinement. A related but distinct explanation is offered by Possin (2016), who suggests that this persistent disagreement is related to the way the concept of critical thinking itself is constituted. In his view, critical thinking is not the kind of concept that can be easily reduced to a neat set of necessary and sufficient conditions. It has a degree of vagueness, is marked by overlapping rather than fully unified features, and is especially prone to slipping into neighbouring concepts, for example by being expanded into general ‘good thinking’. That is to say, beyond disciplinary and theoretical differences, critical thinking itself presents an inherent problem of boundary management: if it is defined too narrowly, important aspects of the concept may be excluded; if it is defined too broadly, it loses distinctiveness.

Faced with this difficulty, the aim of this chapter is not to resolve every definitional disagreement or to select one final formulation as definitively correct. Rather, the task is to determine whether, despite persistent plurality, the literature still contains recurrent conceptual orientations that can provide a workable basis for analysis. When the literature is read in this way, one major line of convergence becomes visible: critical thinking is repeatedly understood as an evaluative practice centred on reasons, arguments, and judgement. At the same time, this core does not by itself capture the full range of concerns that later definitions have sought to address. A definition centred only on reasons and judgements risks leaving underexplained the conditions under which such evaluation is actually exercised, sustained, or distorted in practice. For this reason, influential accounts have gradually expanded the concept to include additional dimensions, especially dispositions, dialogue, and psychological factors. The discussion that follows therefore proceeds in two steps: it first identifies the shared evaluative line that gives critical thinking its definitional centre, and then examines the further dimensions that support, extend, and complicate that centre.

1.3.1.1 Commonalities across definitions

Despite differences in emphasis and formulation, many widely cited definitions converge in their emphasis on reasons, judgement, and the evaluation of arguments. Ennis (1991) defines critical thinking as ‘reasonable reflective thinking focused on deciding what to believe or do’ (p. 6), placing reflective judgement at the centre of the concept. Siegel (1988) similarly defines the critical thinker as one who is ‘appropriately moved by reasons’ (p. 23), thereby condensing critical thinking into responsiveness to justificatory force. Possin (2016) makes this reason-based dimension even more explicit by defining critical thinking as ‘the practice of identifying, having, and giving good reasons for one’s beliefs, values, and actions, given one’s goals of truth and avoidance of error’ (p. 8). Other definitions express the same orientation through more explicit attention to arguments. Bassham et al. (2011) define critical thinking in terms of the skills and dispositions needed to ‘identify, analyze, and evaluate arguments and truth claims’ (p. 1), while Bowell and Kemp (2014) describe the critical thinker as one who can ‘act and believe in accordance with good reasons’ (p. 1).

Fisher and Scriven (1997) likewise define critical thinking as the 'skilled, active interpretation and evaluation of observations, communications, information, and argumentation as a guide to thought and action' (p. 21). In the Delphi Report (an expert consensus exercise carried out by the American Philosophical Association and an influential statement on the definition of critical thinking in education), critical thinking is defined as 'purposeful, self-regulatory judgement which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgement is based' (Facione, 1990, p. 3).

Although these definitions differ in wording and emphasis, they converge in a structurally important way. They do not treat critical thinking merely as general intelligence and higher-order thought in the abstract. Rather, they repeatedly present it as a disciplined activity of assessing support for claims. In these formulations, reasons function as the grounds offered for belief or action; arguments provide a structure through which those grounds can be identified, reconstructed, and examined; and judgement marks the evaluative outcome of determining whether the support offered is adequate. Some definitions foreground reflection, some emphasise reasons, some stress argument evaluation, and some focus on criteria-based judgement, but all point toward the same underlying orientation: critical thinking involves examining justificatory support in order to reach a more defensible conclusion about what to believe or do.

This does not mean that all influential definitions reduce critical thinking to argument analysis in a narrow or purely formal sense. Nor does it ignore the relevance of dispositions, dialogue or psychology, all of which will be discussed in the following sections. However, it does suggest that a line of definitional convergence lies in the evaluation of reasons, arguments, and claims for the purpose of judgement. This core is important for the thesis because it identifies a conceptual basis for analysing critical thinking courses.

1.3.1.2 Supporting conditions: dispositions, dialogue, and psychology

The evaluative line identified above does not fully explain how critical thinking is enacted

and sustained in practice. For that reason, a further set of accounts expands the concept by drawing attention to the conditions under which evaluative judgement becomes possible and reliable. These accounts emphasise dispositions, dialogue, and psychological influences on thinking.

a) Critical thinking dispositions

One important development in the literature is the recognition that critical thinking depends not only on skills, but also on dispositions. Paul and Elder (1992) argue that critical thinking requires the development of intellectual virtues or traits, including fairmindedness, intellectual humility, intellectual perseverance, intellectual courage, intellectual empathy, intellectual autonomy, intellectual integrity, and confidence in reason. On this view, critical thinking is not simply a matter of being able to analyse and assess reasoning, but also of being disposed to do so in a fair-minded, self-critical, and truth-oriented way. Similarly, Browne and Keeley (2007) define critical thinking in terms of awareness of critical questions, the ability to ask and answer them at appropriate times, and the desire to use them actively. In both cases, critical thinking is not reduced to cognitive performance alone. It also involves a willingness to inquire, to question, and to bring evaluative standards to bear when circumstances require them. This line of thought helps explain why the possession of analytical tools does not by itself guarantee critical thought: without the inclination to use those tools, the skills remain dormant.

b) Dialogue

The literature also broadens the concept of critical thinking by emphasising its dialogic dimension. This perspective challenges the image of critical thinking as a purely internal or solitary cognitive act by highlighting its dialogic and interpersonal dimensions. On this view, critical thinking is not exercised only within individual reflection, but also through the giving, asking, contesting, and defending of reasons in interaction with others. Dialogue matters because reasoning is often sharpened through disagreement, clarification, and response. Walton's work is important here because it broadens the understanding of critical thinking by emphasising different dialogical contexts and the reasoning strategies appropriate to them. His approach analyses the structure and norms of dialogue and provides tools for identifying

fallacies and reasoning errors within different forms of argumentative exchange (Walton, 2006).

Other theorists develop this dialogic orientation in more explicitly collaborative directions. Gilbert's concept of coalescent argumentation stresses that effective argument involves not only logical coherence but also emotional and relational dimensions that can support mutual understanding (Gilbert, 1995). Similarly, Makau and Marty's model of cooperative argumentation presents critical thinking as a constructive process in which participants work together to explore disagreement and move toward resolution through cooperation and mutual respect (Makau & Marty, 2001). More recent work places dialogue even closer to the centre of the concept itself. Kuhn (2019, p. 146) argues that critical thinking is not just 'an individual ability or skill' but 'a dialogic practice people engage in and commit to'. Hanscomb (2023, p. 91) likewise emphasises constructive dialogue, arguing that critical thinkers should be prepared to articulate their views clearly, listen seriously and respectfully to others, and avoid distorting opposing positions. These accounts suggest that dialogue extends critical thinking by showing how the evaluation of reasons and arguments is enacted and refined in interpersonal exchange. In this sense, dialogue can be shown to be an important (perhaps indispensable) extension of critical thinking.

c) Psychology

Psychological perspectives add a further important dimension by drawing attention to how critical thinking operates under real cognitive conditions. Among the various definitions of critical thinking, Halpern's is one of the clearest examples of a psychological orientation. She defines critical thinking as 'the use of those cognitive skills or strategies that increase the probability of a desirable outcome' (Halpern, 1998, p. 450). What is distinctive here is that the emphasis shifts from ideal standards of argument alone to the empirical details of information processing. Psychological research has also drawn attention to the links between critical thinking and the wide range of cognitive biases that can affect judgement and decision-making (Stanovich & West, 2008). If recurring errors in informal reasoning, such as seeing causal relationships where none exist, making hasty generalisations, or judging an argument by irrelevant features of the arguer, occur with some regularity, it is reasonable to

ask what underlying cognitive tendencies predispose people to make such mistakes. From this perspective, critical thinking is not only a matter of knowing the standards of good reasoning, but also of understanding how actual thinking is vulnerable to bias, heuristic shortcuts, and predictable error (Halpern, 1998; Stanovich & West, 2008). Psychology therefore enriches critical thinking by helping to explain why judgement fails, how self-monitoring becomes necessary, and why metacognitive control is essential to more reliable reasoning in practice.

1.3.2 Conceptual components of critical thinking

While the previous section examined how critical thinking has been defined in the literature, definitions alone are not sufficient for the purposes of this thesis. Definitional statements are useful in identifying the broad orientation of the concept, but they often remain too compressed to show clearly what critical thinking consists of in teachable and analysable terms. For curriculum analysis, it is necessary to move from the level of definition to the level of conceptual components. This shift makes it possible to unpack the internal structure of critical thinking and to clarify which elements need to be cultivated in critical thinking courses. As the discussion in the previous section has shown, recurring definitional themes such as the evaluation of arguments and reasons, the importance of dispositions, the role of dialogue, and the influence of psychological processes do not stand as separate or unrelated dimensions. Rather, they can be understood as contributing to two major conceptual components of critical thinking: critical thinking skills and critical thinking dispositions. The evaluative treatment of arguments is expressed mainly through the skills dimension; the willingness to inquire, to be fair-minded, to reconsider, and to engage responsibly with others is expressed mainly through the dispositions dimension. At the same time, dialogue and psychological considerations are not excluded from this framework. Instead, they are incorporated within it: dialogue informs both the skill of reason-giving and constructive engagement with others and the disposition to deliberate respectfully and openly, while psychological perspectives emphasise the metacognitive and self-regulatory aspects of critical thinking as well as the dispositions needed to resist bias and monitor one's own reasoning. For this reason, the present section develops the concept of critical thinking not by treating argument, disposition, dialogue, and psychology as four separate components,

but by showing how they are integrated into the more analytically useful categories of critical thinking skills and critical thinking dispositions. This skills-dispositions framework provides a common basis for comparing what different courses seek to develop and, later, for considering which curricular elements may be relevant and adaptable to Chinese higher education.

1.3.2.1 Critical thinking skills

Existing literature has proposed a wide range of critical thinking skill lists, although some scholars use the term abilities (Ennis, 1985) or competencies (Fisher & Scriven, 1997). In this section, these terms refer to the thinking skills through which a person is able to examine claims, assess reasons, and reach more defensible judgements about what to believe or do. Table 1-1 presents representative lists proposed by major scholars in the field, providing an overview of the range of critical thinking skills identified across the literature.

Table 1-1 Representative lists of critical thinking skills

Scholar	Main critical thinking skills / abilities / competencies mentioned
Ennis (1962)	Grasping meaning; identifying ambiguity; judging contradiction; judging whether conclusions follow; judging whether statements are sufficiently specific; judging whether observation statements are reliable; judging whether inductive conclusions are warranted; identifying assumptions; judging definitions; judging the acceptability of authority statements
Ennis (1991)	Focusing on a question; analysing arguments; asking and answering clarification questions; understanding and using graphs and mathematics; judging source credibility; observing and judging observation reports; deducing and judging deductions; making and judging inductive inferences and value judgements; defining terms; handling equivocation; attributing unstated assumptions; thinking suppositionally; dealing with fallacy labels; checking the quality of one's own thinking; employing rhetorical strategies
Facione (1990)	Interpretation, analysis, evaluation, inference, explanation, and self-regulation; with sub-skills such as categorisation, clarifying meaning, identifying arguments, assessing claims, querying evidence, drawing conclusions,

	presenting arguments, self-examination, and self-correction
Halpern (1998)	Analysing the structure of problems and arguments; recognising structural features of reasoning tasks; checking for accuracy; monitoring progress; metacognitive monitoring
Siegel (1988)	Assessing reasons; evaluating the force of reasons; assessing claims on the basis of reasons; making judgements grounded in reasons
Paul (1992)	Clarifying issues and meanings; developing evaluative criteria; assessing source credibility; questioning deeply; analysing and evaluating arguments; generating and assessing solutions; reading critically; listening critically; engaging in Socratic discussion; reasoning dialogically; examining assumptions; distinguishing relevant from irrelevant facts; making inferences and interpretations; giving reasons; recognising contradictions; exploring implications and consequences
Fisher and Scriven (1997)	Interpretation and evaluation of observations, communications, information, and argumentation as a guide to thought and action

However, the existence of many skill labels does not mean that they all refer to distinct abilities. Different scholars often use different terms to describe similar operations or express the same ability at different levels of abstraction. Some authors employ broad category labels such as analysis, evaluation, and inference, whereas others use more specific formulations, such as judging whether a conclusion follows necessarily, distinguishing relevant from irrelevant reasons, or assessing credibility. As a result, the literature can appear more diverse and fragmented than it actually is - broad headings in one framework often correspond to sub-skills or concrete performances in another. For example, in some accounts the relationships among inference, reasoning, and argument are presented as separate skill labels, yet in practice they often refer to closely connected aspects of the same process. Inference concerns the movement from reasons or evidence to a conclusion, reasoning refers more broadly to the activity of working through claims and support relations, and argument provides the structured form in which such reasoning is expressed and assessed. Seen in this way, many apparently separate skills may be better understood as overlapping descriptions of related argumentative operations. This suggests the need for a clearer classification of

critical thinking skills, so that broad domains, sub-skills, and context-specific performances are not treated as if they were equivalent units of analysis.

Before categorising these skills, the way in which critical thinking is currently organised needs to be explained. One of the first to begin classifying critical thinking skills was Bloom's cognitive skills, which is a widely cited source by educational practitioners when it comes to teaching and assessing higher-order thinking skills. It has six major categories, from lower to higher: they are knowledge, comprehension, application, analysis, synthesis, and evaluation (Bloom et al., 1956).

- **Knowledge:** recognising or remembering facts, terms, basic concepts, or answers without having to understand their meaning.
- **Comprehension:** Explain key ideas and concepts and convey meaning through classification, summary, inference, and comparison.
- **Application:** Solve problems in new situations by applying the knowledge, facts, techniques, and rules acquired. Use knowledge to solve problems and identify how things are connected and how they are applied in new situations.
- **Analysis:** Examine information and break it down into component parts, identify relationships between the parts, determine motives or reasons, make inferences, and find evidence to support generalizations.
- **Synthesis:** organizing ideas and statements in writing, ability to propose ways of testing a hypothesis, ability to formulate and modify hypotheses.
- **Evaluation:** Evaluation involves making and defending opinions by judging the validity of information, ideas or the quality of work based on a set of criteria.

The lowest category, though it is called 'knowledge', is confined to objectives of remembering information and being able to recall or recognise it, without much transformation beyond organizing it. The five higher categories are collectively termed 'intellectual abilities and skills' (Bloom et al., 1956). The term can simply be understood as another name for critical thinking abilities and skills:

Thus, it is expected that when the student encounters a new problem or situation, they will

select an appropriate technique for addressing it and will bring to bear the necessary information. This has been labelled ‘critical thinking’ by some, ‘reflective thinking’ by Dewey and others, and ‘problem solving’ by still others. In the taxonomy, we have used the term ‘intellectual abilities and skills’ (Bloom et al., 1956).

While recognising the value of these categories, Ennis (1981) points out that they lack criteria applicable across topics and domains. For example, analysis in chemistry is so different from analysis in literature that there is not much point in teaching analysis as a general type of thinking. Further, the validity of the hierarchy seems questionable at the higher levels of Bloom’s taxonomy. For example, the ability to identify logical fallacies and the ability to organise statements and ideas in writing, though they engage distinctly different cognitive skills, they can be seen to be equally demanding. The former primarily involves critical analysis and evaluation of arguments for fallacious reasoning, whereas the latter emphasises coherent structuring and presentation of ideas.

The above suggests that Bloom’s taxonomy may not fully capture the structure of critical thinking skills. Wales and Nardi (1984) therefore refined this framework by classifying thinking into lower-level thinking skills, thinking skills (or higher-level thinking), and complex thinking skills. Comprehension and application are treated as lower-level thinking skills, mainly associated with learning factual knowledge and completing relatively simple tasks. Higher-level thinking refers to the analysis and synthesis of information. Complex thinking, by contrast, involved moving beyond the acquisition and analysis of surface information towards deeper understanding, evaluation, and the more reflective application of knowledge.

Davies developed the classification method based on Wales and Nardi. He emphasises that in addition to the three skills mentioned earlier, metacognition is also a crucial component of critical thinking, defining it as ‘thinking about thinking’ (Davies, 2015). He first collated the critical thinking skills that had been mentioned several times in different literature and then grouped them according to four categories: low-level thinking, high-level thinking, complex thinking and thinking about thinking (Davies, 2015). Although Davies’ framework

is clear, it is not sufficiently detailed for the purposes of this review. The analysis that follows therefore draws on his framework but adapts it. This review compiles a list of critical thinking skills from leading scholars, merges overlapping terms, selects skills that were mentioned repeatedly across the literature, and organises them using an adapted version of Davies' framework.

Low-level thinking

This category includes skills primarily concerned with the initial clarification, recognition, and organisation of meaning and structure. Although these skills do not necessarily involve full evaluative judgement, they are foundational in the sense that they make later analysis and evaluation possible (Davies, 2015).

a. Clarification and interpretation

This category refers to the ability to identify the central issue under discussion, clarify the meaning of words and statements, detect ambiguity, and interpret the significance of information in context (Ennis, 1991; Facione, 1990; Paul, 1992). It is described here as foundational because it concerns the preliminary work of making the object of thought clear before deeper analysis and evaluation can occur (Davies, 2015). In critical thinking, misunderstanding the question, misreading the claim, or failing to notice ambiguity can undermine all subsequent reasoning (Ennis, 1991; Facione, 1990).

b. Argument identification and structural analysis

This category includes recognising whether a text or utterance contains an argument, identifying its premises and conclusion, uncovering implicit assumptions, and tracing the inferential structure that connects reasons to claims (Ennis, 1991; Facione, 1990; Halpern, 1998; Paul, 1992). It is placed within 'low-level' thinking because it is concerned with identifying the formal structure of reasoning before its quality is judged (Davies, 2015). This skill category provides the analytical groundwork for later evaluation of argument strength, evidence, and judgement (Facione, 1990; Ennis, 1991).

High-level thinking

This includes skills that move beyond identification and clarification to involve analysis, assessment, comparison, and justified judgement. These are 'high-level' because they require the thinker to apply standards, weigh alternatives, and reach reasoned conclusions (Davies, 2015).

a. Argument evaluation

This category concerns the assessment of arguments and the reasons offered in their support (Ennis, 1962, 1991; Siegel, 1988; Facione, 1990; Paul, 1992; Fisher and Scriven, 1997; Halpern, 1998; Stanovich & Stanovich, 2010). It includes judging whether premises and evidence are acceptable, relevant, and sufficient for the conclusion being advanced (Ennis, 1991; Facione, 1990; Paul, 1992; Fisher & Scriven, 1997), and involves identifying weaknesses in support, including fallacies and other reasoning that fails to provide adequate logical support (Ennis, 1991; Facione, 1990; Paul, 1992). This belongs to high-level thinking because it requires evaluation rather than just recognition and organisation: the thinker must not merely understand what information or arguments are presented, but also judge how strong they are (Davies, 2015; Paul, 1992; Ennis, 1991).

b. Judgement and decision-making

This category involves weighing competing positions, comparing alternative explanations or solutions, tracing implications and consequences, and arriving at reasoned judgements (Bailin & Battersby, 2009; Ennis, 1991; Facione, 1990; Paul, 1992; Siegel, 1988). It represents a still more synthetic form of high-level thinking, because the thinker must integrate evidence, argument assessment, and contextual considerations in order to decide what to believe or what to do (Davies, 2015). In this sense, judgement and decision-making can be seen as one of the culminating outcomes of critical thinking (Facione, 1990; Siegel, 1988).

Complex thinking

In Davies' (2015) framework, this category refers to forms of critical thinking that are dialogical and socially situated in character. Although the label 'complex thinking' is

retained here for consistency with his classification, ‘dialogical thinking’ may be a more precise description of the skills grouped under this heading. These skills involve the interactive use of reasoning in contexts of discussion, disagreement, and response, where critical thinking depends not simply on considering alternative claims, but on engaging with other people’s objections, interpretations, and reasons in order to clarify, defend, revise, or reconsider one’s own judgement.

a. Constructive dialogue and reason-giving

This category includes active listening, responding constructively to others’ reasons, anticipating objections, engaging in Socratic questioning, and communicating and defending one’s conclusions (Bailin et al., 1999a; Facione, 1990; Fisher & Scriven, 1997; Kuhn, 2019; Paul, 1992). It fits the category of ‘complex thinking’ because reasoning here is no longer treated as an entirely private mental process. This dimension is especially important in educational contexts that treat critical thinking as something enacted through discussion, deliberation, and reason-giving, rather than as a purely individual activity (Bailin et al., 1999a; Kuhn, 2019).

Thinking about thinking

This category corresponds to metacognitive regulation and includes skills through which thinkers monitor, examine, and regulate their own cognitive processes. Davies treats this as a distinct and essential component of critical thinking, defining it as ‘thinking about thinking’ (Davies, 2015).

a. Psychological and metacognitive regulation

This category includes suspending prior beliefs, recognising and resisting cognitive bias, reflecting on the influence of assumptions or emotion, and revising conclusions when errors are detected (Facione, 1990; Halpern, 1998; Stanovich & Stanovich, 2010). It belongs to ‘thinking about thinking’ because its focus is not only on the object of reasoning, but on the thinker’s own reasoning processes (Davies, 2015). This category also incorporates the psychological realities of critical thinking, acknowledging that good reasoning is often obstructed by bias, prior commitment, overconfidence, or affective interference (Halpern,

1998; Stanovich & Stanovich, 2010). For that reason, critical thinking requires not only analytical ability but also self-awareness and regulation (Facione, 1990; Halpern, 1998).

1.3.2.2 Critical thinking dispositions

The term ‘disposition’ is widely used in critical thinking research to denote habits of mind and attitudes that have a causal role in being a good critical thinker. Without these dispositions, even if one possesses critical thinking skills, an individual might choose not to use these skills due to a lack of motivation or a reluctance to engage in effortful thinking. Moreover, the problems encountered in real life are often complex and varied, requiring not only an understanding of critical thinking skills but also the flexibility to apply them appropriately in different contexts. For instance, when confronted with two conflicting news reports about a controversial public issue, a person may have the ability to evaluate evidence and identify weak reasoning yet still fail to do so unless they are disposed to inquire further, consider alternative interpretations, and reflect critically on their own assumptions. This necessitates a proactive inclination to explore and apply these skills. Therefore, possessing relevant dispositions is a crucial part of being a good critical thinker.

Given the variety of terms and lists used in the literature, this section adopts the disposition framework proposed in the Delphi Report as its primary basis for classification. This framework is used because it is one of the most influential accounts of critical thinking dispositions, and because it emerged from expert consensus rather than from the perspective of a single author. Importantly, the Delphi Report does not merely enumerate desirable traits, it organises dispositions into two broad domains: dispositions that shape one’s general approach to life and inquiry, and dispositions that guide one’s approach to specific problems. This makes it useful as an organising framework for reviewing the literature, since it distinguishes between broad intellectual orientations, such as inquisitiveness, open-mindedness, and fair-mindedness, and more task-directed dispositions, such as clarity, diligence, persistence, and precision (Facione, 1990).

At the same time, the Delphi framework is not treated here as exhaustive. Later and parallel discussions of critical thinking dispositions introduce additional emphases that are

theoretically important, even when they overlap with the Delphi categories. For example, Bailin et al. (1999a) stress dispositions such as respect for reasons and truth, independent-mindedness, and respect for others in group inquiry and deliberation; Siegel (1988) gives greater weight to the critical attitude, including a principled commitment to letting reasons govern belief and action; and Aikin and Clanton (2010) highlight the importance of group-deliberative virtues for reasoning well with others in shared contexts. For this reason, the present section uses the Delphi Report as the principal classificatory structure, while also incorporating additional dispositions identified in other influential accounts where they extend these categories.

A further consideration is that with the Delphi framework the distinction between approaches to life and living in general and dispositions that guide one's approach to specific problems is not always easy to maintain. Some dispositions can be understood both as broad intellectual orientations and as qualities that become visible in acts of judgement, inquiry, or deliberation. As a result, a degree of overlap between the two domains is difficult to avoid. The aim of the present review is not to resolve this classificatory problem, but to use the Delphi framework as a way of organising the literature.

Approaches to life and living in general

This category refers to broad intellectual orientations that shape how a person approaches inquiry, judgement, and belief across contexts, rather than only in response to a specific problem. What unifies them is that they are relatively general tendencies of mind and character that influence how a person lives intellectually. They shape the thinker's overall stance toward evidence, self-correction and responsible judgement. In this sense, they function as enduring orientations toward good thinking in everyday life, academic inquiry, and practical decision-making (Facione, 1990; Bailin et al., 1999a).

a. Truth-seeking and respect for reason

This refers to a person's general commitment to forming beliefs based on good reasons and credible evidence, rather than on preference or authority alone. It includes wanting to know what is true, trusting the value of reasoned inquiry, respecting strong intellectual work, and

recognising the importance of legitimate expertise when it is relevant. It also includes a negative side: resistance to distorted thinking, careless reasoning, and the inconsistent use of standards. For example, a truth-seeking thinker does not accept weak evidence for a view they happen to like while demanding much stronger evidence for views they dislike. Bailin et al. (1999a) describe this broadly as 'respect for reasons and truth,' while Siegel (1988) connects it to the critical attitude, in which beliefs and actions are governed by reasons rather than by arbitrariness or self-interest. Paul's emphasis on confidence in reason points in the same direction, highlighting the idea that reason is not merely a technique but a norm for judgement (Paul, 1992). Thus, this disposition is about more than 'wanting to be right'; it is about recognising that beliefs ought to be answerable to reasons and evidence (Bailin et al., 1999a; Paul, 1992; Siegel, 1988).

b. Open-mindedness and flexibility

This refers to the willingness to consider alternatives rather than becoming fixed in one's initial view. A critically minded person does not treat their first reaction as final. Instead, they remain open to other explanations, competing viewpoints, and the possibility that a different conclusion may be better supported. This includes listening seriously to opposing views, avoiding absolute or black-and-white thinking, and being willing to revise one's judgement when stronger reasons emerge. It means allowing judgement to remain responsive to evidence instead of being closed off by prior commitment. In the Delphi Report, this appears in open-mindedness, flexibility, and willingness to reconsider and revise one's views (Facione, 1990). Ennis (1991) similarly emphasises looking for alternatives and being open-minded, while Stanovich and Stanovich (2010) use the idea of actively open-minded thinking to describe a disposition to seek out competing views and avoid premature certainty. Properly understood, however, open-mindedness does not mean being easily swayed; it means remaining willing to revise one's view when stronger reasons or better evidence warrant doing so.

c. Fair-mindedness and intellectual integrity

This refers to the disposition to judge fairly, not only when assessing other people's arguments, but also when examining one's own beliefs and assumptions. It includes

impartiality, honesty about personal bias, and a willingness to apply the same standards to oneself that one applies to others. Unlike open-mindedness, which concerns willingness to consider alternative views, fair-mindedness is concerned with impartiality and the consistent application of standards across positions, including one's own. Intellectual integrity concerns consistency and honesty in the use of standards. A thinker lacks integrity if they criticise weak reasoning in others but excuse the same weakness in their own preferred position. In the Delphi Report, this group includes fair-mindedness in appraising reasoning and honesty in facing one's own biases, prejudices, stereotypes, and egocentric or sociocentric tendencies (Facione, 1990). Paul (1992) strengthens this interpretation by treating fairmindedness and intellectual integrity as intellectual traits that prevent thinking from being distorted by self-interest or double standards. This disposition is essential because critical thinking is not only about detecting weaknesses in others' arguments; it is also about being willing to scrutinise oneself by the same criteria.

d. Inquisitiveness and epistemic vigilance

This combines two related ideas. The first is a positive desire to understand: curiosity, interest in questions, and a wish to remain well informed. The second is a cautious attitude toward what one is asked to believe: not accepting claims passively, but asking whether they are adequately supported. Together, these two elements capture a balanced orientation toward inquiry. A good critical thinker is neither passively credulous nor cynically dismissive. Instead, they are interested enough to ask questions and careful enough to check whether the answers are trustworthy. In the Delphi Report, this appears in inquisitiveness, concern to become and remain well informed, and alertness to opportunities to use critical thinking (Facione, 1990). Bailin et al. (1999a) describe a similar orientation as an 'inquiring attitude', which means being alert to the possibility that information may be unreliable, incomplete, or misleading. In practice, this disposition helps explain why some people actively seek understanding while others merely absorb whatever they are told.

e. Prudence

This refers to the disposition to judge with appropriate restraint. It involves exercising care

in deciding when to suspend judgement, when to draw a conclusion, and when to revise one's view. This disposition is important because critical thinking requires more than confidence; it also requires sensitivity to the limits of one's evidence and resistance to premature closure. A prudent thinker is not indecisive by nature, but proportionate in judgement. They do not rush to closure when the evidence is weak, and they do not stubbornly refuse revision when the evidence improves. In the Delphi Report, prudence and willingness to reconsider are central dispositions (Facione, 1990). Halpern (1998) adds the related idea that good thinkers are willing to abandon unproductive strategies and self-correct.

f. Intellectual autonomy and courage

This refers to the strength required to think for oneself and to follow good reasons even when doing so is difficult. Intellectual autonomy means not simply adopting views because they are socially dominant, emotionally comfortable, or supported by authority. It means thinking independently under the guidance of evidence and reasons. Intellectual courage means being willing to confront ideas that are unwelcome, unpopular, or threatening to one's prior beliefs. These two qualities belong together because independent judgement often requires courage. For example, a student may understand an argument against a commonly accepted position, but still avoid endorsing it for fear of criticism or exclusion. In that case, the missing element is not skill but disposition. Bailin et al. (1999a) connect independent mindedness with the honesty and courage needed to seek relevant evidence despite pressures to do otherwise. Paul (1992) also treats intellectual autonomy and intellectual courage as core intellectual traits. Critical thinking is not only about being open to revision, it is also about being able to resist conformity and follow reasons when doing so is personally or socially uncomfortable.

g. Dialogical and deliberative dispositions

This extends the previous heading into the context of shared reasoning and group discussion. It refers to dispositions that help people deliberate well together rather than merely think well alone. Aikin and Clanton (2010) identify a preliminary set of such virtues: friendliness, temperance, courage, sincerity, and humility. These may initially look like general moral qualities, but in deliberative contexts they perform significant intellectual functions.

Friendliness, including empathy and charity, helps participants interpret one another's contributions in constructive rather than hostile ways. Temperance helps regulate anger, defensiveness, or escalation in disagreement. Courage enables someone to voice a relevant but unpopular view. Sincerity discourages strategic distortion or manipulative self-presentation. Humility keeps participants open to the possibility that they may need to revise their position. Together, these virtues make discussion more cooperative and more likely to yield sound collective judgement. They can therefore be understood as an extension of the Delphi framework, especially of those dispositions concerned with fairness, understanding others, and honesty about bias (Aikin & Clanton, 2010; Facione, 1990).

Dispositions that guide one's approach to specific problems

This category refers to dispositions that become most visible when a person is dealing with a particular question, argument or decision. Whereas the previous category concerns broad intellectual orientation, this concerns how that orientation is enacted in concrete tasks. The Delphi Report identifies seven dispositions that guide one's approach to specific issues, questions, or problems: *clarity in stating the question or concern, orderliness in working with complexity, diligence in seeking relevant information, reasonableness in selecting and applying criteria, care in focusing attention on the concern at hand, persistence through difficulties are encountered, and precision to the degree permitted by subject and circumstances* (Facione, 1990). However, this classification is limited in two respects. First, clarity, orderliness, care, and precision can be integrated into a broader disposition of carefulness and holistic consideration, since together they describe a cautious, orderly, and context-sensitive way of approaching judgement rather than clearly distinct dispositions.

Second, some items overlap with 'Approaches to life and living in general'. Critical thinking dispositions are not merely endorsed in principle, but are necessarily expressed in practice. As a result, some of the dispositions listed under 'guiding one's approach to specific problems' do not add sufficiently distinct dispositional content, but instead describe how broader dispositions appear when a thinker is dealing with a concrete task. For example, persistence when difficulties are encountered is closely connected with intellectual autonomy and courage, because a person who is willing to follow reasons despite discomfort,

uncertainty, or pressure will characteristically continue with inquiry rather than abandon it when a problem becomes difficult. The boundary is therefore blurred because these supposedly problem-specific items often describe not a separate class of dispositions, but the concrete enactment of broader dispositions already identified above. For this reason, the section does not reproduce the Delphi framework unchanged, but retains only those elements that can still be treated as distinct within a revised account of problem-guiding dispositions.

a. Carefulness and holistic consideration

This refers to disciplined attention to what exactly the issue is, how its parts fit together, and what context matters for judging it well. It includes seeking clarity about the question, proceeding in an orderly way, focusing attention carefully, aiming for the degree of precision the subject permits, and taking the total situation into account (Facione, 1990). The phrase 'holistic consideration' means not treating one part of a problem in isolation when it must be understood within a wider evidential or practical context. Ennis (1991) is useful here because he explicitly includes seeking a clear statement of the question, taking the total situation into account, seeking as much precision as the situation requires, and dealing in an orderly manner with the parts of a complex whole. Together, these elements form a cautious, orderly, and context-sensitive way of approaching judgement.

b. Criterion-guided judgement

This refers to a disposition to let one's judgement be guided by standards that are relevant and appropriate to the issue under consideration, rather than by immediate preference, intuition, or shifting standards. It involves a habitual readiness, when faced with a question or decision, to ask what standards should govern the judgement and to let those standards regulate the evaluation in a consistent way. The Delphi Report states directly in its reference to reasonableness in selecting and applying criteria as part of one's disposition to specific issues, questions, or problems, and further characterises good critical thinking as involving the use of criteria that are defensible (Facione, 1990). Case and Wright (1997) reflect the same disposition when they argue that critical judgement requires careful thought about what criteria to use when judging alternatives and one's own reasoning, and that such criteria must be applied appropriately in context rather than mechanically. Lipman (1988) points in the

same direction when he argues that critical thinking relies upon criteria, while also insisting that good judgement is self-correcting and sensitive to context. This helps distinguish criterion-guided judgement from rigid rule-following or doctrinaire adherence to fixed standards.

In this section, the review has drawn on multiple scholars to identify and describe a wide range of critical thinking dispositions, using Facione's distinction between dispositions that shape one's general approach to life and inquiry and those that guide one's approach to specific problems as an organising framework. The present review aims to identify as fully as possible the range of dispositions associated with critical thinking across the literature. A more precise conceptual categorisation of these dispositions, including clearer distinctions between general orientations and their context-specific enactments, remains an issue that would benefit from further theoretical work and may therefore be a productive direction for future research.

1.3.3 A debate in the literature

The debate over whether critical thinking is generic or specific remains a contentious issue, and one with important implications for its teaching and assessment. If critical thinking has common features across domains, this suggests that it is generalisable and transferable from one context to another, allowing for the development of broadly applicable teaching approaches and assessment tools. This claim is more plausible in relation to critical thinking as applied to a sub-section of everyday decision making where individuals are required to assess reasons, evidence, and competing claims in contexts where the specialist knowledge that typifies academic research does not apply (ranging from purchasing decisions to parenting decisions to casting votes in an election, jury deliberations, and citizens assemblies). Conversely, when critical thinking is considered in relation to academic subjects, its transferability may be more limited, since its effective use often depends on disciplinary knowledge, subject-specific standards and methods. Addressing this controversy is therefore important not only for clarifying the concept of critical thinking, but also for explaining the curricular focus adopted in the thesis's later examination of critical thinking course development in Chinese higher education.

1.3.3.1 Critical thinking as generic

One influential position in the literature holds that critical thinking is generic. On this view, critical thinking consists of generalisable skills and dispositions that can be learned in one context and transferred to others (Ennis, 1989, 2011; Halpern, 1998, 2014; Siegel, 1988). Supporters of this position argue that certain core operations of thought, such as identifying arguments, distinguishing premises from conclusions, evaluating reasons, assessing evidence, and detecting weaknesses in inference, recur across a wide range of contexts rather than belonging exclusively to any one discipline (Ennis, 1985, 2011; Facione, 1990; Paul, 1992). This view has particular force when critical thinking is considered in relation to a sub-section of everyday decision making, where individuals are required to assess competing claims, judge the credibility of information, and reach decisions without relying on the kind of specialised knowledge that typifies academic inquiry (Halpern, 1998, 2014; Siegel, 1988).

Siegel offers a more explicitly generic account of critical thinking. He argues that critical thinking is fundamentally a matter of being appropriately moved by reasons, which requires both the ability to assess reasons and the disposition to let reasons guide belief and action (Siegel, 1988, 1997). On this view, critical thinking is not confined to the epistemic standards of any particular discipline, because the demand to evaluate reasons, judge their strength, and regulate belief accordingly applies across contexts. Although different fields involve different subject matter, the underlying norm of reason assessment remains general. Critical thinking is therefore understood as a broadly transferable form of rational judgement rather than a competence constituted solely by discipline-specific knowledge (Siegel, 1988, 1997).

This position has had considerable influence in educational practice. In the United States, for example, the 1980s saw the development of numerous courses devoted to general thinking skills, reflecting the assumption that critical thinking could be cultivated through stand-alone instruction rather than only through subject-based teaching (College Entrance Examination Board, 1983). These courses were designed to develop broad critical thinking abilities and dispositions that students could apply across academic and non-academic contexts. Similarly, the development of standardised critical thinking assessments, including the Cornell Critical Thinking Tests, was grounded in the view that at least some aspects of

critical thinking can be identified, taught, and measured independently of particular disciplines (Ennis, 2011).

The attraction of the generic position lies partly in its educational promise. If critical thinking has a substantial common core, then it becomes possible to justify stand-alone courses, cross-curricular teaching aims, and broadly applicable assessment tools. It also supports the widely held belief that higher education should equip students not only for success within particular subjects, but also for informed judgement in everyday life and public discourse.

1.3.3.2 Critical thinking as discipline-specific

In contrast, another major position holds that critical thinking is not primarily a general skill but a discipline-specific or domain-sensitive capacity. On this view, critical thinking cannot be adequately understood, taught, or assessed apart from the forms of knowledge, standards of evidence, and modes of argument or research methods that characterise particular disciplines. What counts as a good question, a strong justification, or an acceptable conclusion depends to a large extent on the epistemic norms of the field in question. As a result, critical thinking in history, physics, law, medicine, or literary studies cannot simply be treated as the same capacities operating on different content.

McPeck is one of the most influential advocates of this position. He argues that critical thinking depends upon knowledge of a discipline and an understanding of its epistemology and content, both of which are necessary for effective argumentation and judgement (McPeck, 2016). From this perspective, attempts to teach critical thinking in a purely generic way are problematic because they abstract reasoning from the very contexts in which it acquires meaning and force. McPeck therefore rejects the idea of universal thinking skills in any strong sense, maintaining that thinking is always thinking about something, and that educational institutions should not treat critical thinking as an isolated subject detached from substantive knowledge. Instead, critical thinking should be embedded within disciplinary teaching, where students can learn to reason in accordance with the conceptual and evidential standards of the subject.

Related positions can be found in the work of Moore, Bailin et al., and Willingham. Moore (2004), for example, questions overly general accounts of critical thinking by showing that different academic fields value different forms of reasoning and critique. Bailin et al. (1999a) similarly argue that critical thinking cannot be reduced to a set of decontextualised skills, since good thinking is inseparable from knowledge, criteria, and standards appropriate to particular domains.

This position is also supported by empirical work. Jones (2015), drawing on interviews with academics in physics, economics, history, law, and medicine at two Australian universities, found that conceptions of critical thinking varied across disciplines and were shaped by disciplinary epistemologies. Her findings suggest that what counts as critique, justification, or sound reasoning is not uniform across academic fields, but instead reflects the assumptions and practices of particular knowledge traditions. For example, in physics, critical thinking may centre on evaluating the adequacy of a model, the validity of experimental design, and the consistency of results with established theory, whereas in history it may involve assessing the reliability of sources, interpreting evidence in context, and weighing competing accounts of past events. These differences are not merely differences of subject matter. They also reflect the fact that disciplines rely on different research methods to establish warranted claims and to reject weaker or opposing ones. This helps to explain why critical thinking in academic subjects is often regarded as inseparable from disciplinary ways of knowing.

1.3.3.3 A combined perspective on critical thinking

However, the literature also includes positions that explicitly combine generic and discipline-specific elements. This is implicit in Ennis's discussion of the general, infusion, immersion, and mixed approaches to teaching critical thinking. In particular, the infusion approach does not treat critical thinking as either separate from subject matter or reducible to it. Rather, it assumes that general critical thinking principles can be taught through disciplinary content, so that students learn both the underlying critical standards and their application within particular fields (Ennis, 1989). In this sense, Ennis's framework itself points towards a combined model rather than a strict opposition between generic and specific

accounts. Empirical support for this combined view can be found in Abrami et al. (2008)'s meta-analysis of instructional interventions. Reviewing 117 studies with 341 effect sizes, they found an overall positive effect of instruction on critical thinking and concluded that effective teaching strategies existed in both generic and content-specific forms. Their findings are consistent with the possibility that critical thinking can be developed through approaches that combine general critical principles with subject-matter application, rather than through an exclusive choice between the two.

Davies (2013) develops this combined view. His main criticism of discipline-specific accounts is that they rely on a false dichotomy: either critical thinking is a universal abstract skill, or it is merely a loose label for different disciplinary modes of thought. Davies argues that this choice is unnecessary. He proposes an infusionist position in which generic critical thinking is fundamental at one level, while discipline-specific discourse appears at higher levels. More specifically, he argues that general critical thinking consists of inferential connections and logical relationships, whereas disciplinary practices add more specialised forms of interpretation and analysis, for example in the reading of literary texts, the evaluation of historical sources, or the use of precedent in legal argument. On this view, disciplinary variation does not replace generic critical thinking, but builds upon it.

1.4 Discussion

1.4.1 Theoretical implications for the present study

As the preceding review has shown, the literature on critical thinking contains substantial definitional plurality. The aim of the chapter is to adopt a workable definition that can guide the analysis of critical thinking courses in higher education. To this end, critical thinking is not treated here as an indefinitely expanding concept to which ever more desirable educational aims can simply be added, since this would risk making the concept overly diffuse and analytically weak. Instead, this study begins from a shared core that recurs across influential definitions and then incorporates those additional elements that appear necessary to explain how such evaluation is exercised and sustained in practice.

Although definitions of critical thinking differ across philosophy, psychology, and education,

they are not unrelated or exclusive. A recurrent line of convergence can be identified in the evaluation of reasons, arguments, evidence, and judgement. At the same time, differences among definitions often function as complementary extensions rather than direct contradictions, drawing attention to further conditions of good critical thinking, such as dispositions, dialogue, and psychological factors.

This definition helps to define the scope of the present research. In particular, it provides an initial basis for identifying what counts as a critical thinking course. At minimum, such courses would be expected to include some engagement with the study of arguments, reasons, or judgement, since these constitute the most stable conceptual core of critical thinking across the literature. This does not mean that all courses will be identical in emphasis, nor that other themes cannot also be present. It does, however, provide a starting point for distinguishing critical thinking courses from more general courses in higher education that may promote reflective learning, communication, or other desirable capacities without making the evaluation of reasons and judgement a central focus.

At the same time, Chapter One also develops a conceptual basis on which the present study analyses critical thinking courses in higher education. As the review has shown, critical thinking cannot be understood adequately through definitional statements alone. Although influential accounts converge on a core centred on reasons, arguments, and judgement, they also indicate that this core becomes educationally meaningful when it is translated into more specific and teachable dimensions. For this reason, the chapter has further examined critical thinking in terms of two major conceptual components: critical thinking skills and critical thinking dispositions.

This distinction is important because it makes it possible to move from abstract conceptual discussion to the analysis of curriculum and teaching. The skills dimension refers to the principal cognitive operations through which critical thinking is exercised, such as clarification, argument identification, evaluation, judgement, constructive reason-giving, and self-regulation. The dispositions dimension refers to the intellectual orientations that make such thinking possible, reliable, and educationally significant, including truth-seeking

and respect for reason, open-mindedness and flexibility, fair-mindedness and intellectual integrity, inquisitiveness and epistemic vigilance, prudence, and intellectual autonomy. These dimensions provide a more structured account of what critical thinking consists of in teachable terms. They also show that critical thinking courses need to be examined in relation to the kinds of thinking they seek to develop, the aspects of critical thinking they select for teaching, and the conditions through which such thinking is expected to be practised.

This provides the rationale for the analytical framework adopted in this study. If critical thinking includes both cognitive operations and intellectual dispositions, then its curricular expression cannot be captured by content alone. Teaching content remains important, because it reveals which aspects of critical thinking are selected for instruction, such as argument structure, standards of evidence, evaluation of claims, dialogue, or metacognitive awareness. However, the literature reviewed in Chapter One also shows that critical thinking is not reducible to a set of techniques or procedures. It also involves broader intellectual aims concerned with how students are expected to approach inquiry, judgement, disagreement, and revision. The analysis of teaching purposes is therefore necessary because critical thinking courses often aim not only to teach students how to analyse and evaluate, but also to cultivate dispositions such as intellectual autonomy, open-mindedness, and responsible judgement. In this respect, purposes indicate what kind of critical thinker a course seeks to form.

The same applies to teaching methods. Psychological and dialogical accounts of critical thinking suggest that it is not simply transmitted as conceptual knowledge. Critical thinking also needs to be exercised through practices that support discussion, reflection, challenge, response, and self-monitoring (Halpern, 1998; Aikin & Clanton, 2010). Teaching methods are therefore analytically significant because they reveal how courses attempt to translate stated purposes and selected content into educational practice. Methods such as questioning, dialogue, debate, collaborative inquiry, reflective tasks, and guided evaluation are important not merely as classroom techniques, but as pedagogical forms through which critical thinking is enacted.

The decision to analyse courses through teaching purposes, teaching content, and teaching methods is also supported by scholarship on course design in higher education. For example, Devlin and Samarawickrema (2010) argue that effective university teaching depends on coherence among aims, concepts, learning activities, and assessment. Bovill and Woolmer (2019) likewise show that curriculum in higher education must be understood through wider frameworks that connect curricular purposes, learner positioning, and course organisation. Similarly, Simonson et al. (2022) describe effective course design as the integration of learning goals, scaffolded teaching and learning activities, and feedback processes. These accounts support the same principle: meaningful course analysis requires attention to what a course aims to develop, what it selects for learning, and how learning is delivered. In the present study, this framework also provides a common basis for comparing Western and Chinese materials and for assessing the potential relevance of selected aspects of Western experience to course development in Chinese higher education.

1.4.2 Why the study focuses on stand-alone critical thinking courses

Because the question of whether critical thinking should be understood as generic or as specific remains unresolved, it is necessary for the present study to delimit its scope in the first instance to a course form with clearer boundaries and a more clearly defined object of analysis. Stand-alone critical thinking courses constitute a more suitable object of study, not only because they offer a clearer and more manageable focus for analysis, but also because they make it possible to examine whether critical thinking can function as a distinct and meaningful field of teaching in its own right. If critical thinking can only be taught in embedded form, this would suggest that it is not sufficiently coherent or distinctive to justify separate curricular development. This issue is particularly important for the present study, since it bears directly on whether stand-alone critical thinking courses are worth continuing to develop in Chinese higher education. In the present study, stand-alone critical thinking courses refer to courses in which critical thinking is presented as an explicit and primary object of teaching and learning, rather than being embedded implicitly within another disciplinary subject. Such courses are identified through course titles, syllabus descriptions, stated learning outcomes, and teaching content that directly foreground critical thinking, reasoning, argument analysis, or related concepts as the main curricular focus.

In academic environments, it is understandable that the teaching and use of critical thinking often depend on a discipline's particular knowledge, methods, and standards. This gives considerable force to discipline-specific accounts such as McPeck's, since successful judgement in academic inquiry often relies on specialised forms of knowledge and standards that are not easily transferable across fields. However, acknowledging these limits does not diminish the broader value of critical thinking. It may be helpful to look beyond academic settings and consider its potential relevance across a wide range of non-specialist contexts in which individuals must assess reasons, evidence, and competing claims without relying on the kind of specialist knowledge that typifies academic research. In such contexts, certain critical thinking skills and dispositions, such as argument reconstruction, open-mindedness and curiosity, may still support better judgement. These skills and dispositions can, for example, enable people to better spot fallacies in committee-based decision making or political debates, and contribute to a more reflective and flexible approach to unfamiliar problems. Psychological research (Halpern, 1998) likewise suggests that open-mindedness may help individuals use their existing cognitive resources more flexibly outside traditional academic boundaries. From this perspective, the broader value of critical thinking need not rest on the assumption that standardised logical techniques transfer seamlessly across all fields, but may instead lie in supporting a more thoughtful approach to reasoning and decision-making across a wide range of everyday, professional, and civic situations.

From this perspective, the universality of critical thinking need not be strictly defined by the seamless application of standardised logical techniques across all fields. It could instead be seen as an attempt to support the development of an individual's overall approach to reasoning and decision-making, in both academic and non-academic contexts.

Having clarified what is meant by a stand-alone critical thinking course and having situated this course form within the broader generic–specific debate, it is now possible to explain more precisely why it provides an appropriate focus for the present study. Stand-alone critical thinking courses are not theoretically neutral. To organise critical thinking as a distinct course subject already implies that at least some aspects of it are considered sufficiently general to be taught explicitly and, to a certain extent, relatively independently of a single disciplinary domain. In this sense, such courses may be understood as reflecting,

at the curricular level, an educational response that leans towards the generic side of the debate.

However, the value of focusing on these courses does not depend on treating that position as finally established. Rather than attempting to resolve the generic–specific debate in the abstract, the study examines how one influential curricular response to that debate is expressed in practice. More specifically, it investigates how critical thinking is defined, organised, and taught when it is treated as an explicit educational object. This makes stand-alone courses useful for the purposes of the study, because they provide a clearer and more bounded site in which assumptions about the teachability, scope, and educational function of critical thinking can be examined through course purposes, content, and methods.

This focus is also important in relation to the applied aims of the research. If Chinese higher education is to consider whether, and under what conditions, stand-alone critical thinking courses may offer a feasible and educationally meaningful option for curriculum development, it is first necessary to understand how such courses are actually constructed in practice, what they prioritise, and what kinds of curricular assumptions they embody. For this reason, focusing on stand-alone courses provides not only a theoretically significant point of entry into the debate, but also a more practical basis for generating recommendations that are clearer, more operational, and more relevant to curriculum development in Chinese higher education.

From a methodological perspective, stand-alone courses provide a more clearly bounded unit of curricular analysis than embedded or infusion-based approaches. Because critical thinking is treated as an explicit object of instruction, it becomes easier to identify stated aims, selected content, and teaching methods without these being as heavily dispersed across disciplinary teaching arrangements. This does not remove wider contextual influences, but it does make stand-alone courses a more tractable basis for comparative curriculum analysis. For these conceptual, practical, and methodological reasons, the present study focuses on stand-alone critical thinking courses as the manageable unit through which to examine how critical thinking is organised and taught in higher education.

1.5 Chapter summary

This chapter has provided a narrative review of critical thinking by examining its major definitions, conceptual components, and central debates. It began by showing that the literature does not offer a single universally accepted definition of critical thinking, but instead presents a range of overlapping accounts developed across philosophy, psychology, and education. Despite this plurality, the review identified a recurrent line of convergence in the evaluation of reasons, arguments, evidence, and judgement. It then argued that this evaluative core, although important, is not sufficient on its own to capture the full meaning of critical thinking in educational practice. For this reason, the chapter further examined the broader conditions that support and extend critical thinking, especially dispositions, dialogue, and psychological or metacognitive regulation.

Building on this discussion, the chapter moved from the level of definition to the level of conceptual components. It argued that, for the purposes of the present study, critical thinking can be analysed usefully through the interrelated dimensions of critical thinking skills and critical thinking dispositions. This conceptual distinction provides a more structured and teachable account of what critical thinking consists of, while also supporting the analytical framework adopted in the thesis. On this basis, the chapter explained why the present study examines critical thinking courses through the dimensions of teaching purposes, teaching content, and teaching methods. It also explained the debate over whether critical thinking is generic or discipline-specific, and argued that, although the debate remains unresolved, stand-alone critical thinking courses provide a useful and clearly bounded context for examining how critical thinking is conceptualised and taught in higher education.

At the same time, the chapter has several limitations. As a narrative review, it does not aim to provide an exhaustive or fully systematic mapping of all critical thinking literature. Its purpose is selective and interpretive rather than comprehensive. The chapter has concentrated on conceptual and theoretical discussions relevant to the present thesis, especially those that help clarify what critical thinking is taken to mean, what components it includes, and why those issues matter for course design. As a result, some related areas, such as the wider empirical literature on intervention effectiveness, critical thinking assessment

in practice, and disciplinary case studies of teaching, have not been explored in depth here. In addition, the conceptual distinctions developed in this chapter, particularly those between skills and dispositions and between general and context-specific dimensions of critical thinking, should not be understood as fully settled categories. They are adopted as analytically useful working distinctions for the purposes of this study rather than as final resolutions to ongoing theoretical debates.

These limitations point to the need for the research design set out in Chapter Two. If critical thinking is conceptually plural yet still sufficiently structured to support comparative analysis, then the next step is to establish a methodology capable of examining how these conceptual dimensions are translated into educational practice. Chapter Two therefore explains how the study operationalises the analytical framework developed here through the analysis of teaching purposes, content, and methods. It also establishes the methodological basis for comparing Western and Chinese evidence and for assessing how selected aspects of Western experience may inform course development in Chinese higher education.

The chapter also provides the conceptual foundation for Chapter Three. Having clarified the main meanings attached to critical thinking and identified the dimensions relevant to curriculum analysis, the thesis is then able to move from theoretical discussion to empirical examination. Chapter Three builds on this foundation by reviewing the worldwide literature on the teaching of critical thinking in higher education. In doing so, it investigates how the purposes, content, and methods of critical thinking teaching have been represented across international studies and begins the comparative analysis that the later chapters develop further. In this sense, Chapter One establishes the conceptual groundwork, while the chapters that follow examine how these ideas are enacted, varied, and contested in actual educational contexts.

Chapter Two: Methodology

2.1 Introduction

In Chapter One, I outlined the range of definitions, conceptual frameworks, and debates surrounding critical thinking, and identified the key elements commonly regarded as central to the concept. However, it remains unclear whether, and in what ways, university-level critical thinking courses in China and in Western contexts address these core components. If they do, which elements are emphasised, and what teaching methods are used to support their development? This study therefore aims to:

- Examine the purposes, content, and teaching methods of critical thinking courses in Western and Chinese higher education, drawing primarily on course descriptions, syllabuses, textbooks, policy documents, as well as surveys of Western higher education critical thinking teachers;
- Identify key practices in Western and Chinese higher education critical thinking courses through the extraction and analysis of these materials; and
- Consider how these practices might inform the adaptation and further development of critical thinking teaching in Chinese higher education, including through a review of Chinese national education policy.

Based on these aims, the study addresses the following research questions:

1. What are the teaching purposes, content, and methods of critical thinking teaching in Western and Chinese higher education?
2. What are the similarities and differences between the critical thinking teaching purposes, content, and methods in Western and Chinese higher education?
3. Which aspects of Western approaches to critical thinking teaching may support the further development of critical thinking teaching in Chinese higher education?

This study employs a mixed-methods approach. To address the first and the second research questions, I conducted an international scoping review of critical thinking teaching in higher education (Chapter Three) and a parallel review focused on Chinese higher education

(Chapter Four); an examination of online university course descriptions and syllabuses from China and four Western countries - Australia, Canada, the United Kingdom, and the United States (Chapter Five and Six); an analysis of key English-language critical thinking textbooks (Chapter Seven); and a small-scale survey of higher education teachers in Western universities (Chapter Eight). To address the third research question, I synthesised these findings in relation to a review of Chinese national education policies related to critical thinking from 2001 to 2024 (Chapter Nine). Together, these methods provide complementary perspectives on how critical thinking is conceptualised, structured, taught, and shaped across different educational and policy contexts. The combination of these sources allows recurrent course features to be examined alongside the policy and institutional conditions that shape their relevance in Chinese higher education.

In this thesis, 'Western' is used as a practical comparative term for the relatively established patterns of critical thinking teaching identified across several sources. The starting point was the international scoping review in Chapter Three. Although international in scope, the studies that met the inclusion criteria were concentrated mainly in English-speaking countries, particularly the United States and Australia. The subsequent analyses therefore focused more closely on syllabuses and teacher responses from Australia, Canada, the United Kingdom, and the United States, together with selected English-language textbooks. The difference in terminology reflects the material being compared: the 'Western' evidence is drawn from several countries with some shared educational and intellectual traditions, whereas the Chinese evidence comes from one national context examined in greater depth. 'Western' is therefore used as a broad comparative label for the recurring course patterns reconstructed across these sources, while 'China' refers to the specific national case examined. This label does not imply that the countries represented in the selected Western evidence share a single or uniform educational tradition.

To clarify the research methodologies used in this study, this chapter is structured as follows. I first outline the theoretical and methodological foundations of the study, explaining why each method was chosen. I then detail how I collected and analysed the data from each method. Finally, I discuss the strengths and limitations of these methods, considering their

impact on the robustness of my findings. Due to the numerous methods and sources of data, some repetition and further detailing of specific search criteria are also at the beginning of each subsequent chapter.

2.2 Methodological foundation

This study adopts pragmatism as its research paradigm. Pragmatism is oriented towards Problem Solving and gives priority to the research question and the practical value of knowledge, rather than strict commitment to one ontological or epistemological position (Biesta, 2010; Biesta & Burbules, 2003; Holden & Lynch, 2004; Kaushik & Walsh, 2019; Morgan, 2014a). From this perspective, quantitative and qualitative methods are not seen as necessarily incompatible, but as different tools that can be used together when this helps to develop a fuller and more useful understanding of the phenomenon being studied. Therefore, under this paradigm, the study can draw on and analyse information from different data sources in a way that is guided by what is most suitable for answering the research questions.

Pragmatism is frequently used in education research and is appropriate for this study because it supports the use of multiple methods to investigate complex, real-world problems; in this case, how critical thinking is taught across different cultural and institutional contexts. Quantitative methods may help identify broader patterns, trends, or relationships, while qualitative methods can provide more insight into meanings, experiences, and processes. In this way, pragmatism allows the study to combine breadth and depth, and to work with different forms of evidence in a coherent way. This is especially important here because the study aims to inform the development of teaching critical thinking in Chinese higher education by drawing on both Western and Chinese practices.

A pragmatist position also fits well with the study's iterative design. The study does not apply a fixed analytical framework from the start and keep it unchanged. Instead, it continuously revises and refines the framework in response to new patterns and perspectives emerging from the data, which reflects the dynamic and open character often associated with pragmatism (Morgan, 2014b). This means that the research process involves movement between existing concepts, emerging findings, and practical interpretation. In this sense,

pragmatism supports not only methodological pluralism, but also comparison, adaptation, and application across different sources of information and data. Rather than aiming for philosophical purity, it provides a practical and coherent justification for integrating multiple methods, as long as the choices made are clearly explained in relation to the aims and questions of the study (Creswell & Plano Clark, 2018; Morgan, 2007; Tashakkori & Teddlie, 2010).

In this study, the research data are drawn from journal articles, course syllabuses, textbooks, teacher surveys, and Chinese education policies. These materials contain not only explicit information, but also implicit meanings that require interpretation. Documentary and textual data can therefore be analysed at both surface and deeper interpretive levels, making them particularly suitable for mixed-methods analysis (Bowen, 2009; Braun & Clarke, 2006; Elo & Kyngäs, 2008). For this reason, a mixed-methods approach offers particular strengths for this study. Quantitative analysis was used to identify frequencies and proportions in teaching purposes, content, and methods, while qualitative abductive thematic analysis was used to interpret the meanings and contextual significance of these patterns (Johnson et al., 2007; Tavory & Timmermans, 2014). It allows the same issue to be examined from different angles and therefore supports a stronger and more complete analysis. Quantitative data can help reveal broader patterns, trends, and relationships across courses or teachers, while qualitative data can help explain how these patterns are understood, interpreted, and enacted in practice. In this sense, mixed methods are especially useful for studying complex educational phenomena because they support complementarity, triangulation, and a fuller interpretation of the data (Creswell & Plano Clark, 2018; Greene et al., 1989; Johnson et al., 2007). Therefore, a mixed-methods is not only a practical choice for this research, but also a methodologically strong one, because it can strengthen the depth, breadth, and credibility of the analysis (Morgan, 2007; Tashakkori & Teddlie, 2010). Finally, combining multiple methods allows the study to triangulate findings across different data sources, thereby reducing the inherent narrowness of a single method (Creswell & Plano Clark, 2018; Fetters et al., 2013). Mixing methods also helps ensure that the findings are both well substantiated and contextually relevant (Bazeley, 2016; Fetters et al., 2013). Based on these advantages, this study adopts mixed methods as its methodological foundation.

2.3 Data collection and analysis procedures

2.3.1 Scoping review methodology

In the international scoping review in Chapter Three and the Chinese-focused scoping review in Chapter Four, I employed established scoping review frameworks, including those proposed by Arksey and O'Malley (2005), Levac et al. (2010), the JBI guidance for evidence synthesis (Peters et al., 2020), and the reporting guidance of PRISMA-ScR (Tricco et al., 2018), to examine stand-alone critical thinking teaching in higher education. A scoping review was appropriate because the literature in this area is broad, heterogeneous, and conceptually fragmented, with considerable variation in how critical thinking is defined, taught, and evaluated across different educational contexts. The purpose was not to determine which teaching approach is most effective, as would be more typical of a traditional systematic review, but to map the range, characteristics, and emphases of the existing literature, especially in relation to teaching purposes, content, and methods. In this sense, the scoping review was also more rigorous and transparent than a narrative review, because it required a more systematic approach to searching, selecting, and charting the literature.

These frameworks informed the development of two data-charting forms, one for Chinese sources and one for Western sources, to support the organisation and comparison of evidence prior to quantitative content and qualitative thematic coding. Although adapted to the characteristics of each dataset, both forms were structured around the same core analytical dimensions, particularly teaching purposes, content, and methods. This was important because it allowed the review to remain sensitive to contextual and linguistic differences while also establishing a shared basis for comparison across the two bodies of literature. The charting process therefore did not function only as a technical stage of data extraction, but also as an important analytical step in its own right, helping to identify recurring patterns, points of divergence, and gaps in the literature. In this way, the scoping reviews in Chapters Three and Four build on the conceptual discussion introduced in Chapter One and lay the foundation for the later thematic abductive analysis by clarifying the empirical and conceptual terrain from which the main themes were developed.

2.3.1.1 Scoping review of critical thinking teaching in international and Chinese higher education

In order to understand the purposes, content, and methods of teaching critical thinking in higher education, I conducted two parallel scoping reviews of published studies on critical thinking teaching at undergraduate and postgraduate levels. One review focused on international higher education contexts, while the other focused on critical thinking teaching in Chinese higher education. The scope of both reviews was confined to critical thinking education, particularly studies addressing teaching purposes, content, or methods. The international review included peer-reviewed journal articles published in English, while the Chinese review included relevant peer-reviewed studies published in either English or Chinese, provided that full texts were accessible. No restriction was placed on publication year. This study followed the basic PRISMA-ScR review protocol for scoping reviews (Tricco et al., 2018).

To identify relevant studies for this review, searches were conducted in the Education Resources Information Centre (ERIC), Web of Science, and Scopus. The search terms and strategies were established in consultation with supervisors to ensure comprehensiveness and accuracy. The first search was conducted in March 2022, and a final search of these databases was conducted in November 2025 to incorporate the latest findings. Using the Boolean search strategy (Brunton et al., 2017), the search terms used to identify potential studies were as follows:

(‘critical thinking’ OR ‘critical reasoning’ OR ‘argument analysis’ OR ‘argumentation’ OR ‘informal logic’) AND
(‘higher education’ OR ‘university education’ OR ‘colleges’ OR ‘universities’ OR ‘undergraduate education’ OR ‘graduate education’ OR ‘higher learning institutions’)

To identify literature relating to China, the search comprised two parallel components. The English-language component used the search string above in ERIC, Web of Science, and Scopus, with the additional limiter AND (‘China’ OR ‘Chinese’). For the Chinese-language component, the English-language search terms were translated directly into Chinese while

retaining the same Boolean structure. The resulting search string was:

(“批判性思维” OR “批判性推理” OR “论证分析” OR “论证” OR “非形式逻辑”) AND (“高等教育” OR “大学教育” OR “学院” OR “大学” OR “本科教育” OR “研究生教育” OR “高等院校”)

The search was conducted through the EBSCOhost research platform using the University of Glasgow’s institutional access, and the same eligibility criteria were applied as in the English-language search. CNKI was not included because the University of Glasgow did not hold a subscription to the database during the search period. Institutional subscriptions to CNKI are relatively rare among universities outside China. Even within China, several prominent institutions and universities, including the Chinese Academy of Sciences and Peking University, have suspended or discontinued their subscriptions because of sharply rising subscription costs and restrictive contractual terms (Leung & Sharma, 2022). This access constraint may have resulted in the omission of studies available only through CNKI and should be considered when interpreting the Chinese review.

The screening process was conducted in stages, beginning with title screening, followed by abstract screening, and then full-text review where necessary. To minimise the risk of excluding potentially relevant studies, records were retained in cases of uncertainty during the initial screening stages. Where uncertainty remained regarding study eligibility, the decision was resolved through discussion with my supervisors.

Upon completing the literature screening process, 64 papers were identified as relevant to international universities, and 6 papers met the inclusion criteria for Chinese universities. The selection process is illustrated in Figure 2-1 and Figure 2-2.

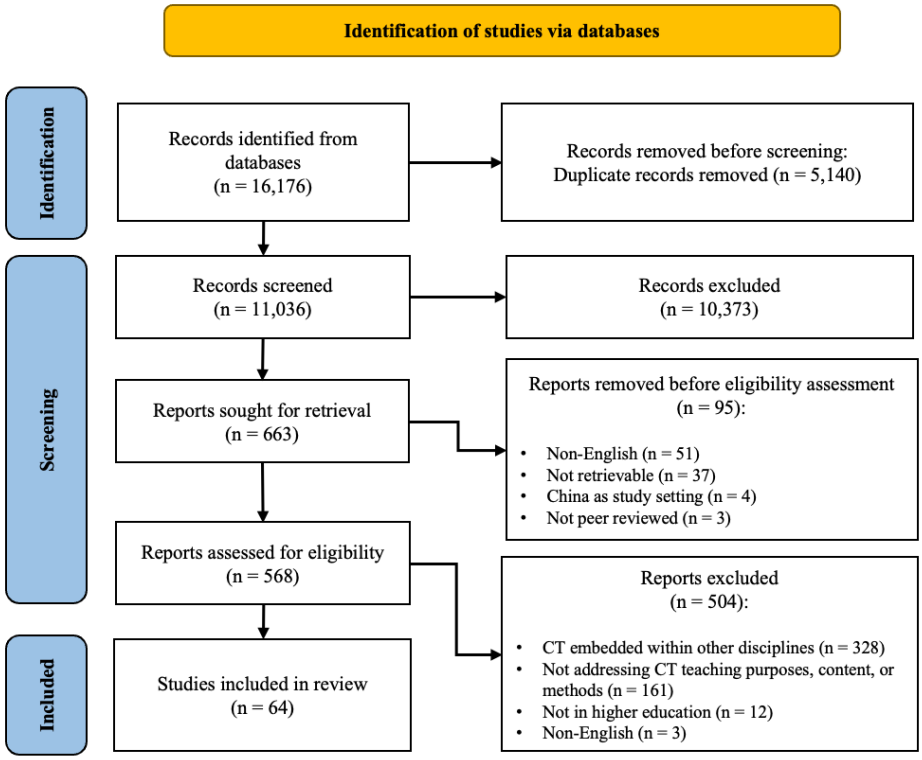

Figure 2-1 Flowchart of the scoping review process for literature on Western critical thinking teaching

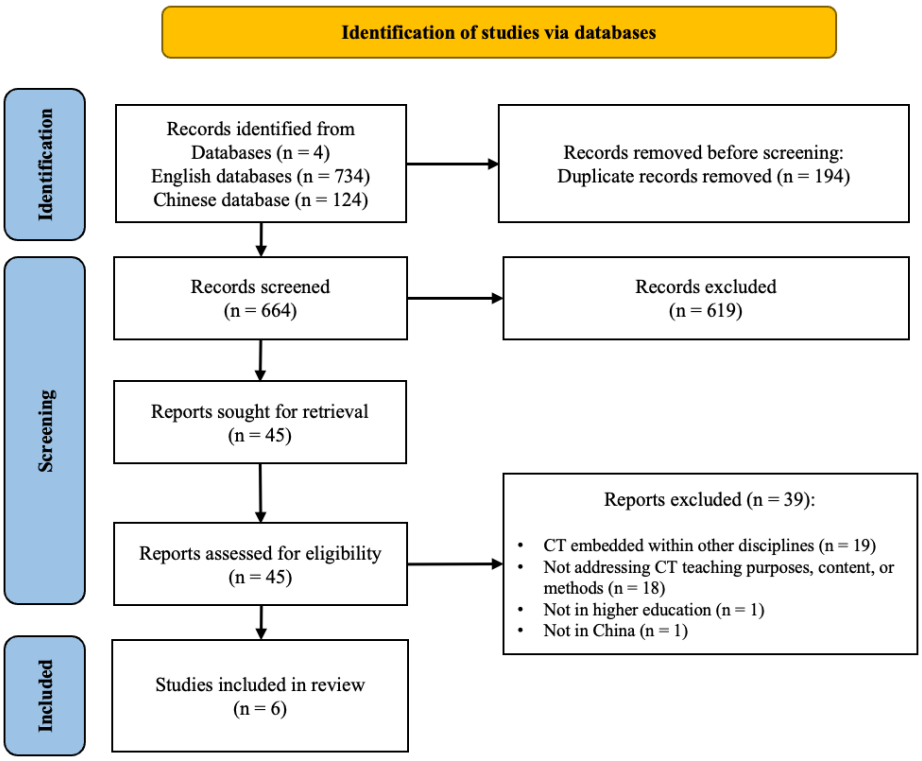

Figure 2-2 Flowchart of the scoping review process for literature on Chinese critical thinking teaching

Using quantitative content and qualitative thematic analysis, I developed two data-charting forms in Microsoft Excel (one for Chinese content and one for Western content) to extract relevant information from included evidence sources. These forms included key fields such as author, year of publication, article or chapter title, publication, journal, or university name, reference type, primary author's affiliation, country where the study was conducted, population, research aims, and methods. In line with the objectives of this review, additional columns for teaching purposes, teaching content, and teaching methods were also incorporated into the forms. In addition to these categorical variables, relevant textual excerpts were extracted from each study, and these author-reported descriptions of critical thinking purposes, content, and methods provided the qualitative basis for subsequent coding and thematic analysis.

During the data charting process, my supervisors reviewed the charted data, and any discrepancies or disagreements were discussed until a consensus was reached. The analysis highlighted existing purposes, content and teaching methods found in the research, revealing gaps and limitations, which clarified directions for future investigation. Further details of the searches, results, and analysis can be found in Chapter Three.

The coding process followed key aspects of critical thinking teaching reviewed in Chapter One, which focused on definitions of critical thinking, its associated skills and dispositions, and its significance in higher education. These conceptual discussions guided the analysis by providing an initial orientation toward core components that constitute critical thinking teaching. In particular, the discussion of the educational importance of critical thinking helped identify how teaching purposes were described in the included studies, while the description of critical thinking skills and critical thinking dispositions offered a basis for examining teaching content. Through iterative comparison between these theoretical ideas and the data, initial codes were developed, refined, and grouped into themes. Textual exemplars illustrating each theme were retained to ensure that the analysis remained grounded in the original studies while exemplifying the particular theme under examination.

2.3.1.2 Scoping review of Chinese national education policy documents

I also conducted a document-based scoping review of official Chinese education policy texts relevant to higher education and published between 2001 and 2024. The purpose of this review was to identify national educational priorities and policy trends, and to examine how these broader policy orientations may shape the development of critical thinking education in Chinese universities. Policy texts provide an important source of evidence for understanding how educational priorities are formally articulated, justified, and translated into strategic directions within the education system (Braun et al., 2010; Viennet & Pont, 2017). Accordingly, the policy review is used to provide an interpretive context for the later synthesis, rather than to prescribe a particular course model for Chinese higher education.

Documents were included if they were official national-level policy texts and were substantively relevant to understanding the educational priorities, reform agendas, and strategic directions shaping the development of critical thinking-related education in China, especially in relation to higher education. To be included, texts had to address one or more of the following: higher education development, broader education reform, curriculum or teaching reform, talent cultivation or educational quality. Some policy texts from the basic or compulsory education sectors were also included where they helped clarify broader national policy orientations relevant to the development of critical thinking-related education.

To identify documents meeting these criteria, the websites of the Chinese Government and the Ministry of Education were searched by manually browsing the ‘Policy Documents’ and ‘Policy Interpretation’ sections and by using the keyword ‘education’. Based on predetermined selection criteria, a preliminary screening of the identified policy documents was conducted to ensure that all potentially relevant texts were retained for review. The full texts of the initially screened policy documents were then obtained and assessed against the inclusion criteria. In cases of uncertainty, documents were retained to avoid excluding potentially important material. Ambiguous cases were discussed with my supervisors until consensus was reached on inclusion (see Figure 2-3).

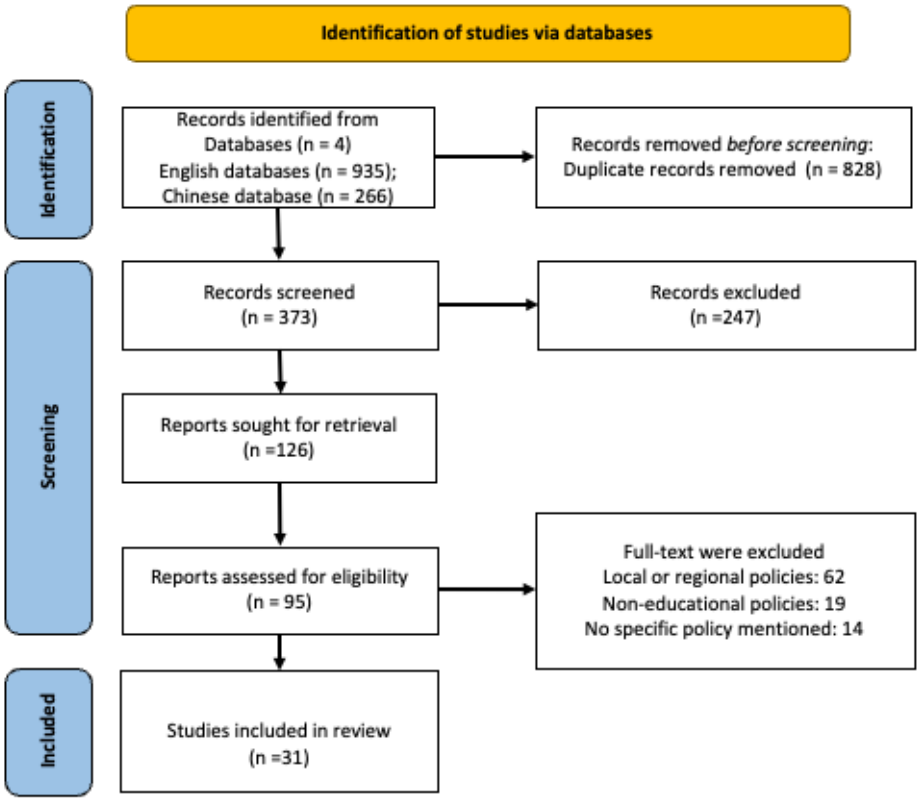

Figure 2-3 Identification and selection process for Chinese national education policy texts

After screening, 31 Chinese education policy texts met the inclusion criteria for the review. Quantitative content and qualitative thematic analysis were used to identify repeated keywords, concepts, and themes. A data-charting table was developed to record the title of each policy, the relevant webpage link, the issuing body, the date of publication, and the background, purpose, and substantive content of the policy. During the charting process, my supervisors reviewed the charted data, and any discrepancies or disagreements were discussed until consensus was reached. The findings from this analysis are presented in Chapter Nine, and a detailed list of these 31 policy texts is provided in Appendix H.

2.3.2 Thematic abductive analysis

Qualitative thematic analysis was used in examining the results of the scoping reviews. The goal of thematic analysis is to encode, categorise, and distil themes from textual data in order to uncover linguistic richness, implied meanings, and contextual insights (Braun & Clarke, 2023; Elo & Kyngäs, 2008; Joffe, 2011; Neuendorf, 2017). Through this approach, subtle differences and commonalities between pedagogical purposes, content, and methods can be identified, directly informing actionable strategies and educational practice. Thematic

analysis has also been widely used in educational research, which further supports its suitability for investigating complex educational phenomena (Atkins & Wallace, 2012; Cooley, 2013; Freebody, 2002; Sherman & Webb, 2004). This analytic approach aligns with pragmatism and with the methods of data collection because of its focus on context-dependent meanings and nuanced understandings of complex phenomena (Hammarberg et al., 2016; Maxwell, 2021). Pragmatism values knowledge that can directly inform practice and policy, and qualitative analysis complements this aim by generating rich insights from real-world examples, making the findings practically relevant and actionable.

I employed a particular type of thematic analysis called abductive analysis across all my data sources. Abductive thematic analysis involves moving iteratively between observed data and existing theories in order to develop the most plausible explanations, deepening understanding through ongoing reflection and refinement (Tavory & Timmermans, 2014; Vears & Gillam, 2022). In this sense, abductive thematic analysis combines the inductive coding of data with the deductive use of theory, allowing themes to be generated and refined through movement between empirical material and conceptual frameworks. Unlike a purely inductive approach, it does not treat themes as simply emerging from the data. Instead, it encourages the researcher to interpret observations in dialogue with prior literature, theoretical concepts, and disciplinary knowledge, so that analytical frameworks can be revised as new patterns become visible.

This approach is particularly valuable when the data contain contradictions, anomalies, or unexpected findings. Rather than treating such cases as outliers to be removed, abductive analysis treats them as analytically productive, since they may reveal gaps in existing explanations or point towards new theoretical insights (Timmermans & Tavory, 2012). In this way, abductive thematic analysis supports a deeper level of interpretation than descriptive coding alone, while still remaining open to surprise and revision. It also encourages reflexivity and theoretical creativity, since existing concepts may need to be refined, adapted, or combined in order to account more adequately for the data. Thematic abductive analysis was also particularly appropriate for my datasets because each contains both explicit and implicit meanings that require interpretation rather than simple description.

Syllabuses are not neutral records, but educational texts that reflect curricular priorities and pedagogical assumptions, making qualitative document analysis especially relevant here (Bowen, 2009; Morgan, 2022). In the case of the Western and Chinese syllabuses, this approach made it possible to identify stated course aims, content, and methods, while also examining less visible assumptions embedded in course structure, sequencing, assessment design, and the relationship between learning outcomes and teaching practice.

For the scoping reviews of Western and Chinese critical thinking teaching literature, thematic abductive analysis was beneficial because the reviewed studies do more than describe teaching purposes, content, and methods; they also reflect deeper assumptions about what critical thinking is, why it should be taught, and which pedagogical approaches are seen as legitimate or desirable in different educational contexts. In a similar way, the textbook analysis showed that textbooks do more than present teaching content; they also reflect deeper assumptions about what counts as knowledge, what forms of reasoning are valued, and how learning should be organised. The teacher survey likewise required an abductive thematic approach because teachers' responses may include both direct statements about teaching practice and more indirect expressions of pedagogical beliefs, assumptions, and constraints. Research on teacher beliefs has shown that such beliefs are often tacit, sometimes unconsciously held, and yet highly influential in shaping classroom practice (Kagan, 1992; Pajares, 1992; Fang, 1996). Across these sources, an abductive approach allowed me to move beyond surface-level mapping or description and interpret the underlying conceptual and pedagogical logics within and across the different datasets, while also relating them to wider theoretical debates on critical thinking, curriculum, and pedagogy. It was also valuable because it provided a coherent way of integrating these qualitative data sources rather than treating them as isolated strands of analysis. The literature reviews mapped the broader conceptual field, the syllabuses offered insight into the formal curriculum, the textbooks showed how critical thinking was framed and operationalised through teaching materials, and the teacher survey added practitioners' perspectives on purposes, methods, and constraints. Analysing all of these through the same abductive thematic approach made it possible to compare where the sources converged, where they differed, and where tensions or contradictions emerged. This strengthened the analysis by

allowing themes to be refined across datasets and by producing a more comprehensive understanding of how critical thinking is conceptualised and taught across different educational contexts.

The choice of abductive approach was therefore guided by four key considerations. First, the literature presents multiple and sometimes competing accounts of critical thinking, which makes it difficult to rely on a single established framework for teaching (Davies, 2013). The purposes, content, and methods remain open to discussion and debate. An abductive approach enables me to integrate existing theories with new insights to gradually construct a more robust and practical theoretical model (Vears & Gillam, 2022). Second, this research compares teaching practices across different cultural and institutional settings, an area marked by considerable diversity and complexity. An abductive approach is suitable for this kind of cross-cultural research, as it effectively captures both the uniqueness and common patterns within the data while drawing from established theories (Tavory & Timmermans, 2014). Third, an abductive approach encourages openness to new findings, allowing me to use established theories as guides without being restricted by them. This flexibility made it possible to respond to unexpected patterns and trends emerging in the research (Tavory & Timmermans, 2014; Vears & Gillam, 2022). Finally, abduction is a form of inference that seeks the best possible explanation for the observed phenomena, generating theories that most plausibly account for surprising or incomplete data. This characteristic aligns with the values of pragmatism, making it well suited to this study.

In this study, the thematic abductive analysis employed the six-step thematic coding protocol proposed by Braun and Clarke (2023) with a modification (3a & 4a) for abductive processes:

1. **Familiarisation** – multiple readings of documents and data to understand content relevant to the research questions.
2. **Initial coding** – systematically identifying and labelling interesting features across the dataset that related to the research question.
3. **Searching for themes** – grouping initial codes into potential themes to identify broader patterns.

   3a. **Iterative theoretical engagement / abductive interpretation** – moving back

and forth between emerging codes, existing theory, and prior literature in order to refine the coding framework, explore unexpected findings, and develop the most plausible explanations.

4. **Reviewing themes** – refining themes by checking their fit with coded extracts and the entire dataset, modifying or discarding them as needed.

   4a. **Further iterative theoretical engagement / abductive interpretation**

5. **Defining themes** – articulating what each theme captures and how it relates to the overall research aim, and giving each theme a concise, informative name.
6. **Writing up** – weaving together thematic analysis, data extracts, and analytic commentary to produce a coherent and well-grounded account.

In the pursuit of transparency and rigour throughout the coding process, coding memos were produced. For each category within the coding scheme of each dataset, I provided explicit definitions of inclusion criteria and clear descriptions of how diverse codes were grouped, thereby reducing the possibility of confusion or misinterpretation (Greenhalgh et al., 2018; Krippendorff, 2018).

To further enhance the robustness of the coding process, initial codes were reviewed by the supervisory committee alongside the data. Following this review, discrepancies were discussed and resolved through consensus, leading to refinements in the coding scheme and helping to identify potential areas of ambiguity (Saldaña, 2021). I also created a chart of the coding process for each dataset, details of which can be found in the appendices. These charts include the data sources, raw data, codes, categories, themes, as well as the definitions and inclusion criteria associated with each category. This made it possible to trace codes back to their sources efficiently and further strengthened the transparency and credibility of the research process (Neuendorf, 2017).

In summary, by employing abductive thematic analysis, this study bridges theory and empirical data, allowing for a nuanced comparison of critical thinking education across diverse cultural contexts. It also makes it possible to integrate multiple sources in a coherent way, strengthening the depth, breadth, and practical significance of the final conclusions.

2.3.2.1 Examination and analysis of course descriptions and syllabuses

Western universities

I began by examining critical thinking courses at Western universities. This process started with a search of the official websites of institutions within the top 100 of the 2024 QS World University Rankings (QS Quacquarelli Symonds, 2023), specifically targeting sections like 'Courses', 'Programs', or 'Academics'. The search terms - 'critical thinking', 'logic reasoning', and 'argument' - were employed to ensure consistency in identifying relevant courses. This included a review of course descriptions and syllabuses from various departments, such as Philosophy, Education, and Cognitive Science.

I initially selected universities ranked in the top 100 of the QS World University Rankings because they are widely recognised for their academic excellence and innovative teaching practices in Western higher education. Focusing on these leading institutions ensured that my analysis captured advanced approaches to critical thinking instruction. Further extending the research, I also included Western MOOC (Massive Open Online Course) platforms in the data collection process. I searched these platforms using the same keywords and gathered information from course descriptions, objectives, and syllabuses. This method helped to obtain a broader perspective on how critical thinking is integrated and taught across different educational environments in Western countries. Finally, I broadened the research by performing a Google search to identify additional universities beyond the QS top 100. I used the query: ('critical thinking' OR 'logic reasoning' OR 'argument') AND ('course outline' OR syllabus OR 'course description').

Course syllabuses were collected from 44 universities: 13 in Australia, 10 in Canada, 7 in the UK, and 14 in the USA. For each case, key contextual information was recorded, including the university name, region, QS World University Rankings (2024), university type, faculty affiliation, course status (compulsory or optional), number of credits, and, where available, the teacher's name and related course description. All available syllabus content was retained for analysis. Further details of the 44 universities are provided in the Appendix D1.

Chinese universities

Following a similar approach to that used for Western universities, I examined the 42 'Double First-Class' (双一流) universities in China. The 'Double First-Class' initiative is a significant educational project launched by the Chinese government, officially known as the 'Construction of World-Class Universities and First-Class Disciplines' (世界一流大学和一流学科建设; Liu et al., 2019b). It aims to elevate Chinese higher education to a world-class level. Just as the QS top 100 universities represent Western academic excellence and advanced educational practices, Double First-Class universities are recognised as benchmarks of superior quality and progressive development within the Chinese higher education system.

The initial phase involved navigating the official websites of these universities. I employed the same method applied to the Western universities. I searched the official websites of selected leading Chinese institutions, specifically examining sections labelled 'Courses', 'Programs', or 'Academics'. Using the identical search terms: 'critical thinking,' 'logic reasoning,' and 'argument', I identified relevant courses across various departments. Any course syllabus or course description that included critical thinking as part of its content was copied directly from the website. All related information was recorded in a document to support qualitative analyses in the next stage. More details can be found in the Appendix E.

I then expanded my research to include Chinese MOOC platforms such as 'Chinese University MOOC' and 'Xue Tang Online', which offer educational content from top universities to a broad audience. MOOCs in China have grown significantly in scale, reaching millions of learners nationwide (Liu et al., 2019a; Shen et al., 2016), and they often replicate on-campus curricula, with many courses featuring the same teachers and content (Cheng et al., 2023). On these platforms, I used the same keywords to search for courses, from which I collected available course descriptions, objectives, and syllabuses. This approach enabled me to gain a richer dataset as it included some universities outside the 'Double First-Class' list. Lastly, I conducted additional Google searches with the same keywords - ('critical thinking' OR 'logic reasoning' OR 'argument') AND ('course outline' OR syllabus OR 'course description') - but in Chinese to identify additional universities

offering related courses in China.

This process resulted in course data from eighteen universities, including ten Double First-Class institutions and eight non-Double First-Class institutions. For each case, I recorded the university name, data source type (for example, course syllabus or course description), teacher's name where available, and the full available content of the course syllabus or course description. Full details of the included institutions and courses are provided in the Appendix E1. As the primary language of instruction in these courses was Mandarin, all collected data were translated into English to support comparability in analysis.

Syllabuses analysis

Next, I analysed the course syllabuses from these 18 Chinese universities and 44 Western universities using abductive thematic analysis. A chart was developed to record the coding process, and details are provided in the Appendix E2. The numerical disparity (44 Western universities versus 18 Chinese universities) can be attributed to several factors. Firstly, the Western sample covers four countries (the UK, the USA, Australia, and Canada), and aggregating data from these nations naturally produces a higher total compared to China. However, even when considering the proportion of universities offering critical thinking courses within each country, China's numbers remain significantly lower. This suggests that critical thinking is not yet as widely integrated into Chinese higher education curricula, and that critical thinking education remains at a relatively early stage of development (Wu, 2022; Zhang et al., 2023; Zhao & Liu, 2022). The results form the basis of Chapter Six.

2.3.2.2 Examining critical thinking textbooks

At the same time, I conducted a thematic analysis of 22 Western textbooks on critical thinking. Textbooks offer detailed content explanations but also implicitly reflect certain educational philosophies and strategies. By analysing these textbooks, I was able to map teaching methods and educational goals across these texts, adding valuable detail beyond the syllabus analyses and deepening my understanding of practical teaching strategies (Bowen, 2009; Harwood, 2017).

Within this design, the textbook analysis focused on Western materials and served a supplementary rather than a matched comparative function. It extended the Western syllabus evidence by providing greater detail on content organisation, sequencing, exercises, and other pedagogical features, and was not used to make direct comparisons between Western and Chinese textbooks. A parallel Chinese textbook corpus was not constructed because identifying a comparable body of material would require separate, context-sensitive inclusion and classification criteria and would constitute a substantial comparative study beyond the scope of the present thesis.

Textbooks were selected based on four criteria, which were obtained through discussions with supervisors. Textbooks that met at least one of the following criteria were eligible for inclusion:

1) Explicitly focused on argument analysis, reasoning, or evaluation as central components of critical thinking.
2) Authored by individuals with recognised academic expertise or extensive practical experience in the field of critical thinking. This ensures the selection of authoritative sources that have significantly shaped the discipline. Authors such as Robert H. Ennis and Diane F. Halpern exemplify this standard, as their work is widely regarded as foundational; they are frequently cited in critical thinking research and referenced in other textbooks.
3) Published in at least a second edition, indicating sustained use.
4) Explicitly recommended or used by at least one critical thinking course syllabus in Western universities or by survey respondents.

Textbook content was analysed using the abductive methods previously mentioned. A chart was developed to record the coding process, and details can be found in Appendix F. The results are presented in Chapter Seven.

2.3.2.3 Online survey of Western university teachers

While the analysis of syllabuses provided important information about the purposes, content, and teaching methods of critical thinking education, it did not fully detail specific teaching

methods and challenges in critical thinking education. Therefore, I developed and conducted an online questionnaire survey of Western university teachers. The questionnaire not only incorporated relevant content derived from the previous analysis of the scoping review and course syllabuses but also addressed details that were not fully captured in those texts. This included course structure, textbook usage, teaching practices, challenges, and recommendations. The survey gathered insights from educators with experience in teaching critical thinking courses, exploring both structural and pedagogical dimensions of their practice. Participants were asked about their current and past involvement in critical thinking courses, the typical student audience, and whether their courses were core or optional. The survey also investigated the use of textbooks, teaching methods, assessments, and the effectiveness of various approaches. Respondents were invited to share any innovative teaching practices, perceived challenges in teaching critical thinking, and their views on the main purposes and value of critical thinking education. Additionally, they were asked to offer advice for new course design and reflect on any further experiences they considered relevant. The online questionnaire was distributed to critical thinking educators in four countries - Australia, Canada, the United Kingdom, and the United States. Specific survey questions can be found in Appendix A5.

To identify potential participants, I conducted a targeted search of Google Scholar and the Elsevier database for publications related to critical thinking and higher education published between 2018 and 2024. This period was chosen to identify teachers who had taught critical thinking courses in recent years. I compiled the corresponding email addresses of paper authors from Australia, Canada, the United Kingdom, and the United States. These four countries were selected because they formed the core national contexts in the earlier syllabus analysis and provided a relevant basis for examining critical thinking teaching in Western higher education. They also offered a practical and linguistically consistent sample for participant recruitment, given the time and resource constraints of the study. Collecting primary data from Chinese university teachers through interviews or questionnaires would have required governmental approvals and access permissions in China that could not be secured by an individual researcher (National Bureau of Statistics of China, 2004). The Chinese component therefore relied on Chinese research, university syllabuses, and national

policy documents. Based on the collected information, I visited the profile pages of these authors. If an author's stated research interests included critical thinking, an email invitation was sent inviting them to participate in the survey. In addition, where teacher email addresses had been identified in the earlier critical thinking syllabus review, these were recorded and used for further invitations. The research received ethical approval from the University of Glasgow before proceeding (see Appendix A1 for the approval letter).

Invitations were sent to 122 potential participants. This online questionnaire-based survey was carried out from January 1 through April 1, 2024. Data were collected using the software platform Qualtrics and included the following questions. There were 28 responses, of which nine were excluded here as the respondents selected 'I have not taught critical thinking', which automatically ended the questionnaire. The remaining 19 valid responses form the basis of Chapter Eight.

2.4 Statement on the use of AI tools

This thesis made limited use of ChatGPT (OpenAI) as a language-support tool for the translation of selected Chinese-language materials into English. The AI-generated translations were used only to support drafting and initial language conversion. All translated content was subsequently reviewed, edited, and verified by the author for accuracy. ChatGPT was also used on a limited basis to assist with language polishing and grammatical checking during the writing process. The Sankey diagram in Figure 3-2 was also produced with the assistance of ChatGPT based on the author's own coded data and analytical decisions. ChatGPT was not used to generate the thesis's original arguments, analysis, or conclusions. The author takes full responsibility for the final wording and interpretation presented in this thesis.

2.5 Methodological discussion

A key strength of the overall design is that the scoping reviews, syllabus and textbook analysis, teacher survey, and Chinese national education policy analysis work together as complementary forms of triangulation rather than as separate methodological tasks. In mixed methods research, triangulation is not only about checking whether similar findings appear

across different sources, but also about using different forms of evidence to build a fuller and more credible understanding of a complex issue (Creswell & Plano Clark, 2018; Fetters et al., 2013). In this study, the scoping reviews in Chapters Three and Four map the conceptual and empirical field, clarifying how critical thinking teaching has been defined and discussed across Western and Chinese scholarship. The abductive thematic analysis of syllabuses, textbooks, and teacher survey responses then shows how these wider ideas are reflected in curriculum documents, teaching materials, and teachers' own accounts of practice. The analysis of Chinese national education policy adds the macro-level institutional and regulatory context that shapes what can be taught, prioritised, and assessed in China. Together, these methods combine breadth with depth: the scoping reviews establish the wider field, the qualitative analysis provides interpretive insight into educational practice, and the policy review situates these findings within broader structural conditions. This integration is a major strength of mixed methods research because it supports complementarity, expansion, and a more complete explanation of the research problem (Greene et al., 1989; Bazeley, 2018). It also aligns with an abductive logic of inquiry, since the different forms of evidence are brought into dialogue with one another to refine interpretation and account for complexity, contradiction, and contextual variation (Timmermans & Tavory, 2012). Consequently, these methods do not only make separate contributions; they also work together to create a multi-layered analytical framework. In this sense, triangulation does not simply confirm findings but also helps provide a thicker and more contextualised account of how critical thinking is understood, organised, and taught across different educational settings (Plano Clark, 2017). This integrated design provides the evidence base for the later course-oriented synthesis and allows Western experience to be interpreted in relation to Chinese educational conditions.

Chapter Three: Scoping review on critical thinking teaching in higher education

3.1 Introduction

Chapter One provided a conceptual overview of critical thinking, highlighting its diverse definitions, associated debates, and its role in higher education. Building on this foundation, this chapter moves from conceptual analysis to empirical synthesis by presenting a scoping review of how critical thinking teaching in higher education is discussed in published studies. The chapter has two objectives: first, to synthesise studies on the purposes, content, and methods of critical thinking education in international universities to establish the current landscape; and second, to identify the teaching priorities and analytical dimensions that will inform the subsequent review of Chinese courses and the later analysis of Western critical thinking course syllabuses. The international patterns identified in this chapter provide a comparative reference point for the later analysis of Chinese materials, rather than a model for direct transfer to Chinese higher education. The final dataset comprised sixty-four peer-reviewed journal articles that met the inclusion and exclusion criteria specified in the Methodology chapter. A complete version of the data chart, including all variables and qualitative excerpts, is provided in Appendix B to enable readers to trace analytic claims to their sources.

3.2 Results

3.2.1 Selection of sources of evidence

Searches were conducted in the Education Resources Information Center (ERIC), Web of Science and Scopus. Search strings (provided in Chapter Two) were developed in consultation with supervisors to maximise coverage and precision. Given the generic versus subject-specific debate introduced in Chapter One, this review limits its scope to stand-alone critical thinking courses. Studies where critical thinking is embedded within a disciplinary curriculum, for example in nursing, business, dentistry, geography or agriculture, are excluded. This decision helps maintain conceptual clarity and allows fair comparison across studies. Stand-alone courses are more likely to define critical thinking explicitly, specify

teaching content such as reasoning and argument analysis, and present critical thinking as a more clearly bounded curricular domain rather than merely an aspect of learning development. A separate review of embedded approaches is identified as an important direction for future work.

All final searches were completed in November 2025. The three databases returned 16,176 records (Scopus 5,834; Web of Science 4,936; ERIC 5,406). After removing 5,140 duplicates, 11,036 records proceeded to title-and-abstract screening. Of these, 10,373 were excluded, leaving 663 records for preliminary eligibility checks. Ninety-five records were then removed (51 non-English, 37 not retrievable, 4 with China as the study setting to be addressed in the next section, and 3 not peer reviewed), resulting in 568 articles for full-text assessment. Full-text screening excluded 504 articles (328 in which critical thinking was embedded within other disciplines, 161 that did not address the purposes, content, or methods of teaching critical thinking, 12 that were not situated in higher education, and 3 that were not in English), yielding a final sample of 64 peer-reviewed articles. A PRISMA-ScR flow diagram is presented in Chapter Two.

3.2.2 Study characteristics

The 64 included studies span 17 countries. Most publications originate from the United States (n = 25; 39%) and Australia (n = 12; 19%). A second group comprises the United Kingdom, Turkey, Saudi Arabia and Portugal, with three studies each (5%). Canada, Spain, Ireland and Morocco contribute two studies each (3%), while Jordan, Malaysia, Nigeria, Oman, Romania, Russia and Ukraine are each represented by a single study (2%). Together, the United States and Australia account for 58% of the evidence base, which may reflect the institutional status of critical thinking as a formal curricular requirement in these two areas. In the United States, many state-level general education frameworks explicitly mandate stand-alone critical thinking or reasoning courses within undergraduate degree structures (Halpern, 1998; Fliegel & Holland, 2013; Roberts, 2020). Similarly, Australian universities incorporate critical thinking as a core graduate attribute, leading to first-year foundation-level critical thinking or informal logic courses becoming common components of degree programmes (Twardy, 2004; Davies, 2019; Manning, 2024). In contrast, contexts where

critical thinking is valued but not formally codified in curriculum policy (e.g., Morocco, Oman, Nigeria) tend to exhibit fewer and more localised stand-alone critical thinking courses (Chouari, 2016; Adeyemi, 2012; Al-Naabi et al., 2021).

In terms of research design, 34 studies (53%) are empirical and 30 (47%) are theoretical or conceptual. Earlier publications from the late 1980s through the 2000s predominantly focused on conceptual clarification, including definitional work and debates regarding whether critical thinking is domain-general or discipline-specific, and whether it should be taught as a stand-alone course (e.g., Bailin et al., 1999b; Walters, 1990; Davies, 2006; Robinson, 2011). In contrast, publications from 2010 onwards more frequently report empirical evaluations of course structure and learning outcomes, often using pre-/post-test designs with standardized critical thinking instruments such as the California Critical Thinking Skills Test (CCTST), California Critical Thinking Disposition Inventory (CCTDI), Halpern Critical Thinking Assessment (HCTA), or performance-based assessments (e.g., Blattner et al., 2002; Nieto & Saiz, 2008; Al-Nadi, 2022; Temel, 2022; Roberts, 2020). This temporal shift reflects a movement from debates about whether critical thinking should be taught as a stand-alone course toward examining how such courses are designed and how effective they are in practice.

Studies were published between 1989 and 2025. As shown in Figure 3-1, 64.1% were published from 2010 onwards and 42.2% from 2016 onwards, indicating increasing scholarly attention to stand-alone critical thinking instruction over recent years. This growth aligns with broader movements linking critical thinking to employability, academic success and societal participation, as observed in higher education policy frameworks across North America, Australia and the European Higher Education Area (Cruz et al., 2019; Dumitru & Halpern, 2023).

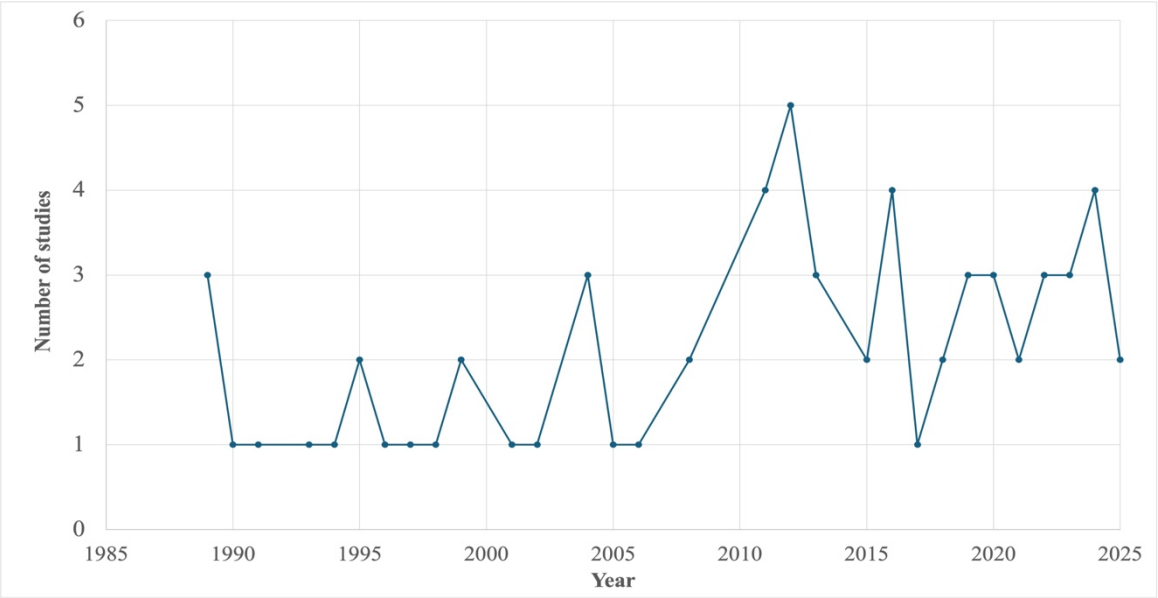

Figure 3-1 Publication timeline of included studies in the scoping review (n = 64)

3.2.3 Findings

Across the included studies, 19 themes were identified across the three dimensions of teaching purposes, teaching content, and teaching methods. Specifically, seven themes were identified under teaching purposes (Develop Analytical Skills; Enhanced Learning; Better Decision Making; Develop Critical Thinking Dispositions; Civic Engagement; Develop Creativity; Effective Communication), seven under teaching content (Argument Analysis; Critical Thinking Dispositions as Content; Problem Solving; Fallacies; Dialogue and Communication as Content; Foundations and Importance of Critical Thinking; Academic Development), and five under teaching methods (Active Learning; Oral Learning; Written Learning; Collaborative Learning; Technology-Enhanced Learning).

The three dimensions of teaching purposes, teaching content, and teaching methods are connected rather than separate pedagogical elements. The Sankey analysis (Figure 3-2) shows that critical thinking instruction in higher education generally follows a recurring pattern in which specific teaching purposes are operationalised through forms of teaching content and are then enacted through corresponding methods. The width of each flow represents the frequency with which a given Purpose-Content-Method combination appears jointly within the included studies. Figure 3-2 shows that teaching purposes emphasising the development of analytical skills are commonly associated with teaching content centred on

argument analysis, which is most often implemented through active learning approaches. To clarify these findings, the following sections examine each theme in turn, outlining its frequency, proportion, and conceptual meaning.

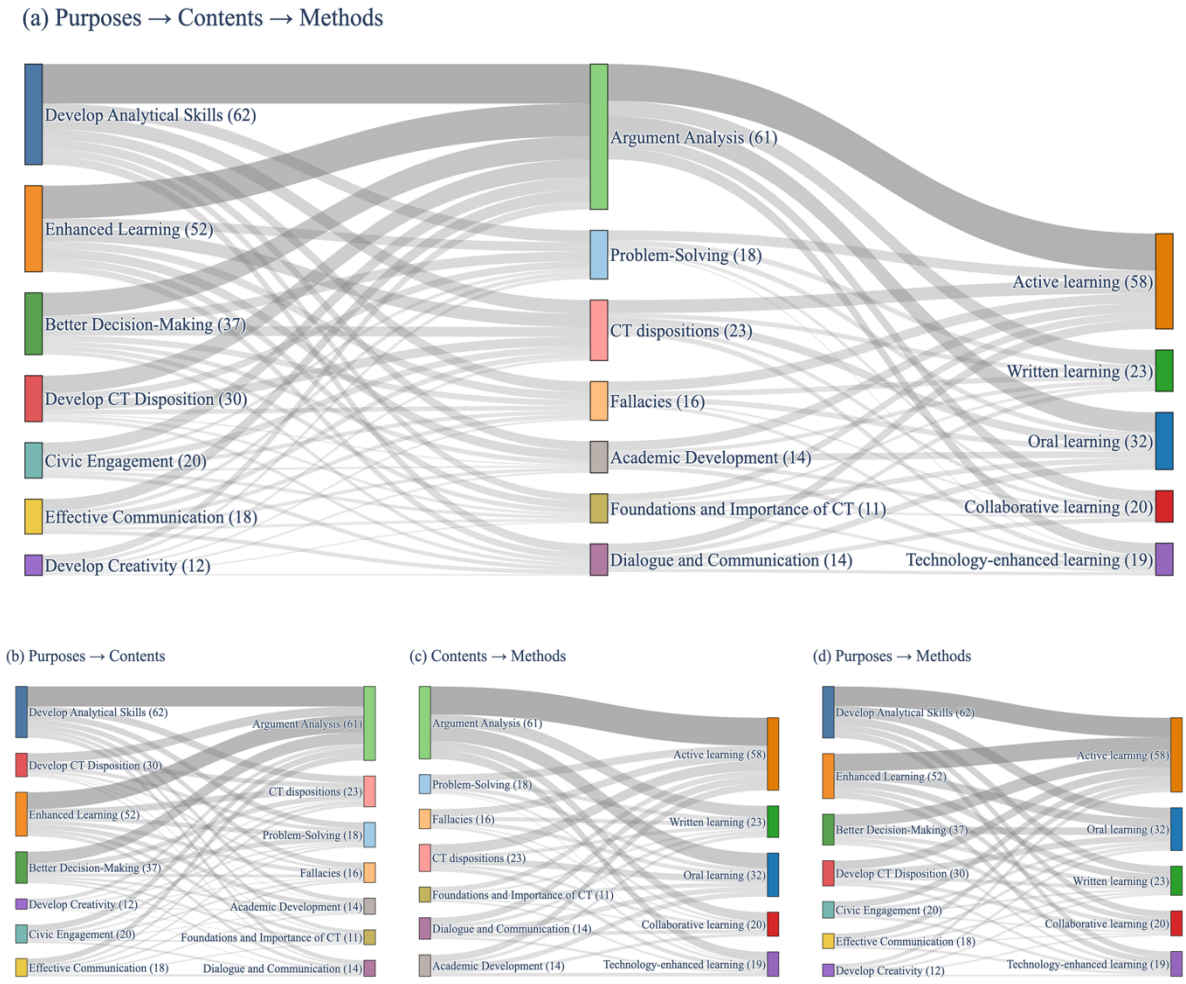

Figure 3-2 Sankey map of the purposes, content, and methods of teaching critical thinking (n = 64)

3.2.3.1 Teaching purposes

The thematic analysis identified seven purposes for teaching critical thinking in higher education. Table 3-1 presents the frequency and proportion of each identified teaching purpose. Develop Analytical Skills (62 studies, 97%) and Enhanced Learning (52, 81%) were the most frequently reported purposes, followed by Better Decision Making (37, 58%). Nearly half of the studies (30, 47%) also emphasised the development of critical thinking dispositions, while Civic Engagement (20, 31%), Effective Communication (18, 28%), and

Develop Creativity (12, 19%) were less common but still noteworthy. This distribution indicates that most critical thinking education initiatives in higher education prioritise cognitive and reasoning goals, with a secondary focus on dispositions, civic engagement, enhanced communication, and creativity.

Table 3-1 Frequency of purposes for teaching critical thinking in higher education

Theme	Number of Studies (n = 64)	Percentage (%)
Develop Analytical Skills	62	97%
Enhanced Learning	52	81%
Better Decision Making	37	58%
Develop Critical Thinking Dispositions	30	47%
Civic Engagement	20	31%
Effective Communication	18	28%
Develop Creativity	12	19%

In the following, each theme is explained in detail, illustrating how it was articulated within the included studies and how it contributes to an overall understanding of the purpose of teaching critical thinking.

Develop Analytical Skills: The aim of developing analytical skills refers to cultivating students' capacity for logical reasoning, argument analysis, and evidence-based judgement. Among the 64 studies included in this review, 62 explicitly mentioned this purpose, indicating its central importance in critical thinking education. Halpern (1998) identifies the enhancement of analytical and reasoning skills as the primary objective of higher education. Ikuenobe (2001) defines the key learning outcomes of critical thinking instruction as students' ability to analyse ideas and issues, evaluate knowledge and information, underscoring analysis and evaluation as explicit educational aims.

Enhanced Learning: This theme highlights the aim of critical thinking to foster academic success, autonomous learning, and lifelong intellectual development. This teaching purpose

was identified in 52 out of the 64 studies. Ahuna et al. (2010) reported that a Methods of Inquiry course grounded in critical thinking explicitly taught students to reflect on and evaluate their own learning processes, thereby enabling them to become autonomous learners capable of directing their academic progress. Goh (2012) argues that the purpose of critical thinking instruction is to develop students' ability to employ evidence-based reasoning, make critical judgements, and engage in reflective inquiry, thereby enhancing their academic achievement and capacity to solve problems. Alwehaibi (2012) emphasised critical thinking as a lifelong learning competency that shapes how students acquire, interpret, and apply new knowledge within and beyond formal education.

Better Decision Making: This theme refers to the purpose of helping students use critical thinking to make reasoned and responsible choices in everyday, civic and professional contexts. The theme captures the applied dimension of critical thinking education, in which students learn to act thoughtfully and make informed, reflective decisions (e.g. relatively free from bias and fallacious reasoning) that are appropriate to real-world circumstances. Among the 64 studies, 37 identified Better Decision Making as a key teaching purpose. As Bassham and Nardone (1997) observe, one of the most important challenges in critical thinking education is to demonstrate its practical relevance, showing students that reasoning abilities can make a real difference in personal and public decision-making. For example, an aim of critical thinking learning is for students to develop the capacity to evaluate situations from multiple perspectives, weigh alternative options, and anticipate possible consequences before making decisions (Cargas, 2016).

Develop Critical Thinking Dispositions: This theme focuses on developing students' emotional and attitudinal qualities, helping them build critical thinking habits of mind. Among the 64 studies, 30 identified Develop Critical Thinking Dispositions as a key teaching purpose. The dispositions emphasised in these studies broadly correspond to the categories discussed in Chapter One. They include truth-seeking and fair-minded judgement (Adeyemi, 2012; Hopkins & Richardson, 1989), open-mindedness and perspective-taking (Cruz et al., 2019; Cargas, 2016; Aston, 2024), and intellectual humility (Ferkany et al., 2023; Heersmink, 2018). Cultivating critical thinking dispositions is presented as an important part

to critical thinking education as it helps achieve other teaching purposes such as developing analytical skills, enhancing learning, better decision making, and civic engagement. At the same time, these intellectual virtues are also valued beyond their instrumental contribution to other outcomes. As Lipman (1988) suggests, critical thinking education is connected not only with Problem Solving and decision-making, but also with 'the cultivation of wisdom' (p. 38), and students should be encouraged to 'become reasonable for their own good … as a step toward their own autonomy' (p. 43).

Civic Engagement: Civic Engagement refers to helping students develop a sense of social and civic responsibility through critical thinking education. This theme highlights how critical thinking aims to encourage learners to take an active and responsible role in democratic life, to understand issues of social responsibility and public issues through evidence-based reasoning, and to examine social problems through evidence and logical reasoning. Among the 64 studies, 20 explicitly linked critical thinking with civic engagement. These studies indicate that critical thinking should guide students toward ethical awareness and social responsibility by strengthening their reasoning and communication skills and cultivating intellectual dispositions such as open-mindedness and fair-minded judgement (Bailin et al., 1999a; Murray, 2015; Franco, 2016). The idea is that through critical thinking, learners are encouraged to analyse public issues using evidence-based reasoning (Bailin et al., 1999a; Franco, 2016). Moreover, critical thinking is promoted as having the potential to serve as a safeguard against propaganda, misinformation, and manipulation on social media, strengthening citizens' ability to think rationally and act with integrity (Bassham & Nardone, 1997; Alotaibi & Ismail, 2024). While linking critical thinking to civic engagement underscores its broader social relevance, such an interpretation may risk extending the scope of critical thinking toward critical theory. This issue will be discussed further in the discussion section.

Effective Communication: This theme focuses on the aim of helping students develop the ability to express their ideas with clarity, logical coherence, and persuasive reasoning. Among the 64 studies, 18 mentioned Effective Communication. In these studies, communication is explicitly identified as an essential graduate outcome highly valued by

employers (Cargas, 2016; Horenstein et al., 2011; Giselsson, 2020). Critical thinking courses are often designed with explicit goals to cultivate 'virtues of discourse,' encouraging learners to participate actively and responsibly in academic, professional, and civic communities (Alfino et al., 2008).

Develop Creativity: This refers to the aim of using critical thinking education to enhance students' imagination, originality, and cognitive flexibility, enabling them to generate multiple solutions, reconstruct and integrate ideas, and propose innovative yet appropriate responses in diverse contexts. Among the 64 studies, 12 identify creativity development as a teaching purpose of critical thinking education. Some studies position creativity as a key learning outcome of critical thinking courses and establish course objectives and assessment criteria accordingly (Reid & Anderson, 2012; Hannon et al., 2004; Goh, 2012). For example, Reid and Anderson (2012) explicitly state that one aim of their course is to 'foster creativity by encouraging students to generate original ideas and explore alternative ways of thinking', and Hannon et al. (2004) similarly note that creativity is 'embedded in the learning outcomes', requiring students to demonstrate flexible and innovative responses in assessments. Some studies also emphasise helping students move from analysing arguments to finding creative ways to solve problems, thereby highlighting a shift from knowledge acquisition to innovative application (Ikuenobe, 2001). As Ikuenobe (2001) explains, critical thinking 'should not stop at analysing arguments' but should also enable students to 'reconstruct ideas creatively and apply them in novel problem situations'. Taken together, these studies reflect the view that critical thinking and creativity are complementary processes, in which reflective judgement and open-minded exploration enable students to approach problems in novel ways, think beyond established boundaries, and apply creative solutions in academic and real-world contexts. However, critical thinking and creative thinking remain distinct in nature, and the discussion section will consider further how to avoid conflating the two.

3.2.3.2 Teaching content

As shown in Table 3-2, seven themes were identified as the teaching content areas of critical thinking education. Argument Analysis (61 studies, 95%) was the most dominant content

theme, reflecting that critical thinking instruction in higher education predominantly focuses on developing students' ability to identify arguments, evaluate arguments and reconstruct arguments. Other recurrent themes included Critical Thinking Dispositions as Content (23, 36%) and Problem Solving (18, 28%), indicating that many courses also address the attitudinal and broader applications of critical thinking. Less frequently, studies emphasised Fallacies (16, 25%), Dialogue and Communication as Content (14, 22%), Academic Development (14, 22%), and Foundations and Importance of Critical Thinking (11, 17%).

Table 3-2 Frequency of content themes used in teaching critical thinking in higher education

Theme	Number of Studies (n = 64)	Percentage (%)
Argument Analysis	61	95%
Critical Thinking Dispositions as Content	23	36%
Problem Solving	18	28%
Fallacies	16	25%
Dialogue and Communication as Content	14	22%
Academic Development	14	22%
Foundations and Importance of Critical thinking	11	17%

The following sections explain each theme, detailing how it emerged within the reviewed literature and how it shapes the content of critical thinking teaching.

Argument Analysis: This theme is the most common theme, appearing in 61 of the 64 studies. It represents the focus of teaching content where students learn to understand, identify, reconstruct and evaluate arguments. Many studies emphasise the importance of distinguishing premises, conclusions, assumptions, and propositions to understand the internal logic of arguments (Davies, 2006; Walters, 1989; Harrell, 2011). Instruction commonly focuses on both deductive and inductive reasoning, as well as causal and probabilistic inference, allowing learners to judge the strength and validity of conclusions (Halpern, 1998, 1999; Ikuenobe, 2001; Anderson, 2005). A substantial number of studies

emphasise the analysis of arguments across academic, professional, and everyday contexts, where students apply logical reasoning to test hypotheses, evaluate correlations and causation, and reason under uncertainty (Halpern, 1998; Nieto & Saiz, 2008). Practical content such as argument mapping and diagramming is widely used to help learners visualise reasoning and evaluate evidence (Twardy, 2004; Ahmed, 2018). This theme shows that argument analysis is the core of critical thinking teaching, providing students with structured tools for reasoning and evidence-based judgement.

Critical Thinking Dispositions as Content: Dispositions appear in 23 studies, highlighting the centrality of fostering intellectual virtues as well as reasoning skills. The content focuses on teaching dispositions such as open-mindedness, inquisitiveness, truth-seeking, and fair-mindedness, which guide the responsible use of reasoning (Temel, 2022; Ferkany et al., 2023). Students are taught to reflect on their own thinking processes and regulate emotions in reasoning, developing self-awareness and intellectual humility (Dienichieva et al., 2021; Franco, 2016). Some studies explicitly present critical thinking as both cognitive skills and dispositional development, aligning with Ennis's and Facione's frameworks, which view critical thinking as reasonable, reflective thinking guided by intellectual virtues (Horenstein & Niu, 2011; Dumitru & Halpern, 2023).

Problem Solving: Problem Solving appears as a content area in critical thinking education in 18 studies, linking critical thinking to decision-making and reasoning in uncertain or complex contexts. Although 18 studies explicitly identify Problem Solving as part of the content of critical thinking education, the boundary of this theme remains rather vague, often overlapping with other content areas such as argument analysis. For instance, in Halpern's (1998) theory, identifying, comparing, and evaluating alternative solutions are embedded within the process of argument evaluation, where students weigh competing explanations and evidence to reach a reasoned conclusion rather than treating this as a separate Problem Solving task. Whether it should therefore be regarded as a distinct content area warrants further discussion. Here, it is presented primarily to illustrate how the included studies address this theme.

Many studies emphasise defining problems clearly, generating alternative solutions, and making evidence-based decisions through logical reasoning (Halpern, 1998, 1999; Olivares et al., 2013). Students are often introduced to causal reasoning, hypothesis testing, and likelihood estimation as part of a structured approach to understanding problems (Anderson, 2005; Reid & Anderson, 2012). In several studies, Problem Solving content also includes metacognitive monitoring, through which students check their progress in working through a problem, reassess the adequacy of alternative solutions, and evaluate the soundness of the conclusions they reach (Halpern, 1999). Problem Solving is typically taught through concrete cases, since identifying, analysing, and resolving a problem necessarily requires some particular context in which alternative courses of action can be considered. In this literature, such contexts are often social, environmental, or ethical in character. However, these contexts generally function less as distinct substantive content areas in their own right than as problem situations through which students practise evidence-based reasoning, comparison of alternatives, and justified decision-making. At the same time, their use also points back to a broader issue identified in Chapter One, namely that critical thinking instruction often depends upon some degree of subject- or context-specific knowledge, even where the educational aim is to develop more general reasoning capacities. For example, Hanley (1995) uses environmental policy questions as contexts for evaluating alternative courses of action, while Crow (1989) draws on social issues such as inequality and policy decision-making to develop students' evidence-based reasoning in civic contexts.

Fallacies: This theme is included in 16 studies. Learners are introduced to formal and informal fallacies, such as ad hominem arguments, hasty generalisations, false cause, and appeal to emotion, to recognise flawed reasoning (Davies, 2006; Robinson, 2011; Hopkins & Richardson, 1989). Some studies also explore fallacies through modern communication forms, showing how poor reasoning can appear in mass media, advertising, or online discussions (Bassham & Nardone, 1997; Giselsson, 2020). As is to be expected, understanding fallacies is frequently connected to evaluating argument strength, validity, and soundness (Ikuenobe, 2001; Alfino et al., 2008).

Dialogue and Communication as Content: This theme emerges in 14 studies, where

critical thinking teaching focuses on reasoned discussion, exchange of arguments, and clarity in expressing ideas. The emphasis is on developing students' ability to articulate ideas logically, evaluate competing viewpoints, and respond to arguments with evidence and coherence (Ahmed, 2018; Robertson & Rane-Szostak, 1996; Chouari, 2016). Critical thinking was also framed as a discursive practice, involving critical dialogue and ethical communication across perspectives, which entails engaging respectfully with the viewpoints and communicative styles of others (Goumaa & Anderson, 2024; Cargas, 2016).

Academic Development: Academic development appears in 14 studies, linking critical thinking content to students' engagement with academic literacy, research, and scholarly communication. Many studies described critical thinking as the foundation for critical reading, argument-based writing, and academic reasoning (Bilki & Irgin, 2022; Chouari & Nachit, 2016). Students were taught to analyse texts, evaluate essays, and synthesise information from multiple readings to produce structured and persuasive writing (Ahmed, 2018; Carmichael & Farrell, 2012).

Foundations and Importance of Critical Thinking: This theme appears in 11 studies, focusing on the conceptual and philosophical underpinnings of critical thinking. The content often includes definitions, theoretical models, and discussions of the relevance of critical thinking to higher education and professional life (Horenstein & Niu, 2011; Franco, 2016). Several frameworks were introduced to give students a structured understanding of critical thinking, such as Ennis's taxonomy of abilities and dispositions, Paul and Elder's elements of thought, and Facione's Delphi model (Cruz et al., 2019; Franco, 2016) (these models can be found in Chapter One). Some sources also explore the historical and cultural foundations of critical thinking. For instance, Egege and Kutieleh (2004) discuss how Western logical traditions such as Socratic questioning contrast with Confucian educational values in multicultural teaching context. They note that many international students 'come from educational traditions that privilege deference to authority over open questioning,' which affects how they engage with critical thinking activities. Alfino et al. (2008) further linked critical thinking to ethical dimensions of enquiry, highlighting intellectual honesty, open-mindedness, and respect in discourse as integral to critical reasoning, arguing that 'critical

thinking is inseparable from the moral virtues that make dialogue possible.'

3.2.3.3 Teaching methods

Before presenting the distribution of teaching methods, it is worth noting that published studies often report pedagogical practices that authors regard as distinctive, innovative, or analytically relevant, rather than documenting every routine component of a course. This means that the reported frequencies reflect what authors considered distinct or innovative enough to discuss, rather than what is universally implemented in higher education. For example, although only 36% of the studies mention written learning, writing is almost certainly a standard component of most critical thinking courses. As shown in Table 3-3, five major teaching methods were identified from the 64 included studies. Active Learning (58 studies, 91%) was the most dominant approach, highlighting that critical thinking instruction in higher education relies on interactive and participatory learning activities. Other widely adopted methods include Oral Learning (32, 50%) and Written Learning (23, 36%), which emphasise the articulation and organisation of reasoning through dialogue and writing. Collaborative Learning (20, 31%) and Technology-Enhanced Learning (19, 30%) were also frequently reported, indicating that interaction among peers and the use of digital tools are recognised as valuable means of supporting critical thinking development.

Table 3-3 Frequency of methods used to teach critical thinking in higher education

Theme	Number of Studies (n = 64)	Percentage (%)
Active Learning	58	91%
Oral Learning	32	50%
Written Learning	23	36%
Collaborative Learning	20	31%
Technology-Enhanced Learning	19	30%

The following sections discuss each teaching method in detail.

Active Learning: Active learning is the most common teaching approach associated with critical thinking, appearing in 58 studies. It refers to forms of teaching in which students are

expected to engage actively in reasoning and judgement, rather than mainly receive information from the teacher. In the reviewed studies, this appears in several distinguishable forms. Problem-based learning organises learning around a relatively complex problem through which students learn by working towards a solution, often in situations where there is no single correct answer (Hmelo-Silver, 2004). Inquiry through questioning, by contrast, advances learning through sequences of questions that probe assumptions, reasons, and evidence, without necessarily being structured around one extended problem task (Hmelo-Silver et al., 2007). Case-based activities centre on the analysis of a specific case, scenario, or narrative example, using that case as the basis for discussion, judgement, and interpretation (Herreid, 2005). Experiential tasks emphasise learning through direct participation in an activity or situation, reflecting the view that knowledge is developed through the transformation of experience (Kolb, 1984). What these approaches share is an emphasis on students doing the intellectual work themselves, but they differ in terms of what the learning is organised around.

Problem-based and inquiry-based learning are the clearest examples of this theme. In Olivares et al. (2013), students worked on real and complex problems and wrote their reflections in logbooks. Similarly, Adeyemi (2012) describes activities where teachers asked open-ended questions to make students think more deeply. These methods are part of active learning because they ask students to explore ideas, test evidence, and make their own judgements instead of just working with what others have said. In other examples, Reid and Anderson (2012) use real cases to help students practise reasoning, and Al-Naabi et al. (2021) combine short instructional videos introducing weekly critical thinking skills with quizzes and online discussions to engage students actively in digital learning spaces. Active learning helps make students' thinking visible and open to examination through practice, discussion, and feedback. Such methods are widely used across subjects, as most disciplines expect students to think critically in subject-specific ways. In the studies reviewed here, however, they are typically justified in terms of their relevance to critical thinking. For example, when students analyse problems, compare different viewpoints, or receive feedback, they are encouraged to question their own ideas and understand how to reason more clearly (Halpern, 1999). The aim is that this ongoing process of practice and reflection helps them form habits

of logical thinking and self-evaluation.

Oral Learning: Oral learning appears in 32 studies. It focuses on speaking, listening, and discussion as ways to build reasoning skills. In this method, the aim is for students to express their ideas, listen to others, and respond thoughtfully. The rationale is that talking and listening helps students make their thinking clear and open to feedback. It includes different forms such as Socratic dialogue, structured debate, guided discussion, oral feedback, and group dialogue. All these forms use spoken interaction with the goal of helping students practise reasoning and reflection.

Adeyemi (2012) describes teachers who use the Socratic method, asking students a series of questions to guide them towards deeper understanding. In other cases, students took part in formal debates where they argue for or against a position, as shown in Sanders et al. (1994). Students need to explain their views, answer challenges, and think on the spot. Oral feedback, as used by Keeley et al. (1995), further supports learning by helping students correct mistakes immediately through dialogue. The rationale is that oral learning turns thinking into an active and visible process. When students speak, they need to choose words that clearly show their reasoning. This helps them notice gaps, unclear logic, or weak evidence in their own arguments. At the same time, hearing other people's ideas exposes them to different perspectives, which encourages open-mindedness and fairness in judgement. The quick and interactive nature of speaking also gives instant feedback, allowing students to test and adjust their arguments in real time.

Written Learning: Written learning appears in 23 studies. This is not in itself distinctive, since writing is common in most university courses. More noteworthy is the way writing is used here to support critical thinking, especially through argumentative essays, reflective journals, and analytical reports that help students identify, reconstruct, and evaluate arguments. In these activities, students are expected to present claims, support them with evidence, and sometimes revise their thinking through feedback.

Bilki and Irgin (2022) describe a critical reading and writing course where students produce

analytical and argumentative essays to combine ideas from different sources. Similarly, Hopkins and Richardson (1989) ask students to analyse and evaluate arguments through structured written exercises, including diagramming and flowchart writing. Reflective journals, such as those used in Hanley (1995), also encourage students to monitor their own thought processes and recognise how their reasoning develops over time. Across these examples, writing functions not only as a means of communication but also as a way of making reasoning explicit and open to revision. Through drafting and revising, students can identify weaknesses in their arguments and learn to support their claims more effectively, while moving between analysing texts and producing their own writing develops habits of careful judgement, logical structure, and self-reflection (Bilki & Irgin, 2022).

Collaborative Learning: Collaborative learning appears in 20 studies. It involves students working together in pairs or groups to discuss ideas, explore issues, and evaluate arguments. Through cooperation, the aim is for students to learn not only from their own reasoning but also from the perspectives and challenges offered by others. This method includes different forms such as group projects, peer review and cooperative inquiry. Students share responsibility for thinking critically and supporting their conclusions with evidence. Although collaborative learning may overlap with oral learning in its use of discussion, the focus here lies not only on dialogue itself but also on cooperation and joint construction of understanding. Whereas oral learning emphasises the articulation of thought through dialogue, collaborative learning centres on shared viewpoints, mutual feedback, and the co-development of arguments and decisions. In critical thinking education, this cooperative process aims to transform reasoning into a collective activity, helping students learn how critical reflection functions within a community of inquiry rather than in isolation.

In the studies reviewed, Robertson and Rane-Szostak (1996) describe students who worked in small groups to write and act out dialogues, analyse reasoning errors, and reflect on group performance. Similarly, Cruz et al. (2019) promoted structured cooperative learning and peer review to improve critical thinking skills, highlighting the value of discussion and collective reflection. Group projects and debates, as reported by Bassham and Nardone (1997), aim to encourage students to research complex issues and defend their arguments as a team. These

activities rely on interaction and shared analysis, with the intention of allowing learners to test ideas against differing viewpoints and strengthen their reasoning through dialogue. The idea is that working in groups helps students to explain their ideas clearly and to listen actively to others. This creates a need for students to justify their reasoning in ways that others can understand, which may in turn make flaws or gaps in their logic more visible. It also seems reasonable to suggest that such collaborative work may support not only stronger analytical skills but also strengthen dispositions such as open-mindedness and deliberative friendliness (Aikin & Clanton, 2010).

Technology-Enhanced Learning: Technology-Enhanced Learning appears in 19 studies and refers to the use of digital tools, online platforms, and multimedia resources to support the teaching and practice of critical thinking. It includes online discussion boards, videos, quizzes, and collaborative digital environments that encourage students to think actively rather than consume information passively. The focus of this approach is not only on convenience or access but on how technology can create new spaces for reasoning, feedback, and reflection.

Al-Naabi et al. (2021) designed an online course combining short instructional videos, discussion forums, and quizzes to guide students through cycles of learning, practice, and self-assessment. Carmichael and Farrell (2012) described an interactive Blackboard site containing multimedia resources, quizzes, and discussion boards that allowed students to apply critical thinking strategies and reflect through journal entries. Goh (2012) used wikis as a platform for collaborative argumentation, where students compared and challenged each other's ideas in shared online spaces. Technology-Enhanced Learning can extend dialogue and reflection beyond the physical classroom across many subject areas. In the studies reviewed here, however, these tools were used specifically to support critical thinking activities such as questioning claims, comparing perspectives, responding to peers' arguments, and constructing evidence-based responses. Digital forums and online discussions enabled sustained engagement with ideas, allowing students to revisit issues, respond asynchronously, and refine their reasoning over time. This extended interaction may support deeper analysis by giving learners more opportunity to consider alternative

viewpoints and formulate more carefully reasoned responses.

3.2.3.4 Summary

Among the 64 studies included, research on stand-alone critical thinking courses has shown a gradual increase in recent years. Of all publications, 64.1% appeared after 2010 and 42.2% after 2016, reflecting growing attention to critical thinking as an independent area of instruction. However, despite this growth, studies focusing exclusively on stand-alone critical thinking courses remain relatively few compared with those embedding critical thinking within disciplinary or skills-based contexts. This pattern suggests that, while the explicit design of critical thinking curricula has become more common, most higher education programs continue to integrate critical thinking instruction within subject-specific courses such as education, nursing, business, and engineering. This may reflect the broader tendency in higher education research to examine critical thinking in relation to disciplinary teaching or transferable academic skills, rather than as a fully separate subject. Since the present review focuses only on stand-alone critical thinking courses, this point is noted cautiously and would need to be examined more fully through comparison with the wider literature on embedded critical thinking instruction.

The geographical distribution of studies also reveals a strong concentration in two national contexts. The United States (25 studies, 39%) and Australia (12 studies, 19%) together account for 58% of the total sample. These two countries not only dominate numerically but also contribute substantially to the range of teaching purposes, content areas, and teaching methods identified in the review. Other regions, including the United Kingdom, Turkey, Saudi Arabia, and Portugal (three studies each, 5%), as well as Canada, Spain, Ireland, and Morocco (two studies each, 3%), contribute smaller portions of the evidence base. The remaining countries (Jordan, Malaysia, Nigeria, Oman, Romania, Russia, and Ukraine) are represented by single studies (2%). This pattern may be associated with both the historical development of the field and the degree of policy support for critical thinking in different higher education contexts. Contemporary stand-alone critical thinking instruction has been most visibly developed in North America, especially in the United States, which has had a major influence on the field's teaching models and research traditions. At the same time, the

explicit recognition of critical thinking within higher education policy and curriculum frameworks in the United States (Halpern, 1998; Fliegel & Holland, 2013; Roberts, 2020) and Australia (Twardy, 2004; Davies, 2019; Manning, 2024) appears to have created favourable conditions for the growth of stand-alone provision. This suggests that the development of critical thinking education is shaped not only by pedagogical ideas, but also by policy support and curriculum structures. This highlights the importance of examining whether and how Chinese higher education policy articulates a demand for critical thinking.

In the coding process, several high-frequency themes emerged across the dimensions of teaching purposes, teaching content, and teaching methods. Within teaching purposes, Develop Analytical Skills appeared in 62 studies (97%); within teaching content, Argument Analysis appeared in 61 studies (95%); and within teaching methods, Active Learning also appeared in 58 studies (91%). These three themes had the highest occurrence rates in their respective dimensions, indicating that critical thinking instruction in higher education primarily focuses on developing students' analytical abilities, understanding and evaluating arguments, and fostering critical engagement through participatory learning activities. Closely related themes included Enhanced Learning (52 studies, 81%), Better Decision Making (37 studies, 58%) and Oral learning (32 studies, 50%), which together formed the higher-frequency cluster and showed that these pedagogical ideas are widely adopted in critical thinking teaching.

The relatively low occurrence of certain themes may have several explanations. In some cases, the core concepts of these themes may have been embedded within other dimensions. For example, Academic Development appeared only 14 times (22%) in teaching content, but its underlying ideas may already be reflected in the teaching purposes of Enhanced Learning (81%) or Develop Analytical Skills (97%). In other cases, some themes may have been too fundamental or widely accepted to be explicitly emphasised. For instance, Foundations and Importance of Critical Thinking appeared in only 11 studies (17%) within teaching content, possibly because it is considered a foundational element that authors did not feel it necessary to state it explicitly.

Other low-frequency themes included Develop Creativity (12 studies, 19%) within teaching purposes, and Technology-Enhanced Learning (19 studies, 30%) within teaching methods. Although these appeared less often, they complement the dominant themes by providing more specific perspectives on teaching purposes, teaching content, and teaching methods. The lower frequencies simply indicate that these themes were mentioned less frequently across the included studies; they do not imply lower value or significance. This is especially true of technology-enhanced learning, whose relevance is likely to increase further as generative AI becomes more common in higher education teaching and learning. These categories therefore provide useful reference points for future curriculum design and pedagogical planning.

While low-frequency themes are not unimportant, the high occurrence of several dominant themes and their alignment across dimensions reveal a notable pattern. Analytical Skills (97%) in teaching purposes, Argument Analysis (95%) in teaching content, and Active Learning (91%) in teaching methods appeared in almost identical proportions and showed strong functional correspondence. Teaching purposes emphasised reasoning, judgement, and evidence evaluation; teaching content offered the conceptual and procedural frameworks to achieve these goals; and teaching methods operationalised them through participatory activities that allowed students to apply and test their thinking in practice. Together, these three dominant themes form an integrated system that connects purposes, content, and methods, each covering more than 90 percent of the reviewed studies. This high level of consistency suggests that critical thinking instruction in higher education often displays a recurrent pedagogical pattern centred on argument analysis, with active learning frequently serving as the primary mode of implementation. This alignment is one of the most distinctive features identified in the dataset and suggests a shared orientation across studies in how critical thinking is designed and taught.

3.3 Discussion

The scoping review revealed several recurring yet conceptually contested themes within the literature. Among the 64 studies analysed, three themes - Civic Engagement, Develop Creativity, and Problem Solving - appeared in a notable minority of studies and displayed

overlapping boundaries with other critical thinking purposes and contents. These themes often extend the scope of critical thinking beyond its core dimensions, creating theoretical ambiguity and vagueness. I discuss them here to explain why they are considered unclear and why there is debate about whether they should be part of critical thinking. In the later analyses of course syllabuses, textbooks, and teacher surveys, I will also keep similar themes in the data to remain true to the original sources. At this stage, the aim is not to exclude these themes from the dataset, but to clarify their conceptual status and explain why their place within critical thinking remains debated.

3.3.1 Connections between the conceptual framework and the review findings

The findings in this chapter broadly correspond to the conceptual account developed in Chapter One, but the significance of this correspondence lies in more than the recurrence of similar terms. Chapter One argued that critical thinking has a relatively stable conceptual core centred on reasons, evidence, arguments, and judgement, while also comprising two major dimensions, skills and dispositions, together with related dialogical elements. The present review suggests that these components are not confined to conceptual discussion. Rather, they also recur in the higher education literature in forms that are pedagogically recognisable: as teaching purposes, as teaching content, and as teaching methods. This indicates that the literature does not frame critical thinking through a purely incidental or diffuse collection of educational concerns. Instead, the reviewed studies point to a more patterned understanding in which certain conceptual components repeatedly structure how critical thinking is taught.

This correspondence is clearest in the findings on teaching purposes and content. The purpose theme Develop Analytical Skills and the content theme Argument Analysis closely reflect the skills dimension outlined in Chapter One, especially clarification and interpretation, argument identification and structural analysis, argument evaluation, and judgement. Likewise, the purpose theme Better Decision Making corresponds to the emphasis in Chapter One on judgement as an integral part of critical thinking, that is, deciding what to believe or do on the basis of reasoning. The purpose theme Develop Critical Thinking Dispositions, and the content theme Critical Thinking Dispositions as Content,

map directly onto the dispositional dimension discussed in Chapter One, including orientations such as open-mindedness, fair-mindedness, truth-seeking, and intellectual humility. In a similar way, the content theme Dialogue and Communication as Content reflects the claim made in Chapter One that critical thinking is not limited to internal cognitive operations, but also involves dialogical capacities such as reason-giving, responding to objections, and engaging with alternative viewpoints. Taken together, these correspondences suggest that the main categories identified conceptually in Chapter One are also the categories through which critical thinking is commonly framed in higher education teaching.

The findings on teaching methods show the same connection in procedural form. If critical thinking is conceptualised, as in Chapter One, as involving the analysis of arguments, the evaluation of evidence, the articulation of reasons, and reflective control over one's own thinking, then the predominance of active, oral, written, and collaborative learning becomes easier to explain. Active learning provides opportunities for students to practise analysis, evaluation, and judgement rather than only receive information. Oral learning supports the dialogical side of critical thinking by requiring students to explain, defend, and revise their views in discussions. Written learning makes reasoning more explicit and more open to organisation, scrutiny, and revision, thereby supporting both argument analysis and reflective self-monitoring. Collaborative learning creates conditions in which students must engage with alternative perspectives and justify their claims in relation to others, which is closely related to the dialogical and dispositional aspects described in Chapter One. In this sense, the methods identified in the review can be understood as pedagogical means through which the conceptual elements of critical thinking are enacted in teaching.

This consistency suggests that the conceptual account developed in Chapter One is also reflected in the ways critical thinking is framed in higher education teaching. The recurring emphasis on developing analytical skills and on argument analysis indicates that critical thinking teaching is not organised arbitrarily, but around a shared pedagogical logic grounded in these core elements. In this respect, the findings of Chapter Three suggest that the conceptual framework outlined in Chapter One can be extended beyond conceptual

definition and used to understand how critical thinking is translated into teaching purposes, content, and methods.

3.3.2 Clarifying the scope of civic engagement

From the coding results, 20 studies identified critical thinking as an important means of developing informed and independent citizens who can participate constructively in democratic life. The Delphi Report (Facione, 1990) explicitly linked critical thinking dispositions to the foundations of a rational and democratic society. Some scholars further conceptualised critical thinking as an intrinsically epistemic activity that involves weighing evidence and analysing arguments, while also carrying a civic mission of enabling individuals to engage in reasoned public discourse and resist manipulation (Halpern, 1998; Paul, 1999). Given this civic orientation, it is unsurprising that many educators in the reviewed studies sought to connect the purpose of critical thinking teaching with civic engagement. Several studies suggested that critical thinking instruction should be grounded in real-world social issues, encouraging students to apply their reasoning skills to matters of justice, policy, and community life (Alotaibi & Ismail, 2024; Murray, 2015; Franco, 2016).

However, the impulse to strengthen civic engagement may risk broadening the concept of critical thinking beyond its traditional scope. In particular, influences from critical theory have entered the discussion, infusing critical thinking education with aims of social critique and emancipation. It is crucial to recognise that critical thinking and Critical Theory emerge from distinct intellectual traditions. Scholars have noted that, despite surface similarities in language, the two paradigms embody different conceptions of what ‘being critical’ entails. critical thinking focuses on logical coherence, clarity of concepts, accuracy of evidence, and fairness in argumentation. In contrast, the critical theory tradition is rooted in neo-Marxian and postmodern critiques of society (Fendler, 1999; Peca, 2000). Here, the term ‘critical’ implies not just careful thinking, but an orientation toward exposing and undermining unjust social systems (Giroux, 2023). Instead of treating the thinker as an abstractly autonomous reasoner, critical theory views individuals as deeply embedded in social relations of power (for example, class, race, and gender) that shape what counts as knowledge and truth (Giroux, 2023; Peca, 2000). Thus, the model critical thinker in a critical theory sense is not a detached

logical analyst, but a socially aware critic who questions who benefits from certain knowledge claims and who seeks to transform society in the direction of justice.

Both perspectives are valuable, but they represent different priorities. As Burbules and Berk (1999) note, the critical thinking tradition aspires to an 'unbiased' mode of inquiry open to all truth claims, whereas critical theory explicitly rejects the ideal of unbiasedness, insisting that we must uncover how 'dominant frameworks define and constitute that which counts as knowledge' (Burbules & Berk, 1999). For this reason, the teaching purpose of civic engagement should be approached with caution, so as to avoid extending critical thinking too far into the domain of critical theory. The scope of civic engagement within critical thinking education should remain clearly defined, maintaining a primary focus on teaching students how to think rather than extending the concept of critical thinking to cover broader political or ideological formation. While both critical thinking and critical theory are valuable, conflating the two may lead to conceptual overstretch, which risks undermining the analytic rigour of critical thinking and creating ambiguity in research and pedagogy. Several scholars have warned that stretching the critical thinking concept too broadly to include any form of critique or normative agenda can dilute its precision and educational coherence (Burbules & Berk, 1999; Fendler, 1999).

To address this concern, it is important to clarify what an appropriate scope of civic engagement within critical thinking education entails. Rather than promoting a particular ideology, critical thinking instruction should emphasise critical thinking skills that enable reasoned judgement and responsible participation in public discourse. If civic engagement is to be retained, it should focus on equipping students with critical thinking skills that can be applied to civic and democratic contexts. In this way, critical thinking can support meaningful participation in public life while maintaining its epistemic (rather than normative) focus. Therefore, this study proposes to treat civic engagement as a dimension embedded within the broader theme of Develop Analytical Skills and Better Decision Making, which preserves the intellectual core of critical thinking education while recognising its potential contribution to democratic life.

3.3.3 Clarifying the relationship between critical and creative thinking

In the scoping review results, 12 out of 64 studies positioned creativity development as a teaching purpose of critical thinking courses. This indicates that many educators perceive critical thinking and creative thinking as complementary processes in learning (Reid & Anderson, 2012; Hannon et al., 2004; Goh, 2012). Students often employ reflective judgement and analytical reasoning associated with critical thinking alongside the divergent, imaginative thought that characterises creative thinking. Through this combination, they are encouraged to approach problems in original and flexible ways (Paul & Elder, 2006).

However, it is essential to approach this connection with conceptual clarity. While critical thinking and creativity are both higher-order cognitive skills valuable in higher education, they differ in focus and function (Sternberg, 2018). Critical thinking is oriented toward analysis and evaluation of ideas or arguments, aiming for sound judgement and decision-making (Ennis, 2015). Creative thinking, in contrast, is oriented toward generating novel and useful ideas by exploring many possibilities (Dwyer, 2023). Critical thinking employs logical reasoning to assess the strength or validity of arguments. Creative thinking employs divergent thinking, expanding the range of ideas without immediate judgement to foster originality (Dwyer, 2023). Recognising these distinctions is crucial. Critical thinking and creative thinking can complement each other, yet they should not be conflated. Such a conflation may lead to several problems in both theory and pedagogy. Conceptually, the indiscriminate merging of critical thinking and creative thinking risks diluting the analytical precision of critical thinking by shifting its focus from evaluation and justification to idea generation (Paul & Elder, 2006). Pedagogically, the confusion may result in instructional designs that prioritise imaginative output over rigorous analysis, thereby weakening students' ability to assess the credibility and coherence of ideas. Therefore, learners might produce more ideas but lack the evaluative tools necessary to determine which ideas are valid, feasible, or ethically sound.

Critical thinking provides the reflective and evaluative foundation upon which creative insights can be developed, but the cultivation of creativity should not itself be defined as a core teaching purpose of critical thinking education. In the following chapters, instances of

creativity linked with critical thinking will continue to be reported to remain faithful to the original data, while acknowledging the conceptual distinction between creative thinking and critical thinking.

3.3.4 Reconsidering Problem Solving as a component of critical thinking

The coding results identified Problem Solving in 18 studies as a teaching content. However, the boundaries of this theme are vague and heavily overlap with other critical thinking skills. Many tasks labelled as Problem Solving such as defining a problem clearly, comparing alternative solutions, and evaluating options, are essentially the same cognitive processes used in argument analysis and evidence evaluation (Reid & Anderson, 2012). In practice, identifying and weighing alternative solutions often means constructing or assessing arguments for those options. Thus, Problem Solving tends to subsume other well-defined critical thinking skills rather than stand apart as a distinct skill set. For example, Olivares et al. (2013) observed that it is very difficult to separate Problem Solving from decision-making, since solving a problem usually involves making choices among alternatives. Although Problem Solving is recognised as a distinct cognitive domain within cognitive science, its boundaries become less clear when incorporated into critical thinking teaching. Within critical thinking curricula, the reasoning steps involved in Problem Solving are usually addressed through other core critical thinking skills such as analysis, inference, and evaluation, rather than being taught as a separate instructional focus. Indeed, expert consensus reports on critical thinking distinguish Problem Solving as a related but separate form of thinking, which belongs to the same ‘family’ as critical thinking but is not itself counted among the core critical thinking skills (Facione, 1990).

In other words, not every valuable cognitive process should be labelled as critical thinking; Problem Solving and creative thinking are closely allied higher-order skills, but they are conceptually distinct from critical thinking in the strict sense (Facione, 1990). Given this perspective, treating Problem Solving as an independent critical thinking content area may be misleading. It risks rebranding general problem-based reasoning as if it were a unique critical thinking skill, when in reality those reasoning steps (e.g. formulating and evaluating solutions) are already encompassed by other critical thinking skills like inference and

evaluation.

For these reasons, the theme of Problem Solving should be approached with caution and not regarded as an isolated content area in a critical thinking curriculum. Instead, it is more coherent to recognise Problem Solving as an application context or an amalgam of critical thinking skills rather than a stand-alone theme. In the remainder of the thesis, Problem Solving will be reported as part of the original data where relevant, while recognising its conceptual closeness to analysis, inference, and evaluation.

3.4 Chapter summary

This chapter maps the landscape of stand-alone critical thinking teaching in international higher education through a scoping review. The findings show a high degree of coherence across teaching purposes, content, and methods. Courses typically aim to develop analytical and reasoning abilities, enhance students' learning capacity, and improve decision-making. Correspondingly, argument analysis emerged as the core focus of teaching content, while active and participatory forms of learning were the most common instructional approaches, often supplemented by oral discussion, writing tasks focused on the articulation and evaluation of reasons, and collaborative activities. The review indicates a consistent pedagogical pattern in which argument-centred content is taught through active learning methods to support the development of analytical judgement.

At the same time, the analysis identified several conceptually ambiguous themes, including civic engagement, creativity, and Problem Solving. These themes appeared in a number of studies but show varying degrees of overlap with the core epistemic functions of critical thinking. Their position within the broader conceptual framework of critical thinking instruction therefore requires further clarification, which will be revisited in later chapters. It is also important to note that this chapter has focused specifically on stand-alone courses reported primarily in English-language scholarship, which may introduce contextual and curricular limitations. These issues will be discussed in the final discussion.

The next chapter turns to Chinese higher education, examining how the purposes, content, and methods of critical thinking instruction are represented in studies of Chinese universities. The comparison will distinguish recurrent curricular features from context-dependent ones, providing a basis for considering their possible relevance to course development in Chinese higher education.

Chapter Four: Scoping review of critical thinking teaching in Chinese higher education

4.1 Introduction

Chapter Three maps the purposes, content, and methods of stand-alone critical thinking courses in international contexts, but much less is known about how critical thinking is conceptualised and implemented in Chinese universities. This chapter has two objectives: first, it examines the teaching purposes, content, and methods of teaching critical thinking in Chinese higher education; second, it compares these patterns with those identified in the international literature in order to provide preliminary evidence of both shared orientations and context-specific features relevant to the development of critical thinking courses in Chinese higher education.

To enable comparison with the international review, this chapter adopts the same scoping review approach and analytical framework used in Chapter Three. Further methodological details are provided in Chapter Two. After database searching, screening, and full-text assessment, six studies were identified that examine stand-alone critical thinking courses in Chinese universities.

The chapter first presents the search results, then offers a thematic synthesis structured around teaching purposes, content, methods, and finally discusses their implications for the comparative analysis developed in the following chapter.

4.2 Results

4.2.1 Selection of sources of evidence

To identify relevant studies on critical thinking teaching in Chinese higher education, a two-stage scoping search was conducted, comprising parallel searches of English-language and Chinese-language academic literature. Both searches were designed to capture research on the purposes, content, and methods of teaching critical thinking in higher education.

First, English-language literature was identified through systematic searches of three major international databases: ERIC, Web of Science, and Scopus. The same search terms used in the international scoping review were employed, with the addition of AND ('China' OR 'Chinese') to restrict results to the Chinese context. The full search strings are provided in Chapter Two. All searches were completed in October 2025. This stage yielded a total of 734 records (Scopus = 375; Web of Science = 170; ERIC = 189). After removing 194 duplicates, 540 records remained for title and abstract screening. Of these, 506 records were excluded, leaving 34 articles for full-text eligibility screening. Following full-text review, 31 articles were excluded: 15 embedded critical thinking within other disciplinary courses rather than addressing it as a distinct teaching focus; 14 did not explicitly address the purposes, content, or methods of teaching critical thinking; one was not situated in a higher education context; and one did not focus on China. This process resulted in three English-language peer-reviewed articles being retained for final inclusion.

Second, to ensure coverage of Chinese-language scholarship, an additional search was conducted through the EBSCOhost research platform using the Chinese-language search string reported in Chapter Two. The same eligibility criteria were applied as in the English-language search. This search returned 124 records. After title and abstract screening, 11 articles were retained for full-text review. Of these, eight were excluded: four did not address the purposes, content, or methods of teaching critical thinking, and four focused on critical thinking embedded within other disciplinary courses rather than on its teaching as a distinct focus. This resulted in the inclusion of three Chinese-language peer-reviewed articles.

Together, the two parallel searches yielded a final sample of six studies. While the overall number of eligible Chinese studies is relatively small, this outcome reflects the limited volume of research that explicitly addresses critical thinking teaching at the course level within Chinese higher education. A PRISMA-ScR flow diagram summarising the screening and selection processes for both English- and Chinese-language searches is presented in Chapter Two.

4.2.2 Findings

4.2.2.1 Teaching purposes

Analysis of the six included studies identified seven teaching purpose themes. Developing analytical skills was identified in all six studies, making it the most consistently articulated teaching purpose. The development of critical thinking dispositions was identified in five studies, followed by the development of creativity in four studies. Civic engagement and better decision making were each identified in three studies, enhanced learning in two studies, and effective communication in none of the included studies. For detailed explanations of each theme, reference is made to the corresponding chapter of the international scoping review. While this range of purposes broadly overlaps with those identified in the international scoping review, the reviewed Chinese literature suggests a pattern in which teaching purposes are often articulated at a macro level, with comparatively limited specification of concrete course objectives.

Across the six included studies, developing analytical skills was consistently identified as a central teaching purpose. In all cases, critical thinking was framed in terms of students' ability to analyse information, evaluate evidence, assess arguments, and form reasoned judgements. This core orientation aligns with the emphasis on analytical capability observed in the international scoping review and reflects a shared understanding of critical thinking as a form of rational and evaluative thinking.

Beyond this shared emphasis, however, the Chinese literature frequently situates teaching purposes for critical thinking within a broader national and strategic context. In these studies, critical thinking is often framed less in terms of specific course-level instructional goals than as a capability linked to broader national development agendas. Several studies explicitly link critical thinking teaching to the strategic objective of building China into 'a leading country in education, science and technology, and talent development' (教育强国、科技强国、人才强国) by 2035 (Liu & Li, 2023; Lyu, 2025). In this framing, the development of analytical skills is not presented as an end in itself, or even as benefitting academic development, but as a foundational intellectual capacity associated with broader aims of innovation-driven development and national competitiveness. This national strategic

orientation is realised through a combination of teaching purpose themes. First, analytical skill development is framed as essential for strengthening national scientific and technological capacity. For example, Liu and Li (2023) explicitly situate critical thinking within policy discourse associated with national development strategies. They argue that cultivating students' analytical judgement is necessary to 'serve national strategies' (服务国家战略) and to 'strengthen national strategic science and technology capabilities' (强化国家战略科技力量).

Second, the development of creativity is repeatedly invoked as a key pathway through which critical thinking contributes to national goals. In several studies, creativity is positioned as the ultimate educational objective, while critical thinking is framed as the cognitive foundation that enables creative and innovative outcomes. Lyu (2025), for instance, explicitly links critical thinking to the cultivation of 'top-notch innovative talents' (拔尖创新人才), which is described as a central task in the process of Chinese-style modernisation. In this account, critical thinking is characterised as a form of higher-order thinking that arises in response to open-ended and intellectually challenging problems and enables learners to generate new ideas and new knowledge through reflective judgement and hypothesis testing. Innovation thus occupies a higher-level goal position, with critical thinking serving as the mechanism through which it can be realised (Lyu, 2025).

Across these studies, critical thinking is therefore frequently embedded within a purposive hierarchy (Liu & Li, 2023; Lyu, 2025; He & Yao, 2024). Innovation, national development, and technological competitiveness are positioned as overarching educational and societal goals, while critical thinking is framed as a key enabling capacity that supports the achievement of these goals. This may reflect a broader tendency in Chinese higher education discourse, in which educational purposes across multiple subjects are commonly framed in relation to national development, innovation, and talent cultivation (General Office of the Communist Party of China & General Office of the State Council, 2017). From this perspective, critical thinking is commonly framed as a capacity expected to contribute to wider strategic objectives, rather than being presented primarily as a self-standing educational end.

At the same time, this macro-level articulation is accompanied by limited specification of concrete instructional objectives. While the importance of critical thinking is strongly emphasised in relation to national strategies, relatively little detail is provided regarding how these purposes are translated into clearly defined course-level goals. Teaching purposes are rarely expressed in terms of specific learning outcomes, measurable competencies, or detailed expectations of what students are intended to learn within particular courses. Although some degree of generality is to be expected in discussions of educational purpose, the studies reviewed here tend to remain primarily at the level of broad justification, with less explicit articulation of course-specific aims, expected learning outcomes, or operationalised instructional targets.

4.2.2.2 Teaching content

Thematic analysis of the six studies identified six teaching content themes related to critical thinking instruction: Argument Analysis (6/6), Foundations and Importance of Critical Thinking (4/6), Problem Solving (2/6), Dialogue and Communication as Content (2/6), content related to Academic Development (2/6), and Fallacies (1/6). These themes correspond to those identified in the international scoping review. Argument analysis appears as a central teaching content theme in both the Chinese and international literature, indicating broad agreement on its importance within critical thinking instruction. However, comparison of the Chinese and international literature indicates a difference in how teaching content relates to critical thinking is foregrounded. While both bodies of literature address the nature and significance of critical thinking, Chinese studies devote more sustained attention to explaining its conceptual foundations and educational importance. In contrast, international studies more commonly treat such discussion as contextual framing for subsequent focus on instructional design and implementation.

In the international literature, explanations of what critical thinking is and why it is valued in higher education are typically concise and positioned at the outset of studies. These discussions provide theoretical orientation but are not usually developed as a central component of teaching content. Instead, content-related analysis tends to concentrate on how critical thinking is addressed through course structures and instructional activities. By

contrast, Chinese studies frequently allocate substantial space to clarifying the meaning, characteristics, and educational role of critical thinking as part of their discussion of teaching content. For example, Lyu (2025) engages in extended conceptual discussion of critical thinking through cultural comparison, examining how different intellectual traditions shape its understanding and cultivation in the Chinese context. In this study, explanation of the conceptual basis of critical thinking forms a significant portion of the content discussion. This emphasis on foundational clarification is also present in studies that situate critical thinking within contemporary social and technological contexts. For example, He and Yao (2024) discuss critical thinking as a foundational capability for university students in the context of artificial intelligence, devoting considerable attention to explaining its necessity and role in responding to technological change. This again suggests that Chinese studies often devote substantial space to justificatory and conceptual discussion, rather than moving directly to the specification of course content.

4.2.2.3 Teaching methods

Using the same coding framework as the international scoping review, thematic analysis of the six Chinese studies identified five teaching method themes related to critical thinking instruction: active learning (6/6), collaborative learning (4/6), oral learning (4/6), written learning (3/6), and technology-enhanced learning (2/6). These methods correspond closely to those identified in the international literature. Although both bodies of literature identify the same method themes, these methods are applied with different instructional priorities.

At the level of technology-enhanced learning, He and Yao (2024) do not treat artificial intelligence (AI) merely as a digital tool for improving instructional efficiency or expanding learning resources. Instead, the study places particular emphasis on the role of AI in alleviating culturally embedded psychological pressure and in promoting the de-authoritisation of classroom interaction. This approach reflects a contextualised understanding of the pedagogical function of technology, whereby technological tools are introduced as a means of responding to authority-oriented learning patterns shaped by traditional cultural norms (He & Yao, 2024). The underlying rationale relates to the long-standing emphasis on authority and tradition within Chinese knowledge cultures, which

often encourages students to accept established conclusions rather than to question them. In teacher-centred classroom settings, teachers may intervene too quickly or too extensively in students' thinking processes, inadvertently constraining opportunities for tentative judgement and independent reflection. Within this context, AI systems are introduced as a safer space for learning. He and Yao (2024) argue that AI-mediated feedback may be experienced as less socially pressurising than teacher feedback, because it is not tied to the same interpersonal authority relations. Studies argue that, when interacting with system-generated feedback, students experience reduced psychological pressure associated with 'concerns about loss of face' or demonstrating respect for authority (He & Yao, 2024). As a result, they may be more willing to express dissenting views and accept logical correction. By altering the source of feedback, technology-enhanced learning thus reshapes patterns of classroom interaction, allowing students to focus more directly on reasoning processes rather than on social evaluation.

At the level of implementation, He and Yao (2024) further propose the use of 'personalised learning pathways' (个性化学习路径) and an 'intelligent evaluation and feedback system' (智能评估与反馈系统) to support the development of critical thinking. For example, through intelligent writing assistants and debate training systems, AI can analyse students' texts or arguments in real time, identify weaknesses in logical reasoning or argumentative structure, and offer specific suggestions for improvement. At the same time, by continuously collecting and analysing students' learning behaviour data, AI systems can detect conceptual misunderstandings or reasoning blind spots, thereby enabling targeted intervention. In addition, artificial intelligence is used to construct virtual learning environments that simulate authentic learning or workplace scenarios, allowing students to experiment with multiple solutions in the absence of real-world social pressure and to refine their judgements through repeated comparison and reflection (He & Yao, 2024). In this application, the core value of technology-enhanced learning lies not in replacing teachers or automating instructional processes, but in modifying interaction structures and feedback mechanisms so as to provide a lower-risk, more exploratory cognitive space for the exercise of critical thinking.

In the use of collaborative learning, Liu and Li (2023) and Lyu (2025) similarly demonstrate a functional emphasis that appears somewhat different from the way collaborative learning is often discussed in the international literature reviewed in Chapter Three. Rather than being viewed solely as a means of promoting teamwork or completing shared tasks, collaborative learning is assigned the explicit pedagogical purpose of counteracting homogenised thinking associated with collectivist cultural orientations, using group dynamics to foster individual intellectual independence.

Liu and Li (2023) discuss the use of brainstorming and seminar-based teaching, drawing on the example of a 'brainstorming seminar' (头脑风暴座谈会). This form of seminar is designed to deliberately generate cognitive tension and draws on principles associated with brainstorming approaches, including the encouragement of unrestricted idea generation, the suspension of immediate criticism or evaluation, the production of multiple possible responses before selecting among them, and the combination and refinement of participants' ideas. Within this format, the aim of discussion is not to reach rapid consensus, but to disrupt cognitive stability through the juxtaposition of multiple viewpoints, thereby encouraging reflective reconsideration of initial judgements (Liu & Li, 2023; Lyu, 2025).

In practice, teachers guide students to articulate different, and sometimes conflicting, positions in response to the same question, while intentionally delaying evaluative judgement or synthesis (Liu & Li, 2023). Students are trained to express original ideas while practising 'delayed judgement' (延迟评判). This means that they are encouraged not to reach immediate conclusions about others' views, but instead to maintain openness through sustained questioning, such as examining whether claims are factually grounded or sufficiently justified (Liu & Li, 2023). This instructional arrangement is intended to prevent premature convergence in group discussion and to preserve space for rational comparison and reflective evaluation, particularly in group-based discussion settings (Liu & Li, 2023; Lyu, 2025).

In educational environments that emphasise moral cultivation and normative forms of knowledge, students may be inclined to treat knowledge as something that should not be

challenged (Liu & Li, 2023). Through academic dialogue and collaborative Problem Solving, thinking is redefined as a dynamic interactive process rather than the repetition of authoritative conclusions (Liu & Li, 2023). Within group interaction, collaborative discussion is intended to expose students to conflicting viewpoints and to create a degree of cognitive pressure that may encourage them to step back from collective consensus and engage in deeper self-reflection (Lyu, 2025).

Within this framework, collaborative learning does not aim to reinforce uniformity but is instead transformed into a training tool for cultivating rational expression and independent judgement in group settings (Liu & Li, 2023). Teachers primarily adopt the role of facilitators and are advised to be the last to express their own views, so as to ensure that students have sufficient time and space for independent thinking and critical questioning during collaborative discussion (Liu & Li, 2023). In this way, group interaction itself becomes a condition for reflection and judgement, rather than a constraint on the development of critical thinking (Lyu, 2025).

These method-level patterns also appear broadly aligned with the purposes identified earlier in the chapter. Where critical thinking is linked to creativity, innovation, and the cultivation of high-level talent, the proposed methods tend to emphasise openness, divergence, experimentation, and the suspension of premature judgement. In this respect, collaborative and technology-enhanced approaches are not presented simply as general pedagogical techniques, but as ways of creating the conditions for more exploratory, independent, and potentially innovative forms of thinking.

Overall, the findings show that although the same teaching method themes appear in both the Chinese and international literature, their use in the Chinese context reflects a process of contextual adaptation. Rather than introducing distinct method themes, Chinese studies propose common approaches such as technology-enhanced learning and collaborative learning to address authority-oriented classroom relations and conformity tendencies shaped by local educational norms. These methods are presented as ways of adjusting interaction patterns, feedback mechanisms, and participation structures, indicating that shared

pedagogical approaches are given different instructional priorities in response to the Chinese higher education context. However, the reviewed studies offer limited evidence regarding how widely these approaches are used in practice or how effective they are in achieving their intended aims. Further empirical research would therefore be valuable.

4.3 Discussion

4.3.1 Critical thinking teaching in China as a possible process of legitimation and positioning

The findings of this chapter suggest that research on critical thinking teaching in Chinese higher education may still be situated within a phase characterised primarily by legitimation and positioning, rather than by an emphasis on fine-grained course design (Liu & Li, 2023; Lyu, 2025). This observation is mainly reflected in how teaching purposes and teaching content are articulated. Specifically, the Chinese literature places strong emphasis on the role of critical thinking in supporting national development, innovation capacity, and modernisation goals, while substantial attention is devoted to explaining the conceptual foundations and educational significance of critical thinking (Liu & Li, 2023; Lyu, 2025; He & Yao, 2024). Overall, these studies tend to focus on what role critical thinking should play within higher education, rather than on how it is systematically represented at the course level.

This pattern can be understood in relation to the institutional positioning of critical thinking within Chinese higher education (Liu & Li, 2023; Lyu, 2025). Unlike in many Western higher education systems, where critical thinking is widely accepted as a core graduate capability, critical thinking in China may still be regarded as a form of cognitive approach whose value and applicability require further clarification within the curriculum (Lyu, 2025).

Within this context, Chinese research on critical thinking appears, to some extent, to take on a legitimising function, seeking to explain its relevance and appropriateness within Chinese higher education (Liu & Li, 2023; Lyu, 2025). This tendency may be related to differences in how knowledge and learning are commonly understood across educational traditions. In educational contexts where respect for teachers and the maintenance of orderly and

harmonious classroom interaction is emphasised, students may be less inclined to openly question the views of teachers or peers in public settings (Liu & Li, 2023). Such practices reflect interactional norms rather than cognitive agreement with particular viewpoints. Within this framework, knowledge is often presented as something to be inherited and internalised through learning, rather than as an object that is continuously questioned and revised (Lyu, 2025). By contrast, critical thinking places emphasis on evidence-based judgement and on the analysis, evaluation, and revision of claims. At the level of classroom practice and expression, this orientation may not fully align with established patterns of learning interaction. In this light, the recurrent emphasis in the Chinese literature on clarifying the foundations and value of critical thinking can be understood as a form of explanatory or adaptive effort (Liu & Li, 2023; Lyu, 2025).

By comparison, the need to justify the curricular legitimacy of critical thinking appears less pronounced in some parts of the international literature, particularly in the United States and Australia. Because its status as a central component of higher education is widely accepted, research attention has largely shifted toward issues of course structure, content organisation, and instructional implementation.

4.3.2 The possible implications of macro-level strategic framing of teaching purposes

The findings of this chapter also indicate that teaching purposes for critical thinking in the Chinese literature are frequently articulated within a macro-level strategic framework (Liu & Li, 2023; Lyu, 2025). Many studies explicitly link critical thinking instruction to national development objectives, such as innovation-driven growth, technological competitiveness, and long-term goals associated with building China into a strong education, science and technology, and talent nation by 2035 (Liu & Li, 2023; Lyu, 2025; He & Yao, 2024). Within this framing, critical thinking is often presented as a key capability that supports national development and talent cultivation, rather than primarily as a set of course-level learning purposes.

This strategic framing may provide policy-level justification for the inclusion of critical

thinking within higher education curricula. By aligning critical thinking with national development priorities, its importance within the higher education system is reinforced, potentially creating institutional space and support for curriculum development and teaching reform (Liu & Li, 2023; Lyu, 2025).

At the same time, some degree of alignment can also be seen between the purposes attached to critical thinking and the teaching methods proposed to support it, particularly where critical thinking is linked to creativity, innovation, and the cultivation of high-level talent. In these cases, the methods discussed are not presented simply as general pedagogical techniques, but as approaches intended to foster the kinds of thinking that such purposes require. For example, collaborative formats that expose students to competing viewpoints and encourage delayed judgement may help preserve openness, promote reflective reconsideration, and prevent premature consensus (Liu & Li, 2023; Lyu, 2025). Similarly, technology-enhanced approaches that reduce authority pressure and provide opportunities for iterative feedback, comparison, and experimentation may create a lower-risk space for more independent and exploratory judgement (He & Yao, 2024). In this sense, the literature suggests at least a partial correspondence between the stated purposes of creativity and innovation, and the pedagogical logic of the methods proposed to realise them.

However, this apparent alignment should not be taken to mean that the relationship between purposes and practice is fully specified at the course level. Although the studies reviewed offer some indication that particular methods are pedagogically compatible with broader aims such as creativity, innovation, and talent cultivation, they provide comparatively limited detail on how these aims are translated into concrete course objectives, sequenced instructional activities, or assessable learning outcomes. Critical thinking is often justified in relation to broad goals such as innovation, national development, and the cultivation of talent, but there is less discussion of what these goals mean in terms of particular topics, classroom tasks, or criteria for evaluating students' progress within specific courses (Liu & Li, 2023; Lyu, 2025). As a result, the literature tends to be stronger in explaining why critical thinking matters than in showing how it can be systematically embedded in everyday classroom practice. This gap is significant because policy-level endorsement and broad

educational aspiration do not by themselves provide sufficient guidance for curriculum implementation. Without clearer course-level specification, teachers may still face uncertainty about what to prioritise, how to sequence teaching, and how to connect larger strategic purposes with the teaching methods and classroom techniques that are discussed, but not usually elaborated in a systematic course-level way. From this perspective, teaching-focused research alone may be insufficient to fully explain how critical thinking curricula are designed in Chinese higher education, and further attention to policy texts and curriculum documents may be necessary in order to understand how macro-level priorities are translated into pedagogical practice.

From this perspective, the macro-level strategic orientation identified in this chapter does not constitute a final conclusion but rather points to the need for further analysis. Examination of national and higher education policy documents may help clarify how critical thinking is framed in policy discourse, what forms of capability are emphasised, and how such expectations are interpreted and translated into curricular design and teaching practice by universities. This line of inquiry provides a clear rationale for the syllabus analysis undertaken in the following chapter, and for the later policy analysis.

4.4 Chapter summary

This chapter has examined how critical thinking teaching is conceptualised and discussed in Chinese higher education through a scoping review of both English- and Chinese-language literature. By applying the same analytical framework used in the international scoping review, the chapter analysed teaching purposes, teaching content, and teaching methods associated with critical thinking instruction, with particular attention to studies addressing stand-alone critical thinking courses.

The review indicates that research explicitly addressing stand-alone critical thinking courses in Chinese higher education remains limited. Among the six studies that met the inclusion criteria, teaching purposes were most consistently framed around the development of analytical skills, with additional emphasis on critical thinking dispositions, creativity, civic engagement, and decision-making. While these purposes broadly overlap with those

identified in the international literature, their articulation in the Chinese context is characterised by a strong macro-level orientation. Critical thinking is frequently positioned as a foundational capability that serves broader national and strategic goals rather than being defined primarily through course-level learning objectives.

In terms of teaching content, argument analysis emerged as a central component across all included studies, indicating shared recognition of its importance in critical thinking instruction. However, Chinese studies devote comparatively greater attention to explaining the conceptual foundations and educational significance of critical thinking as part of their content discussion (Liu & Li, 2023; Lyu, 2025; He & Yao, 2024). Such foundational explanation often occupies a substantial proportion of content-related analysis, whereas in the international literature it typically functions as contextual framing for more detailed examination of instructional design.

With respect to teaching methods, the same broad categories identified in the international scoping review were also present in the Chinese literature. However, these methods are frequently employed with context-specific pedagogical aims. In particular, technology-enhanced learning and collaborative learning are used not only to support skill development, but also to address authority-oriented classroom relations and conformity tendencies associated with local educational norms. This suggests that shared pedagogical approaches are adapted to respond to distinctive interactional and cultural conditions within Chinese higher education.

Several limitations should be acknowledged. First, the number of studies that explicitly examine stand-alone critical thinking courses in Chinese higher education is small, which constrains the scope of thematic synthesis and limits the generalisability of the findings. Second, the scoping review is reliant on how critical thinking teaching is described in published research, rather than on direct evidence of enacted classroom practice. As such, the analysis reflects the discursive representation of critical thinking teaching rather than its actual implementation. In addition, variation in methodological quality and reporting depth across studies further limits the extent to which detailed comparisons can be made. Finally,

the chapter focuses on research literature rather than policy documents or curriculum regulations. As a result, it captures how scholars frame critical thinking teaching, but does not fully account for how institutional or policy-level expectations shape curriculum design and pedagogical practice in Chinese universities.

These limitations point to directions for the subsequent chapters of the thesis. The limited specification of course-level objectives and instructional design identified in the literature suggests the need to move beyond research discourse and to examine how critical thinking is articulated in actual course structures. Accordingly, the following chapters shift the focus from research literature to curriculum documentation, beginning with an analysis of critical thinking course syllabuses. Using the same analytical framework, the thesis first examines syllabuses from Western higher education contexts and then analyses Chinese critical thinking syllabuses. This cross-contextual comparison enables a systematic examination of how teaching purposes, teaching content, and teaching methods are formally specified at the course level, and whether patterns identified in the literature are reflected in curriculum design. Building on the syllabus analysis, a later chapter turns to national education policy documents to examine how critical thinking is framed at the policy level. The policy analysis explores how macro-level expectations regarding critical thinking capability are articulated, and how such expectations may shape or constrain curriculum design and instructional priorities. Together, the syllabus and policy analyses allow the thesis to trace the relationship between research discourse, curriculum representation, and policy framing of critical thinking within and across educational contexts.

Chapter Five: Thematic analysis of critical thinking course syllabuses in Western universities

5.1 Introduction

Building on the scoping review presented in Chapter Three, this chapter examines how critical thinking is taught in Western higher education through the analysis of critical thinking course syllabuses. The scoping review mapped how the purposes, content, and methods of teaching critical thinking are discussed in published studies. However, research articles and syllabuses represent different forms of curricular and scholarly writing. Research texts often highlight innovative designs and theoretical aspects of critical thinking pedagogy. Syllabuses formalise what a course officially promises to students. They specify teaching purposes, content and methods, usually within relatively standardised formats (Parkes & Harris, 2002; Habanek, 2005). Syllabus analysis therefore makes it possible to examine the relationship between published discussions of teaching critical thinking and the more standardised forms through which critical thinking courses are formally presented. In this sense, syllabuses may reflect ideas discussed in the literature, but they also show which teaching purposes, content and methods have become established as standard features of critical thinking courses within the discipline.

This chapter has three research objectives. First, it identifies the teaching purposes, content and methods that appear in 44 critical thinking syllabuses from Australia, Canada, the United Kingdom and the United States, building on the coding framework developed in the scoping review. Second, it examines whether the recurrent configuration highlighted in the scoping review, linking analytical goals, argument-centred content, and active learning approaches, is also reflected in institutional course documents. Third, it identifies features of Western critical thinking course design that may be relevant to Chinese higher education. These features are considered alongside the Chinese evidence in the following chapters, contributing to the thesis's broader aim of developing a workable and context-sensitive course framework for Chinese higher education.

A key premise guiding this chapter is that syllabuses primarily reflect formal pedagogical goals but may not fully capture the enacted or implicit curriculum. In some cases, they also list intended content areas without providing detailed accounts of conceptual progression. Syllabus analysis is therefore useful for examining the stated priorities and formal organisation of stand-alone critical thinking courses, rather than the full complexity of classroom practice or wider curricular intentions.

For these reasons, this chapter continues to adopt an abductive thematic analysis, starting with the same coding framework from the scoping review in Chapter Three. The coding process begins with the purpose, content and method themes established in the scoping review in Chapter Three, which are applied to the syllabuses to ensure analytic continuity across chapters. When syllabus statements clearly correspond to these existing themes, they are coded using the same thematic labels. Where syllabus texts articulate purposes, content or methods that are not adequately captured by the review-derived framework, these elements are coded inductively and considered as potential new themes.

Guided by these objectives and assumptions, the chapter proceeds in several steps. First, it outlines the syllabus dataset and analytical procedures, including the construction of the deductive framework from the scoping review and the use of abductive thematic coding. It then reports the distribution of teaching purposes, content and methods across the 44 syllabuses in order to identify the most visible elements of the explicit curriculum. The next three sections examine in turn how teaching purposes, content and methods are articulated at syllabus level, with particular attention to points of convergence and divergence from the patterns reported in the scoping review. The discussion then draws these strands together by advancing three structural ideas concerning the role of argument analysis as a curricular spine, the status of several extension themes, and the prevalence of multi-method designs. It concludes by indicating how these ideas will be taken forward in the following chapters, first through comparison with Chinese critical thinking syllabuses and later through analysis of textbook sequencing and task design.

5.2 Data sources and analytical approach

This chapter draws on a set of syllabuses for stand-alone critical thinking courses in Western higher education. Details of the inclusion criteria and data collection procedures are reported in full in Chapter Two: Methodology. The materials analysed here were accessed through publicly available university websites, where they typically appeared as course outlines, module handbooks, or syllabus pages, usually listing items such as course descriptions, learning outcomes, weekly topics, assessment requirements, and, in some cases, teaching arrangements. At the same time, these documents varied considerably in length, format, and institutional template. Some provided substantial detail about course aims, weekly activities, and delivery arrangements, whereas others were much more concise and focused mainly on content, learning outcomes, or assessment. As a result, the absence or low visibility of a particular feature in a syllabus should not automatically be taken as evidence that it was absent from the teaching itself. Throughout the chapter, such cases are therefore interpreted with caution.

The sample includes institutions from Australia, Canada, the United Kingdom and the United States. These four contexts were chosen because they provide a large and reasonably representative set of stand-alone critical thinking courses, and because their higher-education systems have long treated critical thinking as an important educational priority. This broader priority does not mean that critical thinking is equally institutionalised everywhere through stand-alone courses. In some contexts, including the United Kingdom, critical thinking is more often embedded in wider graduate attribute or programme-level frameworks than offered as a distinct course type. Even so, these four countries provide a strong basis for examining how stand-alone critical thinking teaching has been formally articulated where such courses are available. In the scoping review, these countries account for 42 of the 64 included studies, suggesting that they offer a representative basis for examining stand-alone critical thinking teaching internationally. In the United States, general education structures often encourage clear course-level statements of critical thinking outcomes (Fliegel & Holland, 2013; Halpern, 1998; Roberts, 2020). In Australia, critical thinking is often framed through university-wide graduate attribute models that shape how individual courses present aims and outcomes (Davies, 2019; Manning, 2024; Twardy,

2004). Canada and the United Kingdom provide further Anglophone comparison points in which critical thinking and related graduate capabilities are articulated not only at course level, but also through broader institution-level frameworks. In Canada, national and provincial degree-level expectations explicitly include critical thinking and analytical skills (Government of Ontario, 2022). In the UK, sector-led quality enhancement work and national mapping studies indicate a sustained emphasis on graduate attributes across universities, with critical thinking and related analytical capabilities often embedded within these broader frameworks (Wong et al., 2022). The final dataset comprises 44 syllabuses: United States (14), Australia (13), Canada (10), and the United Kingdom (7).

The analytic framework for this chapter is derived from the preceding scoping review in Chapter Three, which identified 19 themes across three dimensions of critical thinking teaching in higher education. Teaching purposes include Develop Analytical Skills, Enhanced Learning, Better Decision Making, Develop Critical Thinking Dispositions, Civic Engagement, Develop Creativity and Effective Communication. Teaching content includes Argument Analysis, Critical Thinking Dispositions as Content, Problem Solving, Fallacies, Dialogue and Communication as Content, Foundations and Importance of Critical Thinking, and Academic Development. Teaching methods include Active Learning, Oral Learning, Written Learning, Collaborative Learning and Technology-Enhanced Learning. Alongside this deductive framework, the analysis also allowed for inductive coding of recurrent syllabus emphases that did not fit the 19 review-derived themes. However, no additional themes were identified that appeared with sufficient consistency across the dataset to justify inclusion as new themes in the final framework. This may reflect the relatively standardised and condensed nature of syllabus documents, which tend to formalise course aims, content and teaching arrangements in predictable ways rather than elaborate novel pedagogical ideas. It may also suggest that the scoping review had already captured many of the most stable and recurrent elements of stand-alone critical thinking teaching, with variation at syllabus level taking the form of different emphases within existing themes rather than clearly distinct new thematic categories.

A summary of institutional and course characteristics is provided in the Appendix D1. This

table documents the evidence base for interpretation and includes the original syllabus excerpts, the corresponding theme labels, and the location of each excerpt within the syllabus text. Where relevant, brief coding notes clarify how each excerpt was mapped to the review-derived framework. The coding template and pilot results were reviewed by both supervisors, and any differences in application were resolved through discussion until consensus was reached.

5.3 Findings

Table 5-1 reports the coding results across the 44 critical thinking syllabuses.

Table 5-1 Coding results

Dimension	Theme	Number of Syllabuses	Percentage (%)
Purpose	Develop Analytical Skills	44	100%
	Effective Communication	34	77%
	Enhanced Learning	26	59%
	Develop Critical Thinking Dispositions	26	59%
	Better Decision Making	25	57%
	Civic Engagement	15	34%
	Develop Creativity	12	27%
Content	Argument Analysis	38	86%
	Foundations and Importance of Critical Thinking	36	82%
	Academic Development	33	75%
	Fallacies	31	70%
	Dialogue and Communication as Content	25	57%
	Problem Solving	19	43%
	Critical Thinking Dispositions as Content	13	30%
Method	Active Learning	33	75%
	Oral Learning	32	73%
	Collaborative Learning	30	68%
	Written Learning	30	68%

	Technology-Enhanced Learning	29	66%

To refine the analysis of critical thinking content, the coding results were reclassified as follows: ‘Standard’ for elements present in 80-100% of the syllabuses, indicating a high level of consensus; ‘Frequent’ for elements occurring in 50-80% of the syllabuses, reflecting common content; ‘Non-standard’ for elements found in 20-50% of the syllabuses, representing less common content; and ‘Uncommon’ for elements appearing in 0-20% of the syllabuses, which may include unique or rare content.

It is also important to note that several themes sit near category thresholds. For example, Effective Communication as a stated purpose appears in 34 of 44 syllabuses (77%). This places it in the Frequent category but very close to the Standard boundary. A similar near-borderline pattern is visible in some method themes. Such cases are treated as high-frequency emphases that may plausibly be interpreted as near-standard elements of the explicit curriculum, even if they do not meet the threshold numerically. The tiering scheme is therefore used flexibly to support interpretive precision rather than to impose rigid categorical divisions.

Based on this classification, the purpose dimension contains one Standard element: Develop Analytical Skills at 100%, while Effective Communication (77%), Enhanced Learning (59%), Better Decision Making (57%) and Develop Critical Thinking Dispositions (59%) fall within the Frequent range, and Civic Engagement (34%) and Develop Creativity (27%) fall within the Non-standard range. In the content dimension, Foundations and Importance of Critical Thinking (82%) and Argument Analysis (86%) are Standard, with Academic Development (75%), Fallacies (70%) and Dialogue and Communication as Content (57%) positioned in the Frequent band, and Problem Solving (43%) and Critical Thinking Dispositions as Content (30%) situated within the Non-standard tier. In the method dimension, Active Learning (75%) appears in 33 syllabuses, placing it at the upper end of the Frequent range and close to the Standard threshold. Oral Learning (73%), Written Learning (68%), Collaborative Learning (68%) and Technology-Enhanced Learning (66%) likewise fall within the Frequent band, indicating that dialogic, written, group-based and

digitally supported activities are widely used to operationalise critical thinking pedagogy.

Taken together, these distributions indicate that while the overall pattern of purposes and content closely parallels the scoping review in Chapter Three, the syllabus dataset also displays genre-specific features that shape how these themes are expressed. To understand these differences more clearly, the following sections examine how teaching purposes, content, and methods are articulated at syllabus level and how their phrasing differs from the more expansive descriptions found in the review literature.

5.3.1 Teaching purposes

In the scoping review in Chapter Three, teaching purposes are usually described in terms of broad goals and educational aspirations. By contrast, course syllabuses tend to highlight what is taught in the course and how learning is expected to be assessed. Against this background, one of the most notable additional insights from the syllabus analysis is that Effective Communication is mentioned much more often than in the research literature. In the scoping review in Chapter Three, Effective Communication appeared in only 28% of studies. However, in this chapter's syllabus dataset, Effective Communication appears in 34 of the 44 syllabuses (77%), meaning that it comes close to standard status as a syllabus-level course purpose. This increase is likely linked to the way syllabuses are written. At course level, Effective Communication is often emphasised in university-programme and graduate attribute-level frameworks, and is then transferred into course documents as an expected educational outcome.

This broader institutional framing is visible in several cases. Michigan State University presents Effective Communication as a key institutional learning goal, while the course syllabus expresses this more indirectly through outcomes related to argument analysis and students' ability to use reasoned argument to communicate more clearly and effectively in their own writing and expression. The University of Queensland similarly links clearer expression, persuasive argumentation, and academic writing to the university's graduate attribute of Effective Communication. West Coast University also places effective written and oral communication alongside critical reasoning within its general education framework,

and this emphasis is carried into the critical thinking course syllabus through course-level aims related to communication and reasoning. These examples suggest that the prominence of Effective Communication in syllabuses is connected not only to course design, but also to the way communication is embedded in wider institutional frameworks and then articulated through course-level aims.

At the same time, syllabus statements suggest that Effective Communication is often expressed at course level through argumentation rather than as a wholly separate purpose. In other words, it commonly appears in forms such as clearer expression, better writing, more persuasive reasoning, and more effective participation in discussion. This helps explain why it becomes more visible in syllabuses than in the scoping review: communication is supported from above through graduate attribute and general education frameworks, but it is also readily translated into course-level outcomes through the teaching of argument analysis, writing, and discussion. Its stronger presence at syllabus level therefore appears to reflect both wider institutional endorsement and its close fit with the communicative dimensions of critical thinking pedagogy.

Civic Engagement and Develop Creativity are mentioned less often than most other teaching purpose themes as direct course purposes in syllabuses. This pattern offers a complement to the scoping review and may point to two related interpretations. On the one hand, these two purposes are also relatively uncommon in the review, which suggests that they are not among the most frequently prioritised aims in critical thinking education. Since research articles often highlight innovative or distinctive teaching aims, their limited presence in that literature further supports the view that they occupy a less central position in stand-alone critical thinking teaching. On the other hand, the syllabus analysis indicates another possibility: civic and creativity-related aims are often stated in broader university or programme documents, such as general education frameworks, programme goals, or graduate attributes, rather than repeated as explicit aims in every stand-alone critical thinking course. In this sense, their lower frequency at course level does not necessarily mean that courses do not value these aims. It may instead reflect a division of labour in curriculum writing, where higher-level documents set wider social and creative aspirations, while

individual courses provide support for them in ways that align with their specific discipline.

This layered arrangement can be seen in the texts of particular institutions. At San José State University, the general education framework highlights ethical judgement, responsible participation in a diverse society, and progressively more complex and creative analysis and expression. However, the A3 course-level outcomes place greater emphasis on goals more directly related to critical thinking, such as searching for evidence, constructing arguments, applying rhetorical and logical strategies, and using deductive and inductive reasoning. The University of Queensland shows a similar pattern. Its graduate attributes include Independence and Creativity and Ethical and Social Understanding, which covers social and civic responsibility, yet the mapped course aims and outcomes focus aligned critical thinking skills such as critical judgement, problem framing, and argument-based reasoning.

5.3.2 Teaching content

In Chapter Three, Foundations and Importance of Critical Thinking is a low-frequency theme. However, the review has already noted that this is likely because the theme is so fundamental that many published studies do not restate it explicitly. The syllabus evidence is consistent with this interpretation. In this dataset, 36 of the 44 syllabuses include this theme. Introductory definitions are so basic to stand-alone critical thinking courses that some documents may not repeat them in detail once the course is already labelled as ‘critical thinking’ or ‘critical reasoning’. This pattern suggests that syllabuses may be more likely than research texts to state common-sense or baseline content clearly, because they need to provide a complete and accessible overview for students and quality assurance purposes.

Argument analysis is the other Standard content element in the sample, stated in 38 of the 44 syllabuses. This frequency indicates that argument-centred content is widely prioritised in formal course outlines. More importantly, the syllabus evidence helps to clarify its formal curricular centrality in ways that the scoping review cannot show as clearly. The review lists a range of content themes reported in published studies, but the syllabuses make it easier to see how these themes are organised within an actual course structure. In many syllabuses, argument analysis does not appear as one topic among others. This can be seen clearly in the

University of Richmond syllabus, which states that the course focuses on students' ability to understand, evaluate, and reconstruct arguments. On that basis, writing, dialogue, and Problem Solving are not treated as separate strands of content, but are organised as ways for students to practice these core argumentative abilities: class discussion centres on mapping and evaluating arguments, problem sets require argument maps and written evaluations of arguments. A similar pattern appears in the Macalester College syllabus, where learning goals centred on understanding, analysing, and reconstructing arguments are carried into writing assignments and class discussion that require students to respond to, assess, and formulate arguments in public contexts. This suggests that the explicit curriculum of stand-alone critical thinking courses is not only argument-focused in terms of topic frequency, but also argument-centred in terms of how other content areas are positioned and explained within course documents.

A difference from the scoping review concerns the relative prominence of several content themes that appear less often in published studies. In the scoping review, Problem Solving (28%), fallacies (25%), Dialogue and Communication as Content (22%) and Academic Development (22%) are all lower-frequency themes. In the syllabus dataset, these themes appear much more often. Academic Development appears syllabuses in 33 of 44 (75%), Fallacies in 31 of 44 (70%), Dialogue and Communication as Content in 25 of 44 (57%) and Problem Solving in 19 of 44 (43%). This shift supports a more specific reading of how course-level content is built in practice. The syllabuses suggest that these themes are often written as teachable extensions of an argument-centred core.

Academic development, for example, is often articulated as a discipline-specific application of argument skills rather than a generic study-skills unit. University of Adelaide frames essay tasks around evaluating claims against explicit standards of evidence and inference. Douglas College similarly emphasises that academic performance in the course is assessed through argument-driven writing tasks, implying that 'academic development' is operationalised through the demonstrable use of argument analysis in formal academic genres.

Fallacies are also frequently included in syllabuses, but their significance here lies less in

their presence as a separate topic than in how they are positioned within the course structure. In the examples examined, they are usually introduced through broader units on argument evaluation and reasoning rather than treated as isolated lists of common errors. Michigan State University describes how the course introduces principles of argument evaluation and then addresses fallacies related to different aspects of that evaluation, alongside standards of inferential strength and specific argument types such as analogical, statistical, and causal arguments. The City University of New York similarly links fallacy recognition to broader competencies in informal and formal reasoning. The American Public University System sets out a comparable relationship by placing fallacies within a broader unit on deductive and inductive reasoning and requiring students to identify fallacies in varied media. In these cases, fallacies appear not as a detached topic, but as part of the broader work of learning how to evaluate arguments.

Dialogue and communication as Content are also frequently described through an argument-focused lens. Simon Fraser University positions classroom discussion as a space for testing reasons and responding to objections, and University of the Sunshine Coast highlights oral activities that require students to present, defend, and revise positions considering counter-arguments. In these cases, the syllabuses suggest that dialogic competence is cultivated as a structured argumentation practice rather than an isolated communication skills.

Problem Solving, when present, is often framed as a form of applied reasoning. University of Victoria connects problem scenarios to the evaluation of alternative solutions using reasons and evidence, while the University of Richmond emphasises decision-making tasks that require students to justify outcomes through explicit inferential steps. This suggests that Problem Solving in these syllabuses is typically framed not as a free-standing practical skill, but as a process of comparing alternatives, weighing reasons and evidence, and justifying conclusions.

Overall, the syllabus evidence adds two clear points that extend the scoping review. First, course outlines seem more likely than research texts to state basic or common content directly, such as definitions and the importance of critical thinking. This is to be expected

because syllabuses need to give students a complete and easy-to-follow overview. Second, the syllabuses do more than confirm that argument analysis is the most common topic; they also show more clearly how the content is arranged in practice. Several themes that appear less often in published studies, including Academic Development, Fallacies, Dialogue and Communication as Content, and Problem Solving, are often written as practical extensions of an argument-centred core. In this way, the syllabuses show not only what is taught, but also how stand-alone critical thinking courses are built around argument skills as the main organising line for related competencies and assessments.

5.3.3 Teaching methods

After applying the same five teaching-method codes used in the scoping review, the syllabus data shows more clearly how critical thinking courses organise learning activities in everyday teaching. Active learning remains the most common method (33/44). Oral learning (32/44), collaborative learning (30/44), written learning (30/44), and technology-enhanced learning (29/44) also appear in a large share of the syllabuses. Compared with the scoping review, where active learning stands out far more than the other methods, the syllabuses show a more balanced pattern. It is highly likely that research articles often concentrate on practices that authors see as especially new or distinctive, while syllabuses need to help students understand how the course will run, what activities they will complete, how they should participate, and how tasks are linked to assessment.

From this point, the stronger presence of written, collaborative, and technology-supported activities in syllabuses is likely to reflect their stable place in routine course design. Written learning is a good example. In many higher education settings, students are expected to demonstrate critical thinking through structured argument work, and writing is a practical way to make reasoning explicit, checkable, and assessable. This helps explain why written tasks often occupy a central place in course assessment, even when research articles do not always dwell on them. In the University of Toronto syllabus, students build one full writing assignment in stages, revising earlier work in response to feedback and being graded for both the quality of submission and the quality of revision. The University of Richmond syllabus reinforces this pattern by requiring regular problem sets that typically include argument

maps and written evaluations of arguments, as well as a substantial argumentative essay of around 2500 words accompanied by an argument map. London Metropolitan University likewise places written coursework at the core of summative assessment. These examples support the expectation that writing is not simply an optional add-on but a common way for critical thinking courses to train and evaluate students' reasoning in a sustained and structured form.

The syllabuses also offer a perspective that is harder to capture in the scoping review, namely the combined structure of teaching methods. Many of the studies in the scoping review focus on a single, innovative teaching practice, whereas the syllabuses show that multiple teaching methods are often used in combination and sometimes within the same learning activity. Among the 44 syllabuses, 19 identify all five methods. This suggests that many courses do not rely on a single pathway. Instead, they draw on several methods together to support critical thinking learning. In these documents, oral discussion, writing tasks, group work, and digital tools appear not simply as separate elements, but as interconnected parts of a shared pedagogical design. For example, London Metropolitan University states that the module runs through taught classes, seminars, and debates. Class work includes individual, pair, and group activities, and students are expected to produce, present, and discuss both oral and written work. The syllabus also explains that materials, practice activities, feedback, and online discussions are supported through the Virtual Learning Environment (VLE), and that peer assessment is used for formative feedback. A similar multi-method design appears in Macquarie University's syllabus, which combines online quizzes, a reflective writing task (Personal Argument), peer review, a Final Scenario Report, and online engagement tasks. The University of Richmond also integrates argument mapping supported by an online programme with frequent in-class practice and later debates. These examples suggest that syllabuses show not only which methods are used, but also how they are combined within tasks and activities to shape the overall organisation of learning activities and support course learning goals.

At the same time, many syllabuses mention teaching methods only briefly, and a small number do not clearly identify any of the five categories. As noted earlier, this limited detail

may reflect differences in document length, institutional template, and writing style rather than clear evidence that a method was absent from teaching. Birkbeck's syllabus is an example of a concise format. It focuses on course content and assessment structure, summarising assessment as four short tasks in analysis and argument construction, while giving little detail about classroom activities or digital arrangements. Therefore, this chapter interprets 'absence' or 'low frequency' with caution, and the finer details of teaching methods may require further investigation.

5.4 Discussion

The discussion focuses on three ideas that will be examined further in the following chapters, first through comparison with Chinese critical thinking syllabuses and later through textbook analysis. The first concerns the curricular centrality of argument analysis. The second relates to the extension themes that appear more prominently in syllabuses than in the scoping review. The third relates to the pattern of multi-method teaching that becomes more visible at syllabus level and suggests a potentially distinctive mode of stand-alone critical thinking design.

The first idea extends the analysis from frequency counts to an argument about curricular structure and weight. The syllabus evidence supports a stronger claim than the scoping review alone can justify. Argument analysis may function as the central organising line of stand-alone critical thinking courses. This idea is supported not only by its high occurrence across syllabuses, but also by the amount of course space and detail that many documents allocate to argument-related topics, learning outcomes, and assessments. In several syllabuses, the description of weekly topics, learning objectives, and graded tasks repeatedly returns to identifying, reconstructing, and evaluating arguments, while other elements such as dialogue, academic reading or writing are introduced through that same frame. In this sense, argument analysis appears to carry both structural priority and substantive teaching weight. If this reading is accurate, textbooks should show more than a simple presence of argument chapters. They should devote sustained space to argument structure, standards of inference, and the assessment of premise acceptability, relevance, and evidential support, and these components should anchor later (or other) material. The early part of a textbook

would be expected to establish core argument tools and reasoning standards, with later units on fallacies, academic development, dialogue, or Problem Solving building on these tools. Task design should also reflect this dependency, e.g. critical reading exercises should require students to reconstruct arguments; writing tasks should be evaluated against clear standards of inference and evidence; and dialogue activities should be organised around reason giving and rebuttal. If textbooks do not allocate comparable depth and sequencing to argument work, the syllabus emphasis may reflect how the course is formally described rather than an internally coherent instructional architecture.

The second idea concerns the status of extension themes that appear more fully mapped in syllabuses than in the scoping review, including Academic Development, Dialogue and Communication as Content, and Problem Solving. While the syllabus dataset documents these elements as routine parts of course content, this does not necessarily signal a new agenda beyond the review framework. Rather, it suggests that course documents may present a fuller list of 'everyday but important' learning topics and outcomes because they are required to outline a complete course map for students and institutional review. Whether these themes carry deep instructional weight still requires confirmation through textbooks. If they are central to course design, textbooks should assign them a clear structural place within the argument-centred pathway. Fallacies should be treated as systematic components of argument evaluation rather than short lists at the margins. Academic development should be expressed through tasks that ask students to construct and assess scholarly positions using explicit reasoning criteria. Dialogue and Communication as Content should be scaffolded through structured response and rebuttal practice. Problem Solving should be developed through strategies such as defining the problem, generating alternative solutions, evaluating arguments for different courses of action, and judging which option is best supported by reason and evidence.

A third, related idea arises from the teaching method profile. The syllabus dataset suggests that stand-alone critical thinking courses are often designed through the combined use of multiple teaching methods rather than around a single dominant mode of delivery. Active learning, oral learning, written learning, collaborative learning, and technology-enhanced

learning frequently appear together within the same course documents. This pattern suggests more than simple variety. It may indicate a deliberately layered pedagogy in which different methods serve different functions in the development of argument competence. Active learning may supply the practice space in which reasoning is tested. Oral formats may support real-time articulation and challenge. Writing may provide space for extended justification and for the articulation and evaluation of premises. Collaboration may expose students to alternative viewpoints and create a heightened need to engage with, respond to, and question these divergent positions. Digital tools may extend these processes across time and provide structured prompts for repeated practice. This is a plausible reading of the syllabus pattern, but it remains a cautious one. Some of this method clustering may be shaped by standard course templates or common institutional wording. The value of the syllabus evidence is that it makes this multi-method arrangement easier to notice as a possible design feature of stand-alone critical thinking teaching.

Textbook analysis provides a concrete way to test whether this multi-method pattern reflects a real learning architecture. While syllabuses suggest that multiple methods are combined within courses, textbooks can show more clearly how different forms of learning are sequenced and connected in practice. If this pattern is substantive, textbooks should not only present concepts but also provide linked practice opportunities across different modes of learning, such as guided reconstruction tasks, discussion prompts, extended writing, peer review, and revision. The presence of such connections would support the claim that method plurality is not merely listed in course documents but is built into the instructional logic of the course. If these links are weak or missing, the method profile in syllabuses may reflect a genre of institutional documentation more than a stable pedagogical design principle.

Taken together, these ideas position the syllabus analysis as an interpretive bridge between research discourse and the design signals of formal curriculum documents. The chapter confirms convergence with the scoping review on the centrality of arguments to critical thinking. It also advances a more structural claim that argument analysis may function as a capability spine with substantial content weight and sequencing priority, and it identifies extension themes and multi-method patterns that require verification through textbooks. The

next chapter therefore turns first to Chinese critical thinking syllabuses in order to examine these patterns comparatively, while a later textbook chapter tests these claims with close attention to conceptual depth, topic ordering, and the design of practice tasks that indicate whether syllabus-level signals translate into sustained learning pathways.

5.5 Chapter summary

This chapter has examined how critical thinking is formally articulated in stand-alone courses in Western higher education through the thematic analysis of 44 course syllabuses from Australia, Canada, the United Kingdom, and the United States. Building on the scoping review in the previous chapter, it used the same coding framework to analyse teaching purposes, content, and methods, thereby enabling a more direct comparison between the published literature and formal course documents.

The findings show a substantial degree of continuity with the scoping review, while also revealing several features that become more visible at syllabus level. Across the dataset, the most stable teaching purpose is the development of analytical skills, which appears in all 44 syllabuses. In addition, effective communication, enhanced learning, better decision making, and the development of critical thinking dispositions emerge as frequent purposes, although with lower consistency. In the content dimension, foundations and importance of critical thinking and argument analysis appear as the clearest standard elements. At the same time, Academic Development, Fallacies, Dialogue and Communication as Content, and Problem Solving are more prominent in syllabuses than in the review literature. In the method dimension, active learning remains the most common teaching method, but syllabus evidence also shows that oral learning, written learning, collaborative learning, and technology-enhanced learning appear frequently and often in combination.

Taken together, these findings support three broader interpretations. First, the syllabus evidence strengthens the claim that argument analysis may function as the curricular spine of stand-alone critical thinking courses in Western higher education. It appears not only as a highly frequent theme, but also as the organising line through which other elements such as fallacies, academic reading and writing, dialogue, and Problem Solving are often framed.

Second, the syllabus data suggests that course documents tend to present a fuller map of routine but important content than the research literature, especially in relation to extension themes such as academic development and dialogue. Third, the combined presence of multiple teaching methods indicates that stand-alone critical thinking courses may often be designed through a layered pedagogy rather than a single dominant instructional mode. In this respect, syllabus analysis adds a structural perspective that is less visible in studies focusing mainly on isolated teaching interventions.

At the same time, the chapter also has important limitations. Most fundamentally, syllabuses reflect the formal and explicit curriculum rather than the full complexity of classroom practice. They indicate what courses officially claim to teach, but they do not necessarily show how concepts are explained in depth, how topics are sequenced in practice, or how teaching methods are enacted in real classrooms. The level of detail also varies considerably across institutions. Some syllabuses provide extensive information about weekly topics, assessment, and teaching arrangements, whereas others are relatively brief and provide only limited curricular detail. As a result, the absence or low frequency of a theme in the dataset cannot be taken straightforwardly as evidence that it is absent from teaching itself. The findings therefore need to be interpreted as evidence of formal curricular priorities rather than complete representations of enacted pedagogy.

A further limitation is that syllabus analysis can show the presence of content areas and methods but cannot by itself fully determine their instructional weight or internal sequencing. For example, while argument analysis appears highly central, syllabus documents alone cannot necessarily confirm whether it genuinely anchors the conceptual progression of the course, or whether some other dimensions become more important in actual teaching materials. Similarly, although the frequent co-occurrence of multiple teaching methods suggests a potentially meaningful multi-method design, syllabus statements do not always provide enough detail to distinguish between parallel listing and a more coherent pedagogical architecture. These limitations mean that the present chapter should be read as identifying strong design signals rather than as establishing the full structure of teaching and learning.

These limitations also point directly to the rationale for the next chapter. If the present chapter identifies the explicit priorities of Western stand-alone critical thinking courses, the following chapter extends the analysis through comparison with Chinese critical thinking syllabuses. This comparison is important for two reasons. First, it allows the thesis to examine whether the central patterns identified here, especially the prominence of analytical skill development, argument-centred content, and multi-method pedagogy, also appear in Chinese higher education. Second, it creates a comparative basis for identifying both shared priorities and significant differences between the two contexts. In particular, the Western syllabus analysis provides a reference point against which the Chinese data can be examined in terms of how purposes are framed, how content is organised, and how teaching methods are formalised or left implicit.

The next chapter therefore moves from within-context mapping to cross-context comparison. By analysing Chinese critical thinking syllabuses through the same thematic framework, it becomes possible to assess which elements of Western stand-alone critical thinking teaching appear transferable, which appear context-specific, and where the Chinese syllabus data suggests different curricular emphases or organisational logics. In this way, the transition to the next chapter is not simply geographical. It advances the central aim of the thesis by using the Western findings as an analytical baseline for exploring how critical thinking is formally constructed in Chinese higher education and for considering what this comparison may imply for future curriculum development.

Chapter Six: Thematic analysis of critical thinking course syllabuses in Chinese universities

6.1 Introduction

This chapter examines how critical thinking is presented at course level in Chinese higher education through a thematic analysis of university course syllabuses. It focuses on how critical thinking is prioritised and organised within formal course documents. In earlier chapters, this thesis reviewed research on critical thinking in Western and Chinese higher education in order to identify dominant teaching purposes, content, and methods. That review showed that research on critical thinking has been well developed in Western contexts, while Chinese related critical thinking research remains at a relatively early stage. In particular, Chinese studies have tended to focus less on course-level articulation of critical thinking teaching, and more on clarifying its educational role and significance within higher education. For this reason, the study does not rely on Chinese research literature alone to understand how critical thinking is taught in Chinese universities. Instead, it examines course syllabuses as a key source of evidence for how critical thinking is formally incorporated into university curricula in China (Parkes & Harris, 2002; Habanek, 2005).

As in Chapter Five, course syllabuses are treated here as formal documents that indicate how critical thinking is framed at course level. Analysing Chinese course syllabuses makes it possible to examine which elements of critical thinking are explicitly stated at course level, and which receive less attention or remain implicit. This chapter builds on the earlier analysis of Western critical thinking course syllabuses. The same analytical dimensions of teaching purposes, teaching content, and teaching methods are used in order to support comparison across contexts. Using a shared framework allows the study to examine how teaching elements identified in Western research and practice appear, or do not appear, in Chinese course documents.

The aim of this chapter is not to assess whether Chinese courses follow Western models, nor to judge the quality of individual course designs. Rather, it seeks to describe how critical

thinking is presented in Chinese course syllabuses, how Western-derived teaching elements are selected or reinterpreted at course level in China, while also allowing for the possibility that Chinese courses may contain distinct elements of their own.

In the context of Chinese higher education, course syllabuses often serve more than a technical teaching function (Parkes & Harris, 2002). Alongside outlining teaching arrangements, they frequently indicate how a course contributes to broader educational aims at both institutional and national levels, such as student skills development, talent cultivation, and wider higher education priorities. As a result, statements about critical thinking in Chinese syllabuses may combine references to specific skills with more general claims about the educational role of the course. This chapter examines how these different types of statements appear in Chinese course syllabuses and how they are distributed across teaching purposes, content, and methods. By doing so, it provides a course level picture of how critical thinking is formally described in Chinese higher education.

To support comparison with the Western syllabus analysis, the chapter applies the same analytical framework and coding approach to the Chinese syllabus dataset. As with the Western syllabuses, it is important to note that differences in syllabus length, level of detail, and institutional templates will affect how much information can be gathered about teaching and learning (Habanek, 2005). Therefore, the absence of a theme in a syllabus should not be taken to mean that it is absent from teaching.

Within the overall structure of the thesis, this chapter provides course level evidence from the Chinese higher education context. Together with the earlier analysis of Western syllabuses, it contributes to a broader examination of how critical thinking teaching elements are defined and enacted. The findings of this chapter are later considered alongside both the findings from the previous chapter and an analysis of Chinese national education policy in order to assess which teaching elements, derived from Western critical thinking traditions, are workable and educationally meaningful in the Chinese context. In this way, the analysis of Chinese course syllabuses forms an important part of the evidence base used to develop the conceptual framework for critical thinking instruction presented at the end of the thesis.

6.2 Data sources and analytical approach

This chapter draws on a dataset of 18 publicly available course syllabuses from Chinese universities. All syllabuses were obtained from official university websites or publicly accessible course documentation platforms. The analysis continues the abductive thematic approach and applies the coding framework developed through the scoping reviews. Full details of the coding procedures are reported in the Methodology chapter.

Coding was organised around three analytical dimensions: teaching purposes, teaching content, and teaching methods. These dimensions were derived from the scoping reviews and applied abductively to the Chinese syllabus dataset. Any aspects that did not meet those dimensions were also noted, including differences or gaps with the Western syllabuses, making for a comparative examination. Each syllabus was read in full, and relevant statements were coded according to these dimensions. The complete coding table is provided in the Appendix E2. This table documents the evidence base for interpretation and includes the original syllabus excerpts, the corresponding theme labels, and the location of each excerpt within the syllabus text. Where relevant, brief coding notes clarify how individual excerpts were assigned to specific themes within the review-derived framework. The coding template and pilot coding results were reviewed by both supervisors, and any differences in interpretation were discussed and resolved through agreement.

6.3 Findings

6.3.1 Overview of Chinese course syllabuses

This section summarises the institutional and document characteristics of the 18 Chinese course syllabuses included in the analysis. The dataset includes syllabuses from both Double First-Class universities and non-Double First-Class institutions. The Double First-Class initiative is a Chinese government scheme intended to support the development of leading universities and disciplines (The State Council of the People's Republic of China, 2022). Double First-Class status is commonly used as a policy marker of targeted national support and institutional capacity, because inclusion in the scheme is linked to government priorities and funding (Peters, 2018; Packer, 2024). Further details of the Double First-Class content are discussed in Chapter Nine on Chinese national education policy analysis. Using this

classification, thirteen of the eighteen syllabuses come from Double First-Class universities, and five come from non-Double First-Class institutions. In addition, seventeen of the eighteen institutions are public universities, and one is a private university. The private institution in this dataset is Shanghai Jian Qiao University. In Chinese higher education, public universities are established and run by the state, while private institutions are run by non-state organisations or individuals and are typically not funded in the same way as public universities. This difference in funding structure and oversight is one reason why public universities are often regarded as having stronger and more stable institutional resources than private institutions, although this does not in itself determine teaching quality (Liu et al., 2022).

Course status is rarely stated directly in the syllabus materials collected for this study. None of the eighteen syllabuses explicitly label the course as compulsory, and none explicitly label it as elective in the text segments available in the dataset. Instead, course positioning is typically communicated indirectly through labels such as ‘public foundation course’, ‘ability training course’, or ‘first-year seminar’, or through the type of skills and topics emphasised in the syllabus. Two syllabuses explicitly describe the course as a broad access provision, with one presented as a public foundation course and one presented as a first-year seminar. Beyond these explicit labels, syllabus content also provides a basis for a cautious inference about likely course function. Thirteen of the eighteen syllabuses emphasise general critical thinking skills and transferable academic abilities, which suggests that they are likely to function as general education or university wide elective provision. These syllabuses often foreground argument evaluation, clear thinking, decision making, academic reading and writing, communication, presentations, or language related applications. Five of the eighteen syllabuses are strongly logic centred, with extended sequences on formal logic, deduction and induction, syllogistic reasoning, truth functional logic, or specialised inference forms. This pattern suggests that these courses may be more closely linked to disciplinary provision in logic or philosophy, and they may operate as specialised electives or programme linked requirements.

The syllabuses also vary considerably in document length and level of detail. Four of the

eighteen syllabuses are short documents with minimal outline information. One short example - the Shanghai Tech University entry - provides no topic outline at all. A second short example - the China Agricultural University - lists only a small number of topics, with only seven brief items. The remaining syllabuses provide medium length or detailed topic lists, often structured as chapters, units, or weekly themes.

6.3.2 Coding results

Table 6-1 reports the coding results across the 18 critical thinking syllabuses in Chinese universities.

Table 6-1 Coding results

Dimension	Theme	Number of Syllabuses	Percentage (%)
Purpose	Develop Analytical Skills	16	89%
	Better Decision Making	11	61%
	Enhanced Learning	10	56%
	Develop Critical Thinking Dispositions	10	56%
	Effective Communication	10	56%
	Develop Creativity	7	39%
	Civic Engagement	3	17%
Content	Foundations and Importance of Critical Thinking	17	94%
	Argument Analysis	16	89%
	Fallacies	13	72%
	Academic Development	9	50%
	Problem Solving	7	39%
	Critical Thinking Dispositions as Content	5	28%
	Dialogue and Communication as Content	4	22%

Method	Active Learning	9	50%
	Oral Learning	7	39%
	Written Learning	4	22%
	Collaborative Learning	4	22%
	Technology-Enhanced Learning	1	6%

Building on the tiering approach established in the analysis of Western course syllabuses, the Chinese syllabus coding results were also organised using frequency-based categories. Elements were classified as Standard when they appeared in 80-100% of the syllabuses, Frequent when present in 50-80%, Non-standard when occurring in 20-50%, and Uncommon when found in fewer than 20% of the syllabuses. Applying the same classification scheme enables direct comparison across datasets while maintaining consistency in analytical criteria.

At the same time, the smaller size of the Chinese syllabus dataset requires careful interpretation of category boundaries. As in the Western analysis, several themes fell near threshold values rather than falling cleanly within discrete categories. In such cases, frequency levels are treated as indicative rather than absolute, recognising that themes positioned close to category cut-offs may function similarly within the explicit curriculum. For instance, Fallacies as a content area occurs at the upper end of the Frequent range and lies close to the Standard boundary, indicating a widely shared curricular emphasis despite narrowly missing the formal criterion. This flexible use of the tiering scheme allows comparison with the Western syllabus dataset, while taking into account differences in how Chinese courses are documented.

Against this classification, Table 6-1 shows which themes are most consistently stated in the Chinese syllabuses and which appear only in a smaller set of courses. At the Standard tier, the clearest consensus is in the content dimension: most syllabuses include foundational introductions to critical thinking (94%) and explicit coverage of argument analysis (89%). A similarly strong pattern is visible in the purpose dimension, where developing analytical skills is stated as a central course aim in the large majority of documents (89%). Fallacies

also sit at the upper end of the Frequent range (72%) and lie close to the Standard boundary, suggesting that identifying fallacious reasoning and evaluating arguments are treated as key content areas even when the numerical threshold is narrowly missed.

By contrast, the method dimension shows less consistency. No method theme reaches the Standard tier, and only active learning meets the Frequent threshold (50%); other approaches are reported more selectively, including oral learning (39%), written learning (22%) and collaborative learning (22%), with technology-enhanced learning rarely stated (6%). This pattern should not be read as evidence that interactive or technology-supported teaching is absent in practice. Rather, it indicates that Chinese course documents tend to specify learning content and outcomes more consistently than they describe how teaching and learning activities are organised. Civic engagement is also rarely stated as an explicit purpose (17%), indicating that this emphasis is not commonly foregrounded in course-level documentation.

Within the review-derived purpose, content, and method framework, no additional themes were identified in the Chinese syllabus dataset beyond those captured in Table 6-1. This may suggest that, at the level of general purposes, content areas, and teaching methods, Chinese and Western critical thinking courses share broad similarities. It may also reflect the character of publicly available syllabuses, which often rely on standard headings and concise descriptions and therefore may not make more context-specific emphases fully visible. The following sections examine, at syllabus level, how teaching purposes, content emphases and method statements are written in Chinese course documents.

6.3.2.1 Teaching purposes

Across this dataset, stated teaching purposes align closely with the purpose themes used in the scoping reviews and in the Western syllabus analysis. Unlike the scoping review findings in Chapter Three and Four, many syllabuses state teaching purposes in concrete terms, including improving students' ability to analyse and evaluate, improving decision-making, and strengthening students' ability to express and defend ideas in speech or writing. For example, the Fudan University course description defines critical thinking as thinking about what to believe or do and specifies course aims such as understanding, analysing, evaluating,

and reconstructing arguments. Huaqiao University similarly presents the course as building 'good thinking skills' and links these aims to making rational decisions in contexts such as everyday life, work, research, business, and legal or ethical settings. Further detail and supporting excerpts are provided in the coding table in the Appendix E2 and in the earlier scoping review chapters, which document how these purpose statements map onto the review-derived framework.

Two differences are visible in how Chinese syllabuses phrase these purposes. First, although Develop Analytical Skills is the most frequently coded purpose theme (16/18), a subset of syllabuses specify 'analytical skills' primarily as formal-logic argument competence rather than as informal argument evaluation in everyday discourse. Five of the eighteen syllabuses present Develop Analytical Skills in this way. In these cases, analytical development is linked to aims such as improving logical argument power or training reasoning through formal procedures and standards associated with logic (e.g., validity testing, truth-functional reasoning, syllogistic forms). For instance, the Dongguan University of Technology syllabus positions the course under the idea of the 'modernisation of logic' (逻辑现代化) and states aims focused on strengthening students' formal logic power. The University of Chinese Academy of Sciences syllabus similarly states that critical thinking skills depend on formal logical reasoning and argumentation and that critical thinking cannot be developed without formal logic as a foundation. Renmin University of China, Sun Yat-sen University, and Dalian University of Technology syllabuses further place formal logic training at the centre of the stated course purpose through an explicitly logic-led framing. Formal logic and informal logic serve different functions in critical thinking education, and while formal logic can support critical thinking, an overemphasis on it may raise concerns. This issue is examined further in Chapter Ten.

Second, while Develop Critical Thinking Dispositions appears in ten of the eighteen syllabuses, disposition aims are typically stated in broad terms and are not operationalised through named disposition constructs. In contrast to the more explicit disposition lists commonly used in Western critical thinking frameworks (for example, the Delphi Report and Ennis provide explicit disposition lists), Chinese syllabuses tend to describe dispositions

through general qualities or expectations. The Shanghai Tech University syllabus, for example, states that students are expected to develop a ‘prudent and holistic approach to thinking’ (审慎与全面的思考态度). China Agricultural University similarly links critical thinking education to worldview, outlook on life, and values. These statements indicate an intention to shape attitudes and habits, but they provide limited specification of particular disposition components.

6.3.2.2 Teaching content

The main content areas correspond to the content framework developed in the scoping review. Across the syllabuses, common elements include introductory work on what critical thinking is and why it matters, argument analysis, fallacies, problem solving, and, in some cases, academic reading and writing. However, as noted in the preceding subsection on teaching purposes, many Chinese syllabuses specify the development of ‘analytical skills’ in ways that closely align with formal-logic argument competence. In line with that purpose orientation, content descriptions often operationalise ‘analysis and evaluation’ through rule-based and testable procedures associated with formal logic, rather than focusing primarily on informal evaluation of everyday arguments.

In terms of content organisation, several syllabuses place formal and symbolic tools at the centre of the learning pathway, presenting analysis as a set of calculable operations. The Renmin University of China syllabus treats logic and critical thinking as an integrated training sequence and includes major units on transformational reasoning, truth tables and related methods, and reasoning with compound propositions. The course developed jointly by Sun Yat-sen University and Dalian University of Technology similarly foregrounds truth functions and truth tables and introduces diagrammatic tools such as Venn and Euler diagrams to support judgements about propositional relations and inference structure. In these documents, formal rules, symbolic representation, and decision procedures are not presented as minor supporting topics but as prominent components through which argument work is taught.

This formal-logic orientation is also visible in syllabuses that retain a full set of classical

logic units and use these as a main organising principle for course content. The University of Chinese Academy of Sciences, for example, centres its outline on categorical propositions, syllogisms and methods for determining syllogistic validity, and modal propositions. Dongguan University of Technology explicitly frames the course as treating traditional logic from the standpoint of modern logic and presents logic as a practical tool for correct thinking. In such cases, the syllabus structure suggests that critical thinking content is expected to develop through sustained engagement with established logic systems, rather than through a primary focus on everyday argumentation and more flexible evaluation standards.

A related feature is the prominence given to validity as a central criterion in the evaluation of reasoning. In the Tsinghua University syllabus, the argument-related units focus on the validity of reasoning with conditional propositions and valid forms of syllogistic inference. This emphasis places structural correctness at the centre of argument assessment and may reduce the space available in the syllabus outline for other evaluative dimensions often used in everyday argument contexts, such as weighing competing evidence, assessing relevance and strength across uncertain information, or handling counter-arguments in open-ended situations. These statements suggest a local curriculum choice in which the objectivity and checkability of formal logic serve as the main foundation for teaching, with examples and applications used to connect that training to real situations.

It should be noted that this section does not imply that formal logic is irrelevant to critical thinking education. Formal logic provides clear tools for evaluating validity, mapping structure, and applying reasoning rules, and it can support important aspects of critical thinking under certain instructional aims. The point documented here is that in the Chinese syllabus texts analysed, critical thinking content is often organised around formal-logic tools and formal assessment standards, while informal logic and everyday argument evaluation are less visible in the way course content is structured and described. The potential benefits and limits of this orientation are considered further in the Discussion section.

6.3.2.3 Teaching methods

In the teaching-method dimension, the Chinese syllabus dataset does not show method

emphases beyond those already captured in the scoping review framework. Where method information is stated explicitly, it corresponds to familiar approaches such as class discussion, case-based activities, and writing-related tasks. In the present coding results, method themes are less visible in the syllabus texts than purpose and content themes. This distribution suggests that teaching methods are not necessarily absent, but they are often not stated in a consistent and codable way in the syllabus text.

Method reporting is uneven across the dataset. Some documents provide relatively complete topic outlines but give little or no information about how learning activities are organised, which limits the visibility of method themes in coding. The ShanghaiTech University page, for example, offers a course description but does not provide a topic sequence or activity plan, making the method dimension difficult to identify. Similarly, the syllabuses from Renmin University of China and the University of Chinese Academy of Sciences present long and detailed sequences of topics, yet provide very limited description of delivery format. They rarely indicate whether learning is organised through discussion, practice tasks, writing assignments, or collaborative work. In these cases, the content dimension is documented, while the method dimension is not clearly documented.

By contrast, some syllabuses make methods visible through a task-based form of reporting. Instead of describing instructional design, they specify what students are required to do. The Huaqiao University syllabus is an example. Across multiple chapters, it repeatedly states that students are required to participate actively in discussions and provide analyses of relevant phenomena from campus learning and social life. These repeated requirements provide codable evidence for Oral Learning and Active Learning, because they position discussion and in-class analysis as expected learning activities. At the same time, the syllabus does not explain how discussions are structured, how cases are selected, how students' analyses are guided, or how feedback and evaluation are organised (although to some extent, this is true of syllabuses more generally, including those in the Western sample). In this sense, method statements function more as participation rules or minimum learning requirements than as detailed descriptions of pedagogy. As a result, low frequencies in the method dimension should be interpreted cautiously, since they may reflect how syllabuses document learning

activities rather than the actual absence of particular teaching methods.

6.3.2.4 Cross-dataset comparison of purposes, content, and methods

This section compares the Western syllabus dataset (n = 44) and the Chinese syllabus dataset (n = 18) using the same coding framework across teaching purposes, teaching content, and teaching methods (as shown in Table 6-2). The comparison is based on what is stated in course documents. As has been noted, syllabuses provide limited and uneven information, and the absence of a theme in a syllabus does not confirm that the corresponding element is absent from teaching or course design. For this reason, differences greater than 20 percentage points are treated here as notable contrasts for descriptive purposes only. They should, at this stage, be interpreted primarily as differences in what syllabuses choose to document and foreground, rather than as firm evidence that the underlying courses do or do not include these elements. Further investigation would be required to establish whether these gaps reflect substantive curricular differences or documentation practices. The purpose of this subsection is to identify shared curricular features and context-dependent differences that can inform the later consideration of critical thinking course development in Chinese higher education.

Table 6-2 Comparative coding results for Western and Chinese critical thinking syllabuses

Dimension	Theme	China (n = 18)	China %	Western (n = 44)	Western %	Δ (pp)
Purpose	Develop Analytical Skills	16	89%	44	100%	-11
	Better Decision Making	11	61%	25	57%	4
	Enhanced Learning	10	56%	26	59%	-3
	Develop Critical Thinking Dispositions	10	56%	26	59%	-3
	Effective	10	56%	34	77%	-21

	Communication					
	Develop Creativity	7	39%	12	27%	12
	Civic Engagement	3	17%	15	34%	-17
Content	Foundations and Importance of Critical thinking	17	94%	36	82%	12
	Argument Analysis	16	89%	38	86%	3
	Fallacies	13	72%	31	70%	2
	Academic Development	9	50%	33	75%	-25
	Problem Solving	7	39%	19	43%	-4
	Critical Thinking Dispositions as Content	5	28%	13	30%	-2
	Dialogue and Communication as Content	4	22%	25	57%	-35
Method	Active Learning	9	50%	33	75%	-25
	Oral Learning	7	39%	32	73%	-34
	Written Learning	4	22%	30	68%	-46
	Collaborative Learning	4	22%	30	68%	-46
	Technology-Enhanced Learning	1	6%	29	66%	-60

Note: Δ (pp) is calculated as China percentage minus Western percentage.

a. Teaching purposes

At the level of teaching purposes, the two datasets show a strong shared centre. The most consistent purpose in both datasets is Develop Analytical Skills, which appears in all Western syllabuses (44/44, 100%) and in a large majority of Chinese syllabuses (16/18, 89%). Several other purpose themes fall in broadly similar ranges across the two datasets, suggesting that

the overall purpose structure is comparable.

The only purpose theme with a difference larger than 20 percentage points is Effective Communication. It is stated in 34 of 44 Western syllabuses (77%) but in 10 of 18 Chinese syllabuses (56%), a difference of 21 percentage points. This gap is likely to reflect differences in how syllabuses phrase and foreground assessable aims. In the Western dataset, communication is often presented as an explicit course purpose and tied to concrete, assessable tasks. For example, the Michigan State University syllabus frames effective communication through students' ability to identify, analyse, and evaluate arguments in everyday discourse and media and to transfer these skills into their own thinking and writing. The University of Queensland syllabus similarly links clearer expression, persuasive argumentation, and academic writing to institutional graduate attribute language. In the Chinese dataset, communication-related elements are often visible as participation expectations rather than as named course purposes. The Huaqiao University syllabus, for instance, repeatedly requires students to participate actively in discussions and provide analyses of phenomena from campus learning and social life. Such statements clearly signal the importance of interaction and expression, but their textual function is closer to participation rules and learning requirements than to a separate, labelled course aim. The difference therefore appears to be one of explicit phrasing and documentation style rather than a straightforward indication that communication matters less in teaching.

b. Teaching content

In the content dimension, the two datasets again share a clear core. Foundations and Importance of Critical Thinking and Argument Analysis are highly visible in both contexts, and Fallacies is also frequently included. These results suggest that stand-alone critical thinking courses in both datasets commonly provide explicit introductory framing and then devote substantial attention to analysing and evaluating arguments and reasoning errors.

Two content themes show differences larger than 20 percentage points: Dialogue and Communication as Content appears in 25 of 44 Western syllabuses (57%) but in 4 of 18 Chinese syllabuses (22%), a difference of 35 percentage points. Academic Development

appears in 33 of 44 Western syllabuses (75%) but in 9 of 18 Chinese syllabuses (50%), a difference of 25 percentage points.

These gaps are best interpreted with attention to how syllabuses choose to name and structure content components. For Dialogue and Communication as Content, Western syllabuses more often present dialogue and communication as a named content component and describe it as part of reasoning practice. For example, Simon Fraser University frames classroom discussion as a space for testing reasons and responding to objections, and the University of the Sunshine Coast describes oral activities that require students to present, defend, and revise positions considering counter-arguments. In the Chinese dataset, discussion and seminar activity certainly appear, but they are less consistently framed as a named content strand. The Huaqiao University syllabus repeatedly requires students to participate actively in discussions and analyse relevant phenomena from campus learning and social life, and the Shaanxi Normal University syllabus is structured around discussion prompts linked to philosophical arguments. However, these elements are often presented as activity formats or participation requirements rather than as a content labelled ‘dialogue and communication’. This suggests that constructive dialogue is less often formalised as a clearly defined strand of course content, supported by explicit principles and corresponding classroom practice.

For Academic Development, Western syllabuses more consistently make academic reading and writing explicit as part of course content and link it to argument work. For example, The University of Adelaide frames essay tasks around evaluating claims against standards of evidence and inference, and Douglas College likewise ties academic performance to argument-driven writing tasks. In the Chinese dataset, academic development is clearly present when it is stated, for example in Dongguan University of Technology’s unit on ‘Academic Standards and Scholarship’ and in Hubei University’s ‘Clear Writing’ unit and instruction on argumentative essays. However, this kind of explicit labelling is not consistent across the Chinese syllabuses. The difference therefore might be a function of how reliably academic development is made visible in course documents, rather than whether this is an outcome of critical thinking teaching.

c. Teaching methods

The largest cross-dataset differences occur in the method dimension, and several method themes differ by more than twenty percentage points. Western syllabuses record teaching methods at high rates across the five method categories: Active Learning 75% (33/44), Oral Learning 73% (32/44), Collaborative Learning 68% (30/44), Written Learning 68% (30/44), and Technology-Enhanced Learning 66% (29/44). In the Chinese dataset, no method theme reaches the 'Standard' tier, and only Active Learning reaches 50% (9/18), while Oral Learning is 39% (7/18), Written Learning and Collaborative Learning are each 22% (4/18), and Technology-Enhanced Learning is 6% (1/18). These gaps should not be read as direct evidence that Chinese courses rely on fewer methods in practice. A more defensible reading is that the two sets of syllabuses differ in how fully they document teaching and learning activities.

Western syllabuses often include detailed sections on course delivery and activity types, making methods visible for coding. In the Western chapter, London Metropolitan University specifies taught classes, seminars, and debates; describes individual, pair, and group activities; and explains how the VLE supports materials, practice activities, feedback, and online discussion. Macquarie University similarly documents a combination of quizzes, reflective writing, peer review, and online engagement tasks. In the Chinese dataset, method reporting is often limited even when topic sequences are detailed (see, for example, the Renmin University of China and the University of Chinese Academy of Sciences). These patterns suggest that Chinese syllabuses tend to state aims and content more consistently than they describe method arrangements. This may be partly a matter of documentation, but it may also suggest that teaching methods receive less explicit attention as a dimension of course design than in Western universities.

The comparison of Western and Chinese critical thinking course syllabuses suggests that the two datasets share substantial similarities in core purposes and content, while also exhibiting differences in course positioning and in the textual presentation of teaching methods. Across both Chinese and Western contexts, the development of analytical skills, the introduction of foundational concepts of critical thinking, and a focus on argument analysis constitute

broadly shared core elements in course design. At the same time, Chinese courses in some cases place greater emphasis on formal logic as the principal means through which analytical and evaluative abilities are articulated. Chinese syllabuses also tend to prioritise the presentation of content structure and knowledge frameworks in syllabus texts, with more limited attention given to the description of teaching methods and learning activities. By contrast, Western courses more frequently include explicit references to dialogue, communication, and academic practice within both content and method statements, and provide more detailed accounts of how teaching and learning are organised. These differences should not be interpreted as direct indicators of teaching effectiveness. Rather, they might very well be related to differences in the purposes of course documentation and institutional arrangements across higher education contexts. The following discussion builds on these comparative observations to consider the possible sources of these differences and their implications for the design and positioning of critical thinking courses.

6.4 Discussion

6.4.1 Formal logic as a route to analytical development

The Chinese syllabus analysis indicates that analytical development is widely stated as a course purpose, and that in a subset of documents this aim is specified through an explicitly formal-logic route. Develop Analytical Skills appears in sixteen of eighteen syllabuses, and in five cases the purpose statements present analytical development primarily as logic-led argument competence. This pattern is also reflected in content structures where formal-logic standards and procedures are given substantial curricular space.

This logic-led pathway may support important aspects of critical thinking under certain instructional aims. Formal logic offers clearly defined rules of inference and explicit standards of validity, allowing arguments to be represented in structured forms and evaluated in a systematic manner. By translating reasoning into standardised representations and applying established logical principles, students can make inferential steps explicit and assess whether conclusions are properly supported by premises (Hatcher, 1999). For students with limited prior exposure to explicit reasoning standards, this rule-based approach may provide a stable entry point for learning how to articulate and regulate their own reasoning.

In this respect, formal logic can function as a practical scaffold for developing disciplined inference and structured argument construction, encouraging internal consistency and reducing reliance on intuitive or impressionistic judgement (Hatcher, 1999).

While formal logic provides powerful tools, an over-emphasis on this approach in critical thinking education may introduce limitations. An important risk of over-emphasising a formal-logic pathway is its weak alignment with real-world reasoning contexts. Much everyday reasoning takes place under conditions of uncertainty and non-formalised argumentation, where claims are often significantly context-dependent and imprecisely stated. If analytical ability is framed primarily in terms of formal validity, other central dimensions of argument evaluation may become less visible at syllabus level, including assessing the credibility and relevance of evidence, weighing competing considerations, and making context-sensitive judgements about relevance and sufficiency. As critics of formal logic have long noted, deductive validity is a stringent but narrow standard: an argument may be formally valid while remaining unpersuasive or practically unhelpful due to weak premises (Hatcher, 1999). When these broader evaluative dimensions receive limited attention, students may develop strong skills in rule-based inference while struggling to apply those skills to ill-structured, real-world arguments. This raises a concern about skill transfer, as logic-centred training without explicit bridging may encourage students to treat reasoning as a classroom-bound technical activity rather than as a general resource for everyday judgement and decision-making (Quintana & Schunn, 2019).

In Western critical thinking traditions, argument analysis is usually treated as a holistic practice: students are taught to examine an argument's logic and its content, checking the validity of its reasoning and the truth, relevance, and sufficiency of its premises, all within a given context (Ennis, 1996b; Facione, 1990). Skills like evaluating evidence, considering counterarguments, and understanding the influence of language and context are integral to these curricula (Ennis, 1996b; Facione, 1990). The question, therefore, is not whether formal logic belongs in critical thinking education but how to harness those strengths while avoiding the outlined limitations.

Researchers in China have also recognised this need for balance. Wu (2022), in a broader discussion of informal logic and critical thinking in China, notes that some Chinese textbooks in the past simply 'renamed' traditional logic courses as critical thinking courses without substantively introducing informal reasoning concepts. Wu argues that this revealed a poor grasp of the fundamental spirit of critical thinking and highlights the continuing challenge of how to relate logic, especially formal logic, to critical thinking more broadly. The documented prevalence of formal-logic may provide part of the foundation for critical thinking, but is far from sufficient on its own. Critical thinking is not reducible to formal logic.

Taken together, these patterns suggest that those Chinese critical thinking courses that rely heavily on a formal-logic route may benefit from drawing on well-established Western course designs that integrate formal and informal logic, while still adapting them to local aims and constraints. The present syllabus evidence, however, does not provide sufficient pedagogical detail to show how such integration is enacted in practice, particularly how formal-logic tools are combined with informal argument evaluation and context-sensitive judgement within a coherent learning sequence. For this reason, the next stage of the analysis turns to Western critical thinking textbooks, which provide more evidence of teaching content and the practical links made between validity-based reasoning and the evaluation of non-formal arguments. Building on these textbook findings, the final discussion chapter proposes potential recommendations for integrating formal-logic teaching with broader elements of critical thinking instruction in Chinese higher education.

6.4.2 Dispositions as content and the limits of syllabus-level detail

In the content dimension, Critical Thinking Dispositions as Content is not a dominant theme in any of the three evidence sources used so far in this thesis. It appears in 13 of 44 Western syllabuses (30%), 5 of 18 Chinese syllabuses (28%), and 23 of 64 studies (36%) in the scoping review. These figures suggest that disposition-related content is less consistently foregrounded than argument analysis and foundational framing, regardless of whether the source is course documentation or research literature. The main issue is therefore not a simple China-West difference, but a broader pattern in which dispositions are acknowledged

unevenly and are less often articulated as a clearly specified content component.

Several factors may help explain why dispositions are less visible as content across sources. One reason is that dispositions are often treated as an underpinning orientation rather than a teachable topic, and course documents may therefore assume them rather than naming them explicitly. A second reason is that dispositions can be difficult to operationalise at course level, especially if a syllabus is expected to specify assessable outcomes and concrete content units. There may also be a degree of curricular misalignment here, since dispositions, if included as content, often need to be introduced as an explicit object of instruction, including what these dispositions are and why they matter for critical thinking, rather than handled in the same way as skill-based content. In such contexts, teachers may prioritise content that can be more easily taught, practised, and assessed in explicit tasks, such as argument identification, reconstruction, and evaluation (Ennis, 1996b; Facione, 1990). A third reason is that dispositions are frequently positioned at broader curriculum levels, such as programme outcomes or institutional graduate attributes, meaning that individual courses may support disposition development without restating it as a content unit (Barrie, 2006).

Within the Chinese syllabus dataset, the low frequency of Critical Thinking Dispositions as Content indicates that they are rarely presented as a named content strand. Where disposition-related aims are present, they are more often stated at the level of course purposes and are typically expressed in general terms rather than as clearly specified dispositions. This under-specification at syllabus level does not necessarily imply that dispositions are absent from teaching. It suggests, rather, that disposition development may be treated as an expected by-product of knowledge and skill teaching, or as a broad educational aspiration, instead of being framed as content that is introduced, developed, and revisited through explicit teaching content. From a curriculum design perspective, this matters because dispositions are difficult to cultivate reliably without clear instructional attention (Ennis, 1996b). If dispositions are valued, but not made explicit in content or task design, there is a risk that they remain rhetorical aims that are weakly connected to learning activities and assessment.

The syllabus evidence also suggests a further practical issue for disposition development in

the Chinese context. If ‘analytical development’ is strongly framed through formal-logic pathways in a subset of courses, disposition-related elements may become even less visible, because the course is presented primarily through a rule-based content sequence. In such cases, the explicit curriculum may encourage a view of critical thinking as technical correctness, such that dispositions such as open-mindedness or intellectual humility become far less relevant. In other words, if context-dependent judgement and decision making is ignored or diminished, then so are the various dispositions that help enable these processes.

For these reasons, further evidence is needed to understand how disposition development is handled in practice and how it can be incorporated into coherent course design. The next stages of the thesis therefore examine Western critical thinking textbooks and Western teacher survey data. Textbooks have the potential to offer more detailed evidence of how dispositions are integrated with critical thinking skills. Teacher survey data provide complementary insight into teaching priorities and assessment choices, including whether dispositions are treated as teachable and assessable elements or as implicit expectations. Together, these sources can clarify how disposition development is supported in practice and provide a basis for proposing more workable recommendations for integrating dispositions into critical thinking teaching in Chinese higher education.

6.5 Chapter summary

This chapter presents a thematic analysis of 18 critical thinking course syllabuses from Chinese universities and compares the findings with the Western syllabus dataset analysed in the previous chapter. Using an abductive coding framework, it examines three dimensions of course design: teaching purposes, teaching content, and teaching methods. In this way, the chapter explores how critical thinking is formally incorporated into curricula in the Chinese higher education context.

The coding results indicate that, in the purpose dimension, Develop Analytical Skills is close to universal (89%). Better Decision Making (61%), Enhanced Learning (56%), Develop Critical Thinking Dispositions (56%), and Effective Communication (56%) also appear in more than half of the syllabuses. In the content dimension, the strongest agreement is found:

Foundations and Importance of Critical Thinking (94%) and Argument Analysis (89%) are standard components, and Fallacies (72%) is also widely included. By contrast, methods are documented less consistently. No method theme reaches the standard band; only Active Learning appears in half of the syllabuses (50%), while Oral Learning, Written Learning, Collaborative Learning, and Technology-Enhanced Learning are reported less often. This distribution suggests that Chinese syllabuses tend to state purposes and content more systematically than they describe learning activities and instructional organisation. For this reason, low method frequencies should be interpreted cautiously.

Overall, the comparison suggests a substantial shared core between Chinese and Western contexts in both purposes and content. Across the two datasets, Develop Analytical Skills and Argument Analysis function as central elements of course design and remain highly visible in course documents. At the same time, a notable feature of the Chinese dataset is that, in some courses, analytical development is framed primarily through a formal-logic pathway. Five syllabuses define analytical skills mainly in terms of formal logical reasoning and argument competence. In these cases, critical thinking is presented through symbolic tools and rule-based procedures, including validity testing, truth tables, syllogistic reasoning, and other structured techniques. This chapter does not take such evidence to mean that informal reasoning is absent from teaching practice. However, it does show that, in the documents analysed, formal logic is often the most explicitly stated and structurally central route for presenting critical thinking. By contrast, Western critical thinking syllabuses are more closely aligned with a conception of argument evaluation that addresses the context-dependency of claims, the quality of evidence, and the weighing of competing considerations, whereas a substantial subset of Chinese syllabuses organises content around rule-governed procedures.

The analysis also suggests that dispositions are not strongly foregrounded as content in Chinese syllabuses. Where dispositions are mentioned, they are often expressed in broad terms rather than as clearly specified dispositions that are identified, explained, and treated as distinct elements of course content. This pattern is consistent with the Western syllabus dataset and the evidence from the scoping review, indicating that uneven treatment of

dispositions as content is not simply a China-West difference. In general, syllabus-level evidence implies that dispositions are more often presented as general course aims than as teachable content strands with dedicated curricular space.

Clear differences are also evident in the way teaching methods are documented. Chinese syllabuses provide fewer and less specific statements about instructional design. When methods are mentioned, they are often presented as participation expectations, such as active participation in discussion, rather than as descriptions of concrete pedagogical strategies, lesson structure, or feedback processes.

These results provide important context for the remainder of the thesis. Since syllabuses offer only partial and potentially idealised accounts of teaching content and methods, the next chapters turn to Western critical thinking textbooks and teacher survey data to examine how stated purposes are translated into classroom activities.

Chapter Seven: Thematic analysis of critical thinking textbooks

7.1 Introduction

Chapters Five and Six examined how critical thinking is represented in course syllabuses from Western and Chinese universities. However, these syllabuses often remain at the level of briefly listing teaching purposes, content and methods, lacking detailed explanations. To address this gap, this chapter shifts its focus from course syllabuses to textbooks. Compared with syllabuses, textbooks provide more detailed information on teaching purposes, content and sometimes methods.

This chapter has four research objectives. The first objective is to provide a more detailed account of critical thinking instruction than is available in course syllabuses. The second objective is to examine the theoretical foundations that inform the selection of teaching content and, where textbooks provide such material, how these principles are reflected in exercises and other teaching features. The third objective is to identify forms of critical thinking content that are present in textbooks but not explicitly stated in course syllabuses. The final aim is to triangulate the textbook findings with the syllabus analyses, thereby strengthening the evidence base for later assessing how selected course elements may inform critical thinking course development in Chinese higher education.

A total of 22 textbooks were included in the analysis. These textbooks are listed in Table 7-1. They were defined as books identified in their titles as critical thinking educational resources, or as books whose introductions or prefaces make clear that they are primarily concerned with critical thinking in the sense established earlier in this thesis. The full inclusion criteria are provided in Chapter Two.

The resulting dataset consists of Western critical thinking textbooks published in English. Chinese-language textbooks are not included. Critical thinking has developed relatively recently as a distinct university subject in China, and the field has been influenced in part by

Chinese translations of prominent English-language textbooks (Dong, 2015; Wu, 2022). Potentially relevant publications include translations, locally adapted textbooks, and textbooks originally written by Chinese scholars. Relevant material also appears in textbooks used in courses on formal logic, informal logic, argumentation, philosophy, and general education. Wu (2022), for example, notes that some earlier publications presented as critical thinking textbooks retained much of the content of traditional logic courses. Critical thinking education in China therefore does not correspond neatly to a clearly identifiable set of textbooks explicitly presented as critical thinking textbooks. Determining what should count as a comparable critical thinking textbook in the Chinese context would require separate, context-sensitive criteria for selecting and classifying publications. It would also require attention to the linguistic and cultural contexts in which concepts such as 'critique', 'criticality', and 'critical thinking' are translated and understood (Chen, 2017; Xie et al., 2025). Establishing and analysing such a dataset would constitute a substantial comparative study in its own right and was beyond the scope of the present thesis.

Although Chinese textbooks could have provided further evidence about critical thinking teaching in China, the principal comparison between the two contexts is based on the two scoping reviews and the Western and Chinese syllabus datasets. The Western textbook analysis serves a different purpose within this design: it develops the Western evidence in greater pedagogical detail and supports the later synthesis of teaching purposes, content, and methods into a workable and context-sensitive course framework for Chinese higher education. The Chinese evidence drawn from the scoping review, syllabus dataset, and policy analysis, in turn, is used to assess how the course elements identified in the Western evidence relate to the Chinese context, including where adaptation may be required or constraints may arise. Given these different roles and the methodological difficulties outlined above, the textbook findings are used to inform the later course framework rather than to make direct comparisons between Western and Chinese textbooks.

The chapter first presents the themes generated through the coding, then reports the coding frequencies, and finally explains newly identified themes and discusses their significance for the wider analysis.

Table 7-1 List of Western critical thinking textbooks

Authors	Year	Title	Publisher	Edition
Bassham, Gregory; Irwin, William; Nardone, Henry and Wallace, James M.	2011	*Critical Thinking: A Student's Introduction*	McGraw-Hill Education	4th ed., illustrated
Browne, M. Neil, and Keeley, Stuart M	2014	*Asking the Right Questions: A Guide to Critical Thinking*	Pearson	11th ed.
Chatfield, Tom	2017	*Critical Thinking: Your Guide to Effective Argument, Successful Analysis and Independent Study*	SAGE Publications Ltd	1st ed.
Cottrell, Stella	2011	*Critical Thinking Skills: Developing Effective Analysis and Argument*	Palgrave Macmillan	2nd ed.
Ennis, Robert H	1996	*Critical Thinking*	Prentice Hall	illustrated ed.
Epstein, Richard L.	2018	*The Fundamentals of Argument Analysis*	Advanced Reasoning Forum	eBook ed.
Fisher, Alec	2011	*Critical Thinking: An Introduction*	Cambridge University Press	2nd ed.
Fogelin, Robert, and Sinnott-Armstrong, Walter	2005	*Understanding Arguments: An Introduction to Informal Logic*	Thomson/Wadsworth	1st ed.
Govier, Trudy	2010	*A Practical Study of Argument*	Cengage Learning	7th ed.
Halpern, Diane F	2013	*Thought and Knowledge: An Introduction to Critical Thinking*	Psychology Press	5th ed.
Hanscomb, Stuart	2023	*Critical Thinking: The Basics*	Routledge	2nd ed.

Hughes, William; Lavery, Jonathan and Doran, Katheryn	2014	*Critical Thinking: An Introduction to the Basic Skills*	Broadview Press	7th ed.
Johnson, Ralph H., and Blair, J. Anthony	2006	*Logical Self-Defense*	IDEBATE Press / Idea	New U.S. ed.
Bowell, Tracy and Kemp, Gary	2014	*Critical Thinking: A Concise Guide*	Routledge	4th ed.
LeBlanc, Jill	1998	*Thinking Clearly: A Guide to Critical Reasoning*	W. W. Norton & Co.	Illustrated ed.
Lunsford, Andrea A., and John J. Ruszkiewicz.	2010	*Everything's an Argument with Readings*	Bedford/St. Martin's	5th ed.
Lyons, Jack, and Barry Ward	2017	*The New Critical Thinking: An Empirically Informed Introduction*	Routledge	1st ed.
Morrow, David R., and Anthony Weston	2019	*A Workbook for Arguments: A Complete Course in Critical Thinking*	Hackett Publishing Company	3rd ed.
Sinnott-Armstrong, Walter	2018	*Think Again: How to Reason and Argue*	Penguin Books Ltd (Pelican)	1st pelican ed.
Talbot, Marianne	2015	*Critical Reasoning: A Romp through the Foothills of Logic for the Complete Beginner*	CreateSpace Independent Publishing Platform	1st ed.
Thomson, Anne	2009	*Critical Reasoning: A Practical Introduction*	Routledge	3rd ed., revised
Walton, Douglas	2006	*Fundamentals of Critical Argumentation*	Cambridge Universit y Press	1st ed., illustrated

7.2 Coding and analysis

This chapter utilised the abductive method to analyse the selected textbooks (details of the abductive method can be found in Chapter Two). Based on this method, the coding is divided into two parts. First, the scoping review in Chapter Three generated the initial themes for teaching purposes, content, and methods. In analysing the textbooks, I used the theme definitions presented in Sections 3.2.3.1-3.2.3.3 as coding criteria for assigning relevant textbook extracts to those themes. This provided a structured method for categorising and comparing data, grounding the study in existing theory for consistent analysis and identification of standard teaching elements. Second, the analysis remained open to themes that were not captured by the predefined framework. In this way, the abductive method ensured both an examination grounded in existing research and the flexibility to explore new insights. To ensure the reproducibility and transparency of the coding work, the coding process for the twenty-two books is documented in the Appendix F. The appendix lists in detail the Raw Data (original text from the book), Coding, and themes extracted from each book, and specifies the chapters from which the raw data were derived.

7.3 Findings

Table 7-2 presents the coding results across the 22 critical thinking textbooks. The discussion below reports the predefined themes alongside any additional themes that emerged from the textbook material.

Table 7-2 Coding results of critical thinking textbooks (n = 22)

(A) Themes derived from the scoping review framework

Dimension	Theme	Number of Textbooks	Percentage (%)
Purpose	Develop Analytical Skills	22	100%
	Develop Critical Thinking Dispositions	22	100%
	Better Decision Making	18	82%
	Effective Communication	18	82%
	Enhanced Learning	16	73%

	Civic Engagement	2	9%
	Develop Creativity	1	5%
Content	Foundations and Importance of Critical Thinking	22	100%
	Defining Arguments	22	100%
	Identifying Arguments	22	100%
	Reconstructing Arguments	22	100%
	Categorising Arguments	22	100%
	Evaluating Arguments	22	100%
	Fallacies	22	100%
	Critical Thinking Dispositions as Content	22	100%
	Dialogue and Communication as Content	5	23%
	Academic Development	4	18%
	Problem Solving	4	18%
Method	Active Learning	22	100%
	Written Learning	8	36%
	Oral Learning	6	27%
	Collaborative Learning	6	27%
	Technology-Enhanced Learning	3	14%

(B) New themes emerging from textbook analysis

Dimension	**Theme**	**Number of Textbooks**	**Percentage (%)**
Content	Language and Definition	22	100%
	The Role of Emotions	7	32%
	Probability	7	32%
	Cognitive Biases and Heuristics	5	23%
	Scientific Knowledge	4	18%

	The Role of Memory	1	5%
	Value Judgements	1	5%

Consistent with the tiering approach established in the earlier syllabus analyses, the coding results in this chapter are also organised using frequency-based categories. Themes are grouped into four tiers: 'Standard' for elements present in 80-100% of the textbooks; 'Frequent' for elements occurring in 50-80% of the textbooks; 'Non-standard' for elements found in 20-50% of the textbooks; and 'Uncommon' for elements appearing in 0-20% of the textbooks. As in the earlier analyses, frequency thresholds are treated as indicative rather than absolute. Given the size and characteristics of the textbook dataset, themes positioned close to category boundaries are interpreted with caution, recognising that small differences in frequency may not correspond to substantive differences in curricular emphasis.

Clearly enough the nature textbooks are such that coding can capture most content themes more fully than syllabus coding. It can also reveal more detailed internal structure within the broad categories used in the earlier analyses.

In the purpose dimension, several themes reach the Standard tier. Develop Analytical Skills and Develop Critical Thinking Dispositions appear in all textbooks, and Better Decision Making and Effective Communication also exceed the 80% threshold. This pattern is broadly consistent with the earlier analyses, where analytical development and practical applications were also prominent aims. Enhanced Learning falls within the Frequent tier (73%). Although it does not meet the formal Standard criterion in this dataset, it lies relatively close to the 80% boundary. In Chapter Three, Enhanced Learning fell into a higher frequency tier. Read alongside that pattern, the present result is best treated as a boundary case: Enhanced Learning appears to be a widely endorsed purpose, but it is less consistently made explicit in textbooks than in the research literature. In other words, the difference is likely to reflect variation in how purposes are articulated across source types, rather than a substantive divergence in what critical thinking is ultimately claimed to achieve.

In contrast, Develop Creativity and Civic Engagement fall within the Uncommon tier in the

textbook dataset. This is broadly consistent with the scoping review and syllabus datasets, where both themes also appear only in a minority of sources, although they seem to be less strongly represented in the textbook sample. One plausible explanation is that textbooks often refer to creativity or civic life at the level of general justification rather than as explicit instructional aims. For example, a textbook may state that critical thinking helps people become more innovative, independent, or responsible participants in society, without presenting creativity or civic engagement as clearly defined topics to be systematically taught and assessed. Under a coding approach that relies on explicit purpose statements, this difference in how purposes are articulated can affect what is visible in the results.

In the content dimension, Foundations and Importance of Critical Thinking is present in all textbooks. The argument-related content is also Standard, and it aligns with the earlier scoping review and syllabus analyses, where this area was captured under the broader theme Argument Analysis. The difference in the textbook dataset is mainly one of detail. Instead of presenting Argument Analysis as a single topic, textbooks typically specify it through a sequence of components, coded here as Defining Arguments, Identifying Arguments, Reconstructing Arguments, Categorising Arguments, and Evaluating Arguments. This indicates consistency in emphasis across datasets, while showing that textbooks present the same content in a more step-by-step instructional format.

In addition, Fallacies and Critical Thinking Dispositions as Content are Standard across all 22 textbooks. In the earlier analyses, these themes were not placed at the same level of prominence, which may reflect how syllabuses and research descriptions often summarise content in broader headings and may not list these areas separately. The textbook results therefore provide more explicit evidence that Fallacies and Critical Thinking Dispositions as Content are routinely treated as teachable content within textbook-based presentations of critical thinking. Beyond this shared core, Dialogue and Communication as Content falls within the Non-standard tier. Academic Development and Problem Solving fall below 20% and therefore sit in the Uncommon tier by the formal thresholds. However, both lie close to the 20% boundary, so their positioning should be interpreted cautiously, particularly when comparing across datasets where these themes appear more frequently.

In the method dimension, Active Learning is Standard across all textbooks, which is consistent with the earlier analyses and reflects the fact that all 22 textbooks include exercises or other applied tasks as part of their presentation. The remaining method themes do not reach the Frequent tier. Written Learning, Oral Learning, and Collaborative Learning fall within the Non-standard range, indicating that textbooks vary in whether they describe these approaches explicitly. A plausible explanation is that textbooks are not course plans and therefore do not always specify how activities should be implemented in classrooms. Authors may provide prompts, questions, and exercises, but leave it to teachers to decide whether these are completed individually or in groups, in writing or through discussion. This flexibility can lead to lower and more uneven reporting of these method themes. Perhaps for similar reasons, Technology-Enhanced Learning is Uncommon.

Overall, the comparison indicates continuity across textbooks, syllabuses, and the scoping review in the central orientation of critical thinking teaching, particularly around Develop Analytical Skills, Argument Analysis, and Active Learning. The definitions and coding rules for the purpose, content, and method themes reported above follow those established in the earlier scoping review chapter. For this reason, the detailed meanings of these themes are not repeated here; readers are referred to the scoping review chapter for the full theme definitions and extraction rules.

At the same time, the textbook analysis identified several new themes that were not captured in the review-derived framework. All these new themes fall within the teaching content dimension, rather than the purpose or method dimensions. Their distribution across the 22 textbooks is reported in Table 7-2(B). One theme, Language and Definition, appears across all textbooks. Several themes appear in a minority of textbooks, including: The Role of Emotions (7/22) and Probability (7/22), followed by Cognitive Biases and Heuristics (5/22) and Scientific Knowledge (4/22). Two themes, The Role of Memory and Value Judgements, appear only in one textbook.

Table 7-3 introduces each of these new themes in turn and illustrates how they are presented in the textbooks. The Discussion section then discusses these themes in more detail and

examines their potential role within textbook-based representations of critical thinking.

Table 7-3 Definitions and illustrative examples of new themes identified

Theme	Examples (Original Text)	Source
Language and Definition: This theme describes the relationship between language and argument, including the impact of language on argument, the problems posed by language vagueness and ambiguity. It also describes how ambiguity can be resolved through definitions.	*The thinking process can also be misled when words are imprecise or misused. Words are ambiguous when they can have multiple meanings depending on context, and the appropriate meaning is unclear in a given context. Although ambiguous words have multiple meanings, vague words have imprecise meanings. Vagueness refers to a lack of precision in a communication. Consider the 'clarification' provided by Justice Brennan of the U.S. Supreme Court when he provided a working definition that would assist those in the legal process of determining the sort of punishment that is cruel and unusual.*	Halpern, *Thought and Knowledge: An Introduction to Critical Thinking*, Chapter Three
The Role of Emotions: This category refers to introducing the definition of emotions in psychology, their roles, and both the positive and negative impacts of emotions on thinking and dialogues.	*Emotions have a heuristic function that can direct us to features of situations that might otherwise be overlooked*	Hanscomb, *Critical Thinking: The basics*, Chapter Two
Probability: This category refers to introducing the concept and role of probability, along with various types of	*The conditional probability of a proposition relative to a set of a premises is the degree to which it would be rational to expect it to be true, given the information relevant to the conclusion given in the premises.*	Bowell and Kemp, *Critical Thinking: a concise guide*, Chapter Four

probabilities such as classical probability, conditional probability, and Bayesian probability.		
Cognitive Biases and Heuristics: This theme refers to the combination of critical thinking with the theories of cognitive biases and heuristics in psychology. It involves introducing the definitions, types, and impacts of cognitive biases and heuristics on thinking.	*In particular, it's important to be alert to the problem of confirmation bias: the universal human tendency to use new information only to confirm what you already believe, rather than seeking to improve and clarify your understanding.*	Chatfield *Critical Thinking*, Chapter Nine
Scientific Knowledge: This theme refers to students' understanding of how scientific or data-based information is produced, represented, and used to support claims, including how to interpret tables and graphs, assess relationships between variables, and recognise the limits of evidence.	*Key features of tables and graphs are their titles and the labeling of their horizontal and vertical axes. Then one must also determine whether the numbers or lines mean what they might at first seem to mean. One way to do this is to see what bearing a conclusion drawn from data might have on you. For example, does the highway fatality table tell you that you would be at greater risk in Texas than in other places considered?*	Ennis, *Critical Thinking,* Chapter Ten
Value Judgements: This theme explains the concept of Value Judgements, the distinction between Value	*A statement of the worth (positive or negative) of some thing or action is a Value Judgements. Value Judgements differ from factual statements.*	Ennis, *Critical Thinking*, Chapter Eleven

Judgements and factual statements, and the role of Value Judgements.		
The Role of Memory: This theme describes the definition of memory, its importance, and how to improve memory skills.	*Review each skill and be sure that you understand how and when to use each one: monitoring attention, making information meaningful, using advanced organizers, organizing information, overlearning, recognizing fallibility of memory, generating retrieval cues, practicing recall, monitoring learning, using external and internal memory aids, applying cognitive interview techniques, developing awareness of biases.*	Halpern, *Thought and Knowledge: an introduction to critical thinking*, Chapter Two

7.4 Discussion

7.4.1 Comparing textbooks and Western critical thinking syllabuses under a shared coding framework

Table 7-4 provides a comparison between the Western critical thinking syllabus dataset (n = 44) and the textbook dataset (n = 22) using the shared coding framework. By presenting frequencies and reporting the percentage-point differences, the table helps to identify (1) themes that remain stable across both materials and (2) themes whose visibility changes when the same framework is applied to different forms of teaching material. For comparative purposes, the five textbook subthemes of argument analysis (defining, identifying, reconstructing, categorising, and evaluating arguments) are re-aggregated here under the broader shared theme of Argument Analysis used in the syllabus analysis.

Table 7-4 Comparative coding results for textbooks and Western critical thinking syllabuses

Dimension	Theme	Western Syllabuses (n = 44)	Western %	Textbooks (n = 22)	Textbooks %	Difference
Purpose	Develop Analytical Skills	44	100%	22	100%	0
	Enhanced Learning	26	59%	16	73%	14
	Better Decision Making	25	57%	18	82%	25
	Develop Critical Thinking Dispositions	26	59%	22	100%	41
	Civic Engagement	15	34%	2	9%	−25

	Develop Creativity	12	27%	1	5%	−22
	Effective Communication	34	77%	18	82%	5
Content	Argument Analysis	38	86%	22	100%	14
	Critical Thinking Dispositions as Content	13	30%	22	100%	70
	Problem Solving	19	43%	4	18%	−25
	Fallacies	31	70%	22	100%	30
	Dialogue and Communication as Content	25	57%	5	23%	−34
	Foundations and Importance of Critical Thinking	36	82%	22	100%	18
	Academic Development	33	75%	4	18%	−57
Method	Active Learning	33	75%	22	100%	25
	Oral Learning	32	73%	6	27%	−46
	Written	30	68%	8	36%	−32

	Learning					
	Collaborative Learning	30	68%	6	27%	−41
	Technology-Enhanced Learning	29	66%	3	14%	−52

All 22 textbooks include Foundations and Importance of Critical Thinking and a shared cluster of argument-focused content: Defining Arguments, Identifying Arguments, Reconstructing Arguments, Categorising Arguments, Evaluating Arguments. This pattern is consistent with the syllabus and scoping-review results, where Argument Analysis and Develop Analytical Skills also occupy a central position. The textbook evidence supports the view that argument analysis is treated as a core route through which critical thinking is taught and practised, rather than as an optional topic.

In the textbook analysis, what earlier chapters coded more broadly as Argument Analysis is presented in a more explicit sequence of instructional steps. Defining Arguments refers to teaching what counts as an argument and how arguments differ from related forms of discourse such as statements, explanations and descriptions. This step typically clarifies the basic structure of arguments, including the nature of and relationship between premises and conclusions. Identifying Arguments concerns recognising arguments in natural language contexts, including locating conclusions and premises even when they are not signposted. Reconstructing arguments involves making an argument clearer and more assessable, for example by paraphrasing, adding implied premises where justified, and presenting the reasoning in a standard form. Categorising arguments refers to classifying arguments by type or structure, such as distinguishing deductive from inductive reasoning or separating causal, analogical, and generalisation-based arguments, so that appropriate evaluative standards can later be applied. Evaluating arguments focuses on assessing the quality of reasoning, including whether premises are acceptable, and whether they are relevant to, and sufficient for establishing the conclusion. Read together, these components form a staged pathway: students first learn what an argument is, then learn to locate and clarify arguments, then learn

to classify them, and finally learn to assess them.

This staged approach is broadly compatible with several well-known expert frameworks. The Delphi Report identifies core critical thinking skills such as interpretation, analysis, evaluation, and inference, which correspond closely to textbook emphasis on identifying, reconstructing, and evaluating arguments (Facione, 1990). Ennis's FRISCO model (Focus, Reason, Inference, Situation, Clarity, and Overview) (Ennis, 1996a, pp.4-8) also aligns with the textbook sequence. In FRISCO, Focus refers to stating the issue or question and clarifying the main conclusion under consideration. This supports argument identification by fixing what claim the reasoning is aiming to establish. Reasons refers to identifying the reasons offered in support of that claim, which again supports identifying arguments by locating premises. Inference refers to checking how the reasons are meant to lead to the conclusion and whether the step from reasons to conclusion is warranted, and this connects directly to evaluation, especially the strength of the inferential link. Situation refers to attending to the context, including background assumptions, constraints, and the relevant information conditions; this supports reconstruction by making implicit assumptions explicit where needed and supports evaluation by checking whether context changes what counts as relevant or sufficient support. Clarity refers to ensuring that key terms and claims are expressed precisely and unambiguously. This links directly to textbook treatment of language and definition, and it also supports reconstruction and evaluation by reducing ambiguity and improving the formulation of arguments. Overview refers to stepping back to review the whole argument, checking consistency, missing premises, alternative interpretations, and overall strength; this aligns with the final stage of evaluation and with reflective checking after reconstruction.

The centrality of argument analysis in teaching critical thinking is also supported by pedagogical research. For example, authors such as Facione (2011), Nold (2017), Paul and Elder (1992), and Thomas and Lok (2015) argue that explicit instruction and practice in analysing and evaluating reasons and conclusions are important for developing critical thinking. On this view, argument analysis is not simply a content area to be covered, it also provides a practical route through which broader critical thinking outcomes can be

developed. It teaches students to read and listen carefully, express their views with greater precision, consider competing positions more fairly, and evaluate claims with a stronger commitment to truth.

The difference in their function helps to explain why some themes appear much more consistently in textbooks than in syllabuses. For example, Fallacies rises from 70% in syllabuses to 100% in textbooks (+30), and Critical Thinking Dispositions as Content rises from 30% to 100% (+70). One possible explanation is that textbooks are designed to provide broad conceptual coverage, whereas syllabuses must make selective decisions about what can realistically be prioritised within a course. Themes such as fallacies and dispositions can therefore be presented relatively easily in textbooks as important areas of knowledge, even if they are not equally emphasised in course design. In classroom practice, however, teachers may prioritise the skills they feel most confident teaching and assessing, especially argument analysis. Dispositions, by contrast, are harder to operationalise and assess transparently, and may therefore be more readily acknowledged in textbooks than consistently foregrounded in stand-alone course documents.

A similar contrast is visible in the purpose dimension, where the largest negative gap concerns Civic Engagement. It appears in 34% of syllabuses but in 9% of textbooks (−25). One potential interpretation is that syllabuses often state course purposes at a macro level in order to justify the course's place within a broader curriculum, especially where institutions expect courses of this kind to contribute to aims such as informed citizenship, social responsibility, or participation in public life. Textbooks, however, often present critical thinking through relatively stable cognitive skills that are transferable across topics. Applying critical thinking to civic engagement typically requires sustained use of current affairs and contested public issues. Such material can quickly become dated, and it can introduce sensitivities that textbook authors may prefer to avoid.

In the content dimension, the table also shows that themes linked to academic study skills are much more common in syllabuses than in textbooks. Academic Development drops from 75% in syllabuses to 18% in textbooks (−57). One possible explanation is that syllabuses

often need to justify a course's place within the wider curriculum by showing its practical value for students. Framing critical thinking in relation to essay writing, academic reading, source use, or literature review helps present the course as directly supportive of broader university study. This emphasis may also be reinforced by the fact that syllabuses usually specify assignments and performance expectations. Textbooks, by contrast, do not usually need to make the same curricular case. They are more likely to present critical thinking as a relatively self-contained set of transferable reasoning skills, and therefore to concentrate on argument analysis and related forms of reasoning. What is distinctive here is the claim that these skills are foundational and transferable across disciplines: by learning to identify, reconstruct, categorise, and evaluate arguments, students are expected to strengthen forms of academic reading, writing, and judgement that can be used beyond a single course context. This is consistent with the textbook pattern in which argument-related content is present throughout, and is presented in a highly structured way through Defining Arguments, Identifying Arguments, Reconstructing Arguments, Categorising Arguments, and Evaluating Arguments (each at 100%).

The method results show a further contrast between what textbooks can embed and what syllabuses typically specify. Textbooks record Active Learning in 100% of cases, compared with 75% in syllabuses (+25). By contrast, methods that depend on delivery arrangements are much less often stated in textbooks than in syllabuses, including Oral Learning (73% to 27%, −46), Collaborative Learning (68% to 27%, −41), and Technology-Enhanced Learning (66% to 14%, −52). This pattern reflects the fact that textbooks readily incorporate exercises and prompts, whereas syllabuses are more likely to specify the interactional and organisational formats through which teaching is delivered.

7.4.2 New themes

The textbook analysis also identified several new themes that are often implicit or overlooked in syllabus documentation. These include Language and Definition, Psychological Influences, Scientific Knowledge, and Value Judgements. In this chapter, Psychological Influences is used as a broader category that brings together The Role of Memory, Cognitive Biases and Heuristics, and The Role of Emotions. Probability was also

identified as a new theme. However, because the textbooks show some differences in how probability is understood and positioned within critical thinking instruction, it is discussed separately in Section 7.4.3 Conceptual differences among textbooks. The following sections examine how these themes are represented in textbooks and consider how they may extend or reshape what is treated as critical thinking content.

7.4.2.1 Language and Definition

Arguments and language are inseparable because the words we choose shape how our reasoning is understood. If our language is unclear or misleading, what has the potential to be a sound argument can fail to communicate its point. Paul and Elder emphasise that clarity is the 'gateway' standard for critical thinking: to be clear is to be 'free from confusion or ambiguity,' which is a prerequisite to evaluating truth or logic (Paul & Elder, 1992, pp.11-12). Thus, language directly impacts reasoning, unclear language invites confusion and hinders critical evaluation.

Definitions are one of the most important tools for handling ambiguity and vagueness. In critical thinking, to define a term means to state clearly what we mean by it, thereby setting boundaries on its interpretation. A good definition can sharpen a fuzzy concept or pinpoint one meaning out of many, thus ensuring everyone is 'on the same page' before evaluating an argument (Hughes et al., 2014, pp. 35-37). Definitions help to achieve consensus, thus avoiding arguments over terminology.

Given this significance, we can see why language and definitions are included in all 22 critical thinking textbooks. My review uncovers a familiar pattern: after introducing what arguments are, they often include a dedicated chapter on language and definition - covering meaning, ambiguity, definition, etc. For example, *Thinking Clearly* by Jill LeBlanc features Chapter 5, 'Language,' which includes the following sections:

- *Definitions*
- *Stipulative Definitions*
- *Evaluating Stipulative Definitions*
- *Operational Definitions*

- *Fallacies of Language*
- *Persuasive Definitions*
- *Emotional Force in Language*
- *Ambiguity and Vagueness*

Likewise, *Critical Thinking: An Introduction to the Basic Skills* by William Hughes et al. (2014) offers an early chapter titled ‘Meaning and Definition’:

Chapter 2: Meaning and Definition

2.1 The Complexity of Language

2.2 The Meaning of Language

2.2.1 The Reference Theory of Meaning

2.2.2 The Idea Theory of Meaning

2.2.3 Meaning as Use

2.3 The Main Functions of Language

This consistency across textbooks reflects a consensus: authors agree that accuracy and precision in the use of language are foundational to critical thinking. Without it, students would struggle to analyse arguments or spot errors in reasoning that stem from linguistic confusion. As Hughes et al. (2014, p. 41) state, the structure of critical thinking always includes attention to language and definition among the core topics. It can also be inferred that the precision required for argument analysis may support communication skills, since clear and unambiguous language makes it easier for others to understand, assess, and respond to a person’s reasoning in constructive evaluative discussion.

7.4.2.2 Psychological Influences

The traditional definition of critical thinking emphasises analysing information and arguments in a reasonable and objective way. However, everyday reasoning is not exercised in pure logic, but is influenced by underlying cognitive factors such as memory, cognitive biases and heuristics, and emotional states. Research in psychology and neuroscience illustrates how psychology influences our reasoning and decision-making (Dwyer, 2023; Tyng et al., 2017). By integrating psychological insights, critical thinking instruction can

thus help students try to avoid the negative influence of heuristics and emotions and use this understanding to improve, among other things, self-knowledge, and their ability to identify fallacies and engage in constructive dialogues. Among the twenty-two critical thinking textbooks examined, nine specifically integrate content related to psychology (Tom Chatfield, Stella Cottrell, Diane F. Halpern, Stuart Hanscomb, Ralph H. Johnson and J. Anthony Blair, Jill LeBlanc, Andrea A. Lunsford and John J. Ruszkiewicz, Jack Lyons and Barry Ward, Douglas Walton). The psychological content of the discussion includes the following three aspects.

a. The Role of Memory
b. Cognitive Biases and Heuristics
c. Role of Emotions in Critical Thinking

a. The Role of Memory

According to Halpern (2013, p. 61), memory plays a fundamental role in critical thinking: we rely on working memory to hold and organise information while analysing it, and we draw on long-term memory for background knowledge and past experiences relevant to the problem at hand. Cognitive scientists have shown that working memory capacity correlates closely with reasoning and critical thinking ability. For example, Li et al. (2024) conducted a two-wave longitudinal cross-lagged study with 509 adolescents, measuring working memory, thinking dispositions, and critical thinking ability at two time points one year apart. They found that working memory at Time 1 significantly predicted critical thinking ability at Time 2, suggesting that working memory may be an important factor in later critical thinking performance. If working memory is overwhelmed (e.g. by too much information at once), critical thinking suffers because we simply cannot juggle all the necessary ideas (Tyng et al., 2017). Long-term memory is equally crucial; as Willingham (2019) notes, extensive domain knowledge stored in memory is a ‘crucial driver’ of thinking skills, enabling students to recognise patterns and apply thinking strategies effectively.

Despite its importance, human memory is not a neutral store of past experience. Research in cognitive psychology shows that memory is reconstructive and therefore prone to distortion (Laney & Loftus, 2013). One common problem is that remembered events are often

reorganised into a more coherent narrative than the original experience warranted. This can make past events seem simpler, more orderly, and more predictable than they actually were, a tendency closely related to hindsight bias (Kahneman, 2011, p. 204). In the context of critical thinking, such reconstruction matters because students may base their judgement on recollections that feel accurate but are in fact selective or oversimplified. For instance, if students remember data, readings, or earlier stages of an argument in a distorted way, their subsequent analysis may be flawed. Halpern (2013, p. 65) similarly notes that inadequacies in basic cognitive skills such as memory or comprehension can hinder reflective critical judgement.

By teaching about memory, students can realise that their minds do not store and process information like a recording device, memory can mislead. Recognising the limits of one's memory fosters intellectual humility and a healthy scepticism about one's own knowledge, which are key dispositions in critical thinking (Facione, 1990). If learners know that forgetting and false memories are natural, they are more likely to double-check claims and seek external verification (e.g. looking up a source rather than relying purely on recall). Additionally, awareness of working memory limits encourages students to organise information and avoid cognitive overload during Problem Solving. Research in cognitive load theory shows that structuring problems to account for memory limits (for example, breaking complex tasks into sub-parts) allows deeper analysis without overwhelming the student (Halpern, 2013, p. 74; Willingham, 2019). Thus, teaching about memory helps students understand why they should take certain approaches in reasoning, and this is an example of the use of psychological content to achieve the teaching purpose of 'Better Decision Making'.

b. Cognitive Biases and Heuristics

Human cognition relies on many mental shortcuts (heuristics) that are efficient for everyday judgements in familiar circumstances but can introduce systematic errors, or biases, into our thinking. Cognitive biases and heuristics have a significant impact on critical thinking, often operating as invisible barriers to objective reasoning (Halpern, 2013, p. 298). Tom Chatfield, Diane F. Halpern, Stuart Hanscomb, Jack Lyons, Barry Ward, and Douglas Walton have

introduced cognitive biases and heuristics in their books, including confirmation bias (the tendency to favour information that confirms our preexisting beliefs), and the availability heuristic (judging likelihood by how easily examples come to mind), all of which can lead even intelligent people to draw faulty conclusions (Chatfield, 2017; Halpern, 2013; Hanscomb, 2023; Lyons & Ward, 2017; Walton, 2006).

In the context of teaching critical thinking, biases can manifest when students evaluate arguments or data. For example, a student might unknowingly select evidence that supports their opinion (confirmation bias) or rely on a personal anecdote rather than statistical evidence (availability bias), thus undermining the critical thinking ideal of fair and logical evaluation. Such biases not only cause errors in the moment but can also prevent students from applying their critical thinking skills consistently in new situations. One important concern here is motivated reasoning, which refers to the tendency to assess arguments in ways that favour conclusions one wants to be true. In this sense, motivated reasoning is not a separate bias so much as a process that can drive biased evaluation more generally (Maynes, 2015). As Chatfield (2017) and others note, evidence is then no longer judged on a neutral basis; emotions and desires can tilt evaluation so that a weak argument supporting one's own position may seem more convincing than a stronger argument on the opposing side.

Notably, cognitive biases are stubbornly persistent and do not disappear just because someone is educated or has high intelligence. Research in the psychology of reasoning has found that even people with strong general reasoning skills show typical bias effects, and sometimes greater confidence in biased reasoning the 'bias blind spot' phenomenon means we recognise others' biases more than our own (Maynes, 2015). Stanovich and West (2008) further note that more cognitively sophisticated individuals may in some cases be better at rationalising their biased views. This is why simply hoping students will 'think rationally' is not enough: without explicit attention, biases can continue to shape reasoning unconsciously. A student might learn argument skills in class yet fail to use them objectively beyond the classroom if their reasoning is skewed by unchecked biases triggered by environmental cues.

In Chapter Five, the analysis of course syllabuses reveals that many critical thinking courses

focus on how to analyse arguments but appear to lack content on cognitive biases and heuristics. This can reasonably be seen as a missed opportunity, because students may learn how to evaluate arguments in principle without being taught how their own judgement can be distorted in practice. Once a student can name and recognise cognitive biases and heuristics, they are better positioned to check whether it is influencing their thinking. Indeed, research finds that explicitly warning people about biases and prompting reflection can mitigate those biases in reasoning tasks (Korteling et al., 2023; Maynes, 2015; Stanovich & West, 2008). For example, simply instructing students to consider the opposite reasons why their initial answer or preferred conclusion might be wrong has been shown to reduce confirmation bias (Korteling et al., 2023). As knowing about cognitive biases and heuristics gives students a tool to self-correct their thinking, it is helpful in enhancing their critical thinking. Higher education that incorporates these ideas will likely see students who not only analyse arguments, but also analyse their own thinking processes, which exemplifies the advanced critical thinking skills (metacognition) mentioned in the opening chapter.

c. Role of Emotions in Critical Thinking

Seven textbooks (Stella Cottrell, Diane F. Halpern, Stuart Hanscomb, Ralph H. Johnson and J. Anthony Blair, Jill LeBlanc, Andrea A. Lunsford and John J. Ruszkiewicz, Jack Lyons and Barry Ward) acknowledge the profound impact of emotions and mood on decision-making. Emotions can affect critical thinking, sometimes facilitating it, but often biasing or impairing it if not managed. For example, anxiety or stress can narrow one's focus of attention and reduce working memory capacity, making it harder to consider a problem fully. Conversely, a mild positive mood might increase creativity but reduce careful analytical processing in favour of more heuristic thinking (Halpern, 2013; LeBlanc, 1998). Therefore, emotion and mood are relevant to critical thinking, as they typically introduce bias into reasoning. A student who feels strongly about a topic (perhaps due to personal values or experiences) may unintentionally engage in motivated reasoning, giving extra weight to evidence that aligns with their feelings and dismissing evidence that causes emotional discomfort.

If students cannot recognise when their emotions are interfering with their impartial evaluation of evidence, they look like they are reasoning critically but reach conclusions that

are predetermined by their feelings. At the extreme, strong emotions like anger, fear, or excitement can prevent critical thinking. Studies have documented a negative impact of intense emotion on decision-making quality. For instance, people in an angry state are more prone to impulsivity and simplistic black-and-white judgements; people who are afraid tend to overestimate risks (Dwyer, 2023). Without guidance on emotions, students may be less able to manage them. They might either let emotions drive their reasoning unchecked, or swing to the other side and assume that all emotional responses are misleading. However, as the following paragraph argues, emotion does not function only as an obstacle to critical thinking. The key is to achieve a balance through emotional awareness and regulation, so that emotion informs but does not dominate reasoning.

Five of the seven books (Diane F. Halpern, Stuart Hanscomb, Ralph H. Johnson and J. Anthony Blair, Jill LeBlanc, Andrea A. Lunsford and John J. Ruszkiewicz) emphasise the dual role of emotions in critical thinking, challenging the conventional view that emotions are just irrational impediments to decision making. They acknowledge emotions as potential sources of cognitive biases but also champion their utility as heuristics and forms of intelligent input that can help critical analysis. For example, in Lunsford and Ruszkiewicz's *Everything's an Argument*, Chapter 14 analyses a charity's photograph of a malnourished child. The photo quickly communicates the urgency of the issue and allows the audience to respond meaningfully even with limited cognitive resources. At the same time, this empathetic response may also lead audiences to overlook a more comprehensive evaluation of the long-term effectiveness of charitable organisations, or other causes with an equally worthy claim on their finite resources.

Understanding the influence of emotions is essential for developing critical thinking because it enables students to practice emotional metacognition: recognising when feelings might be influencing their judgement and taking steps to ensure reasoning remains unbiased. If students can become aware during the process of argumentation that strong emotional reactions to a particular claim may influence their judgement of the argument, they are much more likely to compensate, perhaps by seeking a neutral perspective or double-checking logic. Achieving this requires attention to emotions in critical thinking courses.

7.4.2.3 Scientific Knowledge

Scientific knowledge appears as a teaching content theme in four textbooks (Robert H. Ennis; Gregory Bassham, William Irwin, Henry Nardone and James M. Wallace; Walter Sinnott-Armstrong and Robert Fogelin; Jack Lyons and Barry Ward). Scientific Knowledge does not mean teaching students scientific facts or specialised disciplinary content. Instead, it refers to teaching evidence-handling practices that often feature in scientific reasoning, such as interpreting data displays, judging the credibility of observations, assessing what experiments can and cannot support, and understanding why scientific conclusions are usually tentative rather than final. In other words, the focus is on how claims are supported by evidence in scientific contexts and how readers can evaluate that support. Many arguments that students encounter in higher education and in everyday life rely on scientific-style evidence (for example claims about health, the environment, technology, and public policy). If students lack basic tools for understanding the strengths and limitations of such evidence, they may either accept conclusions too readily because the evidence looks 'technical', or reject well-supported claims because they misunderstand what the data show. Teaching Scientific knowledge therefore addresses a practical need: it equips learners to judge evidence-based claims more responsibly.

Ennis provides a practice-oriented route into this theme by focusing on how learners assess observations, experiments, and data displays. For example, he stresses the importance of checking titles and axis labels, and of asking whether 'the numbers or lines mean what they might at first seem to mean' (Ennis, 1996a, Chapter 10, pp. 277-278). This highlights a risk: graphs can appear clear and persuasive, while readers misinterpret what they represent. Ennis also recommends scatterplots and lines of best fit as tools for examining whether two variables are related. At the same time, he cautions that a relationship in the data does not establish causation, something that is a basic consideration in scientific thinking and that brings substance to the 'confusing correlation and cause' fallacy (Ennis, 1996a, Chapter 10, pp. 277-278). Sinnott-Armstrong and Fogelin develop the theme through a different route. They argue that science is not simply a matter of collecting data to confirm or disconfirm hypotheses, it also involves building theories that make sense of phenomena. Choosing among theories, in turn, requires judging which provides the best explanation (Sinnott-

Armstrong & Fogelin, 2005, Chapter 20, p. 423). The implication for critical thinking is that scientific conclusions should not be treated as raw 'facts'. They should be treated as theory-guided arguments. Evaluating them requires questions about what the theory explains, how well it fits the evidence, and whether competing theories offer a stronger account of the same data.

Across these textbooks, Scientific knowledge is presented less as a body of specialised facts and more as a set of reasoning demands that are strongly associated with scientific methodology and with core critical thinking skills. Students are prompted to ask whether evidence is credible, whether experimental results genuinely support the conclusion, whether alternative explanations have been considered, and whether claims that use scientific language actually meet the standards of scientific inquiry. Evaluating scientific claims requires analytical skill because students need to separate data from interpretation and identify the inferential steps linking evidence to conclusions. It can also support better decision making because many practical choices depend on assessing scientific information and recognising when evidence is weak, uncertain, or misrepresented.

At the same time, this theme raises a boundary question for stand-alone critical thinking teaching. Although the evaluation of scientific claims is relevant to critical thinking, explicit attention to experiments, theory choice, and scientific methodology moves the course some distance away from critical thinking's conceptual core and towards the methodology of science. In this respect, Scientific Knowledge is not as central or as self-evidently necessary as content such as argument analysis. Its inclusion may be practically valuable, especially where students regularly encounter scientific claims in academic or public contexts, but it also risks appearing somewhat arbitrary unless a clear rationale is given for why scientific evidence, rather than other domain-specific forms of inquiry, should receive separate treatment in a critical thinking course.

7.4.2.4 Value Judgements

Ennis emphasises the importance of Value Judgements in critical thinking. He mentions in the preface of his book that the primary purpose of critical thinking is to assist individuals

in making better decisions. However, when making decisions in everyday life, relying solely on facts is insufficient. For example, in decisions regarding environmental protection, factual judgements help us understand the specific impacts of pollution, while value judgements enable us to determine how much cost we are willing to bear for environmental protection. Effective decision-making requires understanding the relationship between facts ('what is') and values ('what should be'). Therefore, in Chapter Eleven, Ennis discusses how to differentiate between factual statements and Value Judgements, as well as how to make Value Judgements in real-life situations. Ennis believes that factual statements help us understand how the world operates and provide an objective basis for decision-making. They are statements about what has happened, which can be verified or falsified. Value Judgements, on the other hand, are based on personal or societal values and moral standards, guiding us on how to act based on these facts. They help us evaluate what is right or wrong, what is good or bad, and make choices accordingly. Without Value Judgements, it would not be possible to determine which facts are significant and how we should respond to them.

After introducing the concept of Value Judgements, Ennis explained how to use them in critical thinking, such as considering their consequences, listing pros and cons to weigh reasons, and applying the FRISCO model for decision-making (see above). Ennis emphasises the importance of factual accuracy, consideration of future consequences, and the formation of value principles through perceptive, sensitive reflection. Ennis also addresses relativism in Value Judgements, distinguishing between cultural and personal relativism, and critiques these positions while acknowledging the challenges they present to establishing universal value principles.

Value Judgements ensures that decision-making processes are holistic, considering not just the facts of a situation but also the value-based considerations (including ethical implications). By emphasising value judgements, critical thinking education fosters ethical sensitivity, making individuals more aware of this dimension of their decisions and actions. It encourages reflection on personal and societal values, helping individuals to better understand their own value systems and the impact of these values on their judgements and decisions. Without the value component, policymakers might focus only on data and lose

sight of why the data matters; without the factual component, they might have passionate values but disconnected from reality. Ennis stresses that by incorporating value judgements, critical thinking can bridge this gap (Ennis, 1996a, p. 297). At the same time, this theme may also raise a boundary question for critical thinking teaching. Once discussion moves beyond identifying the role of values in judgement and into questions about how value principles are justified and criticised, the content begins to overlap with normative and meta-ethical inquiry. Value Judgements are clearly relevant to critical thinking, but treating them as a separate content area requires some care, since the discussion can easily extend beyond critical thinking into ethical theory.

7.4.3 Conceptual differences among textbooks

7.4.3.1 Differences in views on the deductive arguments

While all the books discuss arguments, some differ in the extent to which they treat traditional deductive logic as central to critical thinking instruction. *Logical Self-Defense* (Ralph H. Johnson and J. Anthony Blair), for example, questions the adequacy of formal deductive logic as the main framework for analysing arguments in public discourse. The authors argue that traditional formal deductive logic is inadequate for analysing real-world arguments in public discourse, because such arguments often involve uncertainty, context-dependence, and varying degrees of support, which cannot be adequately evaluated using a system limited to binary valid-or-invalid judgements. To address this limitation, Johnson and Blair proposed the ARS criteria (Johnson & Blair, 2006, pp. xiii-xv). ARS stands for Acceptability, Relevance, and Sufficiency, each representing a distinct criterion for assessing the strength of an argument.

Acceptability (A): Johnson and Blair emphasise that a premise can be acceptable even if it isn't known with absolute certainty; what matters is that it is reasonable to accept in the context. For example, widely supported factual claims, credible expert testimony, or common knowledge tend to be acceptable. In formal logic, this issue is addressed more abstractly through the soundness requirement that premises be true, but formal logic is less concerned with the practical criteria by which acceptability is established in real-world contexts. By contrast, ARS makes acceptability an explicit criterion in argument evaluation.

Relevance (R): Relevance assesses the connection between premises and conclusions. A premise is relevant if, were it to be true, it would provide some support for the conclusion. Johnson and Blair (2006, p. xiii) include relevance to tackle a whole class of fallacies (often called fallacies of relevance) where an arguer gives reasons that may be persuasive but are logically beside the point. The ARS approach insists that every premise should contribute to establishing the conclusion. If a premise is irrelevant, the argument is deficient, even if no formal rule is broken. Relevance is thus crucial for analysing arguments, ensuring that we focus on reasons that address the point at issue.

Sufficiency (S): In addition to all premises being acceptable and relevant, Johnson and Blair propose a third criterion, whether the premises provide sufficient reasons to justify the conclusion. Sufficiency is about the strength or degree of support. Many everyday arguments fail, not because their premises are false or irrelevant, but because they are insufficient, the evidence is too weak or incomplete to warrant the conclusion. In other words, do the premises, taken together, make the conclusion highly likely to be true? Although formal logic can also address strength of support in the case of inductive arguments, critical thinking and informal logic place greater emphasis on how standards of sufficiency vary across real-world contexts and on what may count as enough evidence in practice.

Similar to the ARS guidelines, Douglas Walton (2006, p. 69) argues that plausible arguments provide an alternative to traditional deductive and inductive reasoning in contexts where judgement must be made under practical limitations, including incomplete information and uncertainty. Plausible arguments are highly practical and typically support claims on the basis of what is reasonably or normally expected in familiar situations. This approach draws on common knowledge or typical outcomes as a basis for argument. The conclusions reached through plausible arguments are therefore provisional rather than final, but in such cases, the burden of proof shifts to anyone challenging the claim (Hanscomb, 2023, pp. 119–121). Understanding this form of argument helps explain how rational judgement remains possible even when information is incomplete.

7.4.3.2 Differences in views on probability

Seven of the books address the role of probability in decision-making. Six of these (Diane F. Halpern; Jack Lyons and Barry Ward; Tracy Bowell and Gary Kemp; Walter Sinnott-Armstrong and Robert Fogelin; Tom Chatfield; Stella Cottrell) view probability as a useful tool to aid in judgement. They suggest that probabilistic thinking can strengthen the assessment of arguments by providing a more disciplined way to talk about uncertainty and degrees of support. As discussed, many arguments and decisions do not take place under conditions of certainty, but under incomplete information and uncertainty. Without a probabilistic perspective, students may either treat the mere presence of evidence as if it were sufficient, thereby overestimating the strength of support, or dismiss probabilistic evidence because it falls short of certainty, thereby underestimating what the evidence reasonably supports. This overlooks the fact that certainty is often unavailable in multiple contexts, including scientific investigations. Introducing probability as a teaching content area can therefore provide critical thinking with a more rigorous language for expressing degrees of support.

This point is illustrated clearly in Bowell and Kemp's treatment of inductive reasoning. They explicitly link the strength of an inductive argument to the probability of the conclusion given the premises, and they discuss its connection to probability theory in detail (Bowell & Kemp, 2014, p. 125). Bowell and Kemp quantify this: an inductively strong argument is one where that conditional probability is greater than 0.5 (more likely true than not). This approach enables students to discuss how strong the support is for a conclusion, rather than relying on vague judgements such as it seems reasonable.

Halpern situates probability within a broader framework of judgement and decision-making under uncertainty. Through topics such as base-rate neglect, the gambler's fallacy, thinking with frequencies, and the problem of false positives, she alerts students to the kinds of intuitive errors that commonly arise when people reason about risk and statistical information (Halpern, 2013, p. 381). Lyons and Ward likewise emphasise the value of probabilistic tools by introducing frequencies and frequency trees alongside Bayes's theorem, showing how representing evidence in frequency form can make complex uncertainty easier

to track and update (Lyons & Ward, 2017, p. 217). Probability provides critical thinking with a method for updating beliefs considering new evidence, enabling students to revise their judgements in a more defensible way, rather than relying on impressions or on isolated pieces of evidence.

A contrasting position is offered by Richard L. Epstein (2018) in *The Fundamentals of Argument Analysis*, where reservations are expressed about incorporating probability into argument analysis (p. 161). In particular, he questions whether probability can serve as a clear and shared standard for judging degrees of support in ordinary reasoning, especially in cases involving unique events or contexts where probability estimates depend heavily on individual judgement (p. 181). This concern is important because it suggests that probability may not function in critical thinking as a precise or universally applicable decision procedure. Rather, its place in critical thinking raises a broader interdisciplinary challenge. On the one hand, probability offers a tool for quantifying uncertainty, thereby giving argument analysis a more rigorous basis for evaluating the likelihood of premises and conclusions. On the other hand, the practical use of probability in everyday argumentation does not always align neatly with the more precise mathematical formulations found in statistics and research methods. If critical thinking is concerned with helping students evaluate arguments across different real-world contexts, then reasoning under uncertainty can still reasonably form part of that task, even if probability does not provide an exact or uniform standard in every case. On this view, probability belongs in critical thinking as a bounded but important resource for reasoning under uncertainty. Its educational value lies less in supplying exact decision rules than in equipping students to ask the critical questions required for responsible judgement under conditions of uncertainty. Further discussion of the educational role of probability, and of how it may be incorporated into critical thinking teaching in practice, is provided in Chapter Ten.

7.4.4 Implications for curriculum design

The statistics and comparisons in this chapter suggest that argument analysis can serve as the central organising element of a critical thinking course. Defining, reconstructing, and evaluating arguments does more than introduce a single topic. It gives students a repeatable

way to move from a claim, to the reasons offered for it, and then to a warranted judgement about whether those reasons provide enough support. This sequence also provides a practical basis for introducing other content themes. For example, fallacies can be taught as recurring ways in which reasoning fails; language and definition can be used to reduce ambiguity and improve precision in forming premises and conclusions, and psychological or probabilistic topics can be introduced to help students check how evidence is selected, weighed, and interpreted. Additional skills can be taught as developments of the same underlying activity of assessing reasons and support, rather than as separate topics that sit alongside argument work without a clear connection. On this basis, teachers have the flexibility to embed several 'functional content' according to different teaching purposes. If the course aims to improve the quality of everyday decision-making, probability and Value Judgements can be added to help students weigh uncertain information. If the focus is on effective communication, dialogue types and constructive dialogue can be embedded to help students apply argumentation principles in discussions. For example, learning to avoid fallacies such as the straw man is not only a matter of sound reasoning, but also a condition of productive dialogue: students need to represent others' views accurately, avoid mischaracterisation, and be able to identify when these standards are violated in discussion. If the goal is to cultivate critical thinking dispositions, then it can be combined with psychological content (cognitive biases, emotional influences) and constructive dialogue training to guide students to metacognitive reflection and develop habits of openness and humility. In this way, different combinations such as 'argument + psychology', 'argument + dialogue', and 'argument + probability' can be developed while retaining argument analysis as the common core of the course.

When putting these topic combinations into practice, teachers can assign distinct teaching methods to each topic so that content, delivery and assessments reinforce each other. Take the 'argument + probability' topic as an example. Students can begin by completing a simulation scenario that requires them to make a decision with uncertain information. The teacher can then introduce an accessible probabilistic tool, such as conditional probability, understood as the probability of an event occurring given that another event is true or has already occurred. In critical thinking teaching, this is useful because it provides a more

disciplined way of asking how strongly a piece of evidence supports a conclusion. Rather than treating arguments as simply convincing or unconvincing, students are encouraged to consider how new evidence changes the likelihood of a claim and therefore the degree of confidence that is warranted. They can then assign rough numerical weights to premises before reassessing the overall strength of the argument. To keep the exercise concrete rather than purely abstract, the simulation can be framed around a short clip from *Moneyball* lasting two to three minutes. The film contrasts two player-recruitment strategies: conventional scouting based on experience and intuitive judgement, and a data-driven sabermetric approach that uses player-performance statistics to identify undervalued players. Using information supplied in the simulation, students estimate the expected outcomes of the two strategies and determine which is better supported by the probabilistic evidence. They subsequently deliver group reports that explain their calculations and assumptions, and they reflect on how neglecting probabilistic analysis can foster 'certainty illusions' or 'representativeness biases'. This design integrates three elements within a single class session: the film provides an intuitive case, probability calculations provide quantitative support for the argument, and the combination of oral, written, and collaborative tasks enhances both argument analysis and communication skills.

It should be noted that the teaching model outlined here is only a preliminary example. It catalogues reusable elements: argument analysis as the core, together with optional topics on probability, value judgements, dialogue, and psychological factors, which designers can combine in various ways. The eventual inclusion and weighting of these topics might be guided by higher-education policies, institutional priorities, the characteristics of specific student cohorts, or teacher preferences. At this stage, these elements are treated as candidates for later synthesis rather than as a ready-made model for Chinese higher education. Their relevance and weighting are considered alongside the Chinese research, syllabus, and policy evidence in Chapter Ten, while their practical value in particular settings would still require empirical testing.

7.5 Chapter summary

This chapter presents a thematic analysis of 22 critical thinking textbooks and uses these

books to extend the syllabus-based picture developed in Chapters Five and Six. Using an abductive coding approach and the shared three dimensional framework of teaching purposes, teaching content, and teaching methods, the chapter reports frequency patterns, identifies additional themes that emerged from textbook analysis, and compares textbook results with the Western syllabus dataset to clarify what becomes more visible when the same framework is applied to a different form of teaching material.

The coding results suggest that textbooks present a fairly consistent set of purposes and content themes. In purposes, Develop Analytical Skills and Develop Critical Thinking Dispositions appear in all textbooks (100%), with Better Decision Making and Effective Communication also common (each 82%). In content, all books cover the full argument analysis sequence, and they also include Fallacies and Critical Thinking Dispositions as Content (all 100%). Other content themes appear less often, including Dialogue and Communication as Content (23%), Academic Development (18%), and Problem Solving (18%). In methods, Active Learning is consistently visible (100%), whereas other method labels are stated less consistently (14% to 36%), which may partly reflect the fact that textbooks provide tasks but do not always specify delivery formats.

One contribution of the textbook analysis concerns the level of detail it provides within the content dimension. What earlier chapters coded more broadly as Argument Analysis is presented in textbooks as a staged instructional sequence. Students are introduced to what arguments are, how to recognise them in natural language, how to reconstruct them into assessable form, how to classify them by type, and how to evaluate their strength. This sequence provides a clearer indication of how analytical development is operationalised in teaching materials and helps to explain why argument focused work can be used as an organising thread in critical thinking instruction. The textbook dataset also makes Fallacies and Critical Thinking Dispositions as Content more consistently visible than syllabus documentation, which may reflect the fact that these topics lend themselves to definition, illustration, and practice tasks within textbook genres.

Beyond the review derived framework, the textbook analysis identifies additional content

themes that are often implicit or not separately listed in syllabus materials. Language and definition appears in all 22 books (100%), indicating that textbooks commonly treat ambiguity, vagueness, and definition setting as foundational for argument evaluation. Several themes appear in a minority of books, including The Role of Emotions (32%), Probability (32%), and Cognitive Biases and Heuristics (23%), with Scientific knowledge (18%) appearing in a smaller set. Two themes, The Role of Memory (5%) and Value Judgements (5%), appear only in single textbooks. Although infrequent, these examples illustrate how some authors extend critical thinking beyond argument structure to include cognitive limitations and normative reasoning as explicit teaching content. Taken together, these themes suggest that a subset of textbooks frame critical thinking in ways that connect argument evaluation to language use, psychological influences, scientific evidence handling, probabilistic judgement, and value informed decision making.

The chapter also identifies two limitations that affect interpretation. First, the coding strategy records each theme in binary form (present or absent, coding can be found in Chapter Three). For example, a brief mention of probability and a fifty-page chapter on statistical reasoning both score ‘1’(present), even though the pedagogical value differs markedly. The weighting can be a further indication of what each textbook focuses on and what core content is emphasised. Therefore, researchers interested in this can further deepen my research and explore the dominant themes in different textbooks. Second, the presence of a topic in a textbook does not guarantee that a teacher using that book will emphasise it, nor does its absence mean that it is not taught through supplementary materials. In the absence of in-depth interviews with a substantial number of teachers about how they use textbooks in practice and what they actually cover in class, this study could not determine how textbook content is implemented in teaching.

Within the overall structure of the thesis, this chapter adds textbook-based evidence on how critical thinking content is presented and practised in teaching resources and identifies content elements that syllabuses may leave implicit. Building on this mapping, Chapter Eight shifts the focus from teaching materials to the teacher survey. The survey data provide a practice-based perspective on how teachers frame the purposes of critical thinking courses,

which content areas they prioritise, and which teaching methods and assessment approaches they consider workable. It also captures constraints and difficulties that are not visible in textbooks, including student engagement, assessment pressures, and other challenges that shape how critical thinking teaching operates in real classrooms.

Chapter Eight: Thematic analysis of survey results

8.1 Introduction

In Chapter Seven, I conducted a thematic analysis of 22 Western critical thinking textbooks. This analysis confirmed the central role of argument analysis in Western critical thinking education and identified areas, including probability, psychological factors, and dialogue. However, both textbooks and syllabuses represent only the planning and potential level of teaching. They do not capture teachers' lived teaching experiences or the practical challenges encountered in real classrooms. To address this gap, I surveyed Western higher education teachers using an online questionnaire to capture their experiences of teaching critical thinking.

This chapter has two research objectives. First, it compares teachers' accounts of course purposes, content, and methods with the patterns identified in the earlier syllabus and textbook analyses, while remaining open to practices not captured in those sources. Second, it identifies the difficulties and challenges reported by participating teachers, thereby providing practice-based evidence that can inform later consideration of course design and implementation conditions in Chinese higher education.

The survey collected basic information about the course (whether it is being taught now or has been taught before, whether it is compulsory or optional, what textbooks were used and the type of students taking the course). It also collected information about the teacher's teaching approach and experiences (purposes, content, methods, and challenges encountered in teaching). The findings section details the results for each question.

Survey dates, participant inclusion criteria, recruitment procedures and the analysis steps of data are detailed in the Methodology chapter. To ensure the reproducibility and transparency of the survey analysis, all coding processes (raw data, codes and themes) are documented in the Appendix G1.

Twenty-eight responses were received in total, with nine indicating 'I have not taught critical thinking' and the remaining nineteen included in the analysis. To analyse the survey data, abductive thematic analysis was employed, following the approach outlined by Braun and Clarke (2006). This chapter presents the findings of the analysis and discusses the coding results.

8.2 Findings

Questions 1 to 4 provide contextual information about the participants, forming the first section. Questions 5 to 11 capture participants' experiences, forming the second section.

Section 1: Participants' Context (Q1 to Q4)

Q1: Teaching Status

Participants were asked whether they are currently teaching a critical thinking course or have taught one in the past. 14 participants reported actively teaching a critical thinking course. An additional 5 participants have taught a critical thinking course in the past, though they are not currently doing so. Their most recent teaching experiences with critical thinking courses span from 2012 to 2022.

Q2: Student Profile

The second question asked about the typical audience for critical thinking courses. Most participants reported teaching critical thinking primarily to undergraduate students (n = 16). One participant teaches a course that includes both undergraduate and graduate students, while another teaches a course that includes both undergraduate students and adult learners. One participant reported teaching exclusively adult learners.

Q3: Course Status - Compulsory vs. Optional

Teachers were asked whether their critical thinking courses are optional or compulsory within degree programmes. More participants reported that their courses are offered as optional or elective (n = 10). The remaining participants indicated that their courses are compulsory or core components (n = 9), often as part of a specific degree programme such as Philosophy, Politics, and Economics (PPE), Sociology, Criminology, Childhood Studies,

or Management.

Q4: Use of Textbooks and Teaching Materials

Teachers were asked about their use of textbooks in critical thinking teaching. Of the 19 participants, 12 reported using one or more textbooks, while seven reported not using textbooks. Among those who did not, one participant did not provide a reason. The others described relying on a wider mix of materials drawn from different disciplinary areas, including argumentation, psychology, education, and philosophy; using self-created materials; allowing students to choose study skills or critical thinking texts that best fit their needs; avoiding dependence on a single text to maintain exposure to diverse viewpoints; prioritising scholarly texts that better match a specific framework; or primarily using journal articles rather than a core textbook.

Section 2: Participants' Experiences (Q5 to Q11)

This section reports findings from the teacher survey based on responses to Questions 5-11, which asked participants to reflect on their experience of teaching critical thinking. Specifically, Question 5 asked what works particularly well in their teaching, including course content, teaching methods, or assessments. Question 6 asked whether they use anything unusual or unconventional. Question 7 asked what does not work well. Question 8 asked participants to state what they see as the main purpose(s) of critical thinking courses and their value for students. Question 9 asked about the biggest challenges in teaching critical thinking. Question 10 invited recommendations for setting up a new critical thinking course, again with reference to content, methods, or assessment. Finally, Question 11 provided an open space for any additional comments about their teaching experiences. Responses to these questions were coded using the same framework developed in the scoping review and applied in the syllabus and textbook analyses. At the same time, because the analysis was abductive, responses that were not adequately captured by the existing purpose-content-method framework were coded separately and developed into additional themes. To support comparison across datasets, themes are organised using the same frequency tiers as earlier chapters: Standard (80-100%), Frequent (50-80%), Non-standard (20-50%), and Uncommon (0-20%). Given the relatively small survey sample (n = 19),

category boundaries are treated cautiously, and themes close to cut-off values are interpreted as indicative rather than definitive. The results can be found in Table 8-1.

Table 8-1 Coding results of teacher survey (n = 19)

(A) Themes derived from the scoping review framework

Dimension	Theme	Number	Percentage (%)
Purpose	Develop Analytical Skills	17	89%
	Better Decision Making	9	47%
	Develop Critical Thinking Dispositions	8	42%
	Effective Communication	7	37%
	Enhanced Learning	6	32%
	Civic Engagement	1	5%
	Develop Creativity	0	0%
Content	Argument Analysis	17	89%
	Critical Thinking Dispositions as Content	7	37%
	Foundations and Importance of Critical Thinking	3	16%
	Fallacies	2	11%
	Academic Development	1	5%
	Problem Solving	1	5%
	Dialogue and Communication as Content	0	0%
Method	Active Learning	12	63%
	Written Learning	7	37%
	Oral Learning	7	37%
	Collaborative Learning	6	32%
	Technology-Enhanced Learning	1	5%

(B) New themes emerging from teacher survey responses

Dimension	Theme	Number	Percentage (%)
Methods	Flipped Classroom	3	16%
	Humble Teacher Stance	2	11%
	Mitigating Student Anxiety	2	11%
Challenge	Content is difficult	7	37%
	Student indifference	7	37%
	Some assessments are misaligned with teaching critical thinking	6	32%
	Student mindset barriers	5	26%
	Lack of a precise definition of critical thinking	3	16%
	Teaching fallacies has no effect	3	16%

In the teaching purpose dimension, one theme clearly dominates. Develop Analytical Skills is stated by 17 teachers (89%), placing it in the Standard tier. This aligns with the syllabus and textbook datasets, where analytical skill development and argument work also form the most stable core. Other purposes are reported less consistently: Better Decision Making (9/19, 47%) and Develop Critical Thinking Dispositions (8/19, 42%) fall in the Non-standard tier, followed by Effective Communication (7/19, 37%) and Enhanced Learning (6/19, 32%). Civic Engagement is Uncommon (1/19, 5%), and Develop Creativity is absent (0%). Compared with syllabuses, which often list a wider set of course purposes, the survey responses suggest that teachers tend to highlight a smaller number of purposes when describing their courses. A plausible reason is that syllabuses serve programme and quality-assurance functions and therefore spell out broader outcomes, whereas survey responses reflect what teachers most readily foreground as the aims of their teaching.

In the teaching content dimension, the strongest consistency is again concentrated in one theme. Argument analysis is reported by 17 teachers (89%), placing it in the Standard tier. This is consistent with the earlier datasets: syllabuses commonly state argument analysis, and textbooks present it in a structured sequence of steps. By contrast, several content themes

are much less visible in the teacher survey. Critical Thinking Dispositions as Content is Non-standard (7/19, 37%), while Foundations and Importance of Critical Thinking (3/19, 16%), Fallacies (2/19, 11%), Academic Development (1/19, 5%), and Problem Solving (1/19, 5%) are Uncommon. Dialogue and Communication (as content) is not reported (0%). This differs from the textbook analysis, where Fallacies and Critical Thinking Dispositions as Content were consistently present. Textbooks, as discussed in the previous chapter, are typically aiming for thorough coverage of the field, whereas a specific critical thinking class will be selective because of time restraints or teacher knowledge and preferences. Also, it should be acknowledged that survey responses often summarise teaching in a small number of headline points, and some teachers may treat areas such as fallacies, definitions, or foundational discussion as part of argument work rather than as separate named topics.

In the teaching method dimension, the main pattern is that active learning is widely reported, but specific formats vary. Active Learning is Frequent (12/19, 63%), whereas Written Learning (7/19, 37%), Oral Learning (7/19, 37%), and Collaborative Learning (6/19, 32%) are Non-standard. Technology-Enhanced Learning is Uncommon (1/19, 5%). Compared with syllabuses, where a wider range of methods tends to be recorded, the teacher survey appears more selective. Syllabuses often specify delivery arrangements because they describe how a course will run, whereas teachers' survey responses may focus on the main teaching approach and may not list routine formats unless they are distinctive. It is also possible that many classroom tasks are active in the sense of requiring students to work on examples and exercises, but are not described by teachers using labels such as oral, collaborative, or technology-supported, which reduces the visibility of those method themes in the survey coding.

Table 8-1 (B) highlights themes that were not apparent in the syllabus and textbook datasets, especially those related to implementation challenges, student response, and assessment. This is not unexpected. Syllabuses summarise course purposes, content, and assessment structures, while textbooks mainly present critical thinking content, examples, and exercises rather than reflecting on the practical difficulties of teaching. Several themes are reported by a substantial minority: Content is difficult (7/19, 37%) and Student indifference (7/19, 37%)

point to challenges of cognitive demand and engagement, while Some assessments are misaligned with teaching critical thinking (6/19, 32%) indicates tensions between intended learning and what assessment rewards. Student mindset barriers (5/19, 26%) suggests that entrenched habits or resistance may limit uptake of critical thinking instruction. Other themes are mentioned less often but highlight recurring concerns or strategies, including Flipped Classroom (3/19, 16%), Lack of a precise definition of critical thinking (3/19, 16%), Teaching fallacies has no effect (3/19, 16%), Humble Teacher Stance (2/19, 11%), and Mitigating Student Anxiety (2/19, 11%). These findings extend the earlier analyses by showing that, from teachers' perspectives, the main issues are not only what critical thinking consists of, but also whether students are willing and prepared to engage with challenging material and whether assessment practices support the intended learning. To clarify what these new themes mean in practice, Table 8-2 provides brief definitions and illustrative excerpts from participants' responses, showing how each theme was expressed in teachers' own words.

Table 8-2 Definitions and illustrative examples for new themes

Dimension	Theme	Original Text	Participant
Teaching methods	Flipped Classroom: teaching content (lectures, readings, quizzes) happens before the scheduled class meeting, while class time is reserved for active learning (discussion, application, and teacher-led questioning). This method aims to deepen critical thinking practice by shifting passive listening to homework and using group or guided work to scaffold critical thinking skills during contact hours.	*For me, that means that I do not lecture...at all. Instead, I have crafted scaffolded activities the students complete prior to class (or before discussion for asynchronous online sections) and then I facilitate the activity and ask guiding questions where they dig deeper, attempt practice problems, and gain clarity.*	11
	Humble Teacher Stance: teachers actively acknowledge that they are not omniscient, show respect for	*If you're just getting started, be humble and realize that you don't (can't) immediately know*	11

	students' ideas, and by modelling humility themselves, create a relaxed classroom atmosphere that encourages students to ask questions and think critically.	*the answer to every unique question students ask--it is okay to say you need to think about it (and then actually do so) or task the class with considering the question.*	
	Mitigating Student Anxiety: This theme refers to reducing the pressure for grades, thereby allowing students to feel safe to take intellectual risks. Shift the focus from 'pleasing the teacher' to genuine inquiry.	*I think it's important to find ways to downplay grading when you are trying to teach critical thinking. The research shows that grades negatively impact students' willingness to take risks in their writing and their thinking, and that grades cause students to try to please the teacher rather than think for themselves.*	10
Teaching challenges	Content is difficult: Complex concepts like Bayes' Theorem, Mill's Methods, and natural deduction may be challenging for students to understand.	*I admit that my curriculum was too difficult for too many students. I would remove some of the more challenging exercises and exams items if I were still teaching.*	18
	Student indifference: This theme denotes students' disinterest in learning critical thinking; specifically, when the material is not clearly connected to their personal, academic, or professional lives, they lack the motivation to invest effort in developing these skills.	*Students may struggle to see the relevance of what they are learning, which can diminish their motivation and engagement.*	4

	Some assessments are misaligned with teaching critical thinking: This means that while courses aim to develop students' ability to analyse reasons, some commonly used assessment formats do not adequately measure these skills. For example, final examinations often prioritise memory and speed rather than quality of reasoning; group assignments can allow some students to rely on the work of others, which can obscure individual competence; and single, one-off tasks make it difficult to capture students' reasoning ability in a stable and reliable way. As a result, students may learn how to maximise grades without necessarily developing genuine critical thinking skills.	*Requiring a cumulative final emphasizes rote memorization and does not show higher level learning or critical thinking.*	6
	Student mindset barriers: Some students misunderstand that critical thinking is only about criticising opinions, find it difficult to change their beliefs on the basis of evidence, and are accustomed to passive learning and searching for standard answers. These misperceptions lead to their inability to learn and apply critical thinking skills effectively, making it more difficult to teach.	*When asked to honestly evaluate positions, students (like many adults) have trouble changing their minds when the evidence shows their prior belief was false.*	7

	Lack of a precise definition of critical thinking: this theme reflects some teachers' concerns that without a clear, shared understanding of definition, it becomes difficult to design instruction or measure its outcomes.	*One's chosen definition of CT should separate it from just problem solving, good thinking, creative thinking, or reflective thinking. Ralph Johnson has written about this. Michael Scriven has also in early papers in CT News, i.e., "The Prostitution of CT."* *One problem is everyone in your university thinks they are teaching CT.*	7
	Teaching fallacies has no effect: This theme reflects teachers' doubts about the teaching value of traditional informal fallacies.	*I have given up on informal fallacies -- I don't think they're as valuable as traditionally supposed*	2

It is worth noting that, although several new themes were identified during the coding process, in the original survey text these items appear only in a highly abbreviated form and are not accompanied by any background explanation or further elaboration. (For example, the theme 'Lack of suitable textbooks' is represented only by the phrase 'a big challenge was finding a suitable textbook'.) As these instances do not provide sufficient contextual detail for confident thematic definition or extended analysis, they are presented here solely as 'mentioned but not fully elaborated' themes. The codes are shown in Table 8-3.

Table 8-3 Mentioned but not fully elaborated categories

Dimension	Theme	Original Text	Participant
Teaching content	Social Epistemology (2)	*The incorporation of social epistemology*	2
		I mix logic/probability with social epistemology	12
	Numerical Literacy (1)	*We focus on numerical literacy in our module.*	3
Teaching methods	Learner-Centred Teaching (1)	*Learner-Centered Teaching*	11
	Using Academic examples (1)	*Using academic examples*	5
Teaching challenges	ChatGPT (1)	*ChatGPT*	12
	Integrate English Grammar (1)	*We tried to integrate instruction in English grammar. That was a waste of time.*	7
	Lack of Suitable Textbooks (1)	*a big challenge was finding a suitable textbook.*	1
	Untrained Professors Struggle Teaching Critical Thinking (1)	*Also, professors not trained in philosophy struggle with teaching CT.*	7

Taken together, the teacher survey results reinforce a shared core across the scoping review, syllabus analysis, and textbook analysis - the centrality of argument analysis and the aim of developing analytical skills. At the same time, the survey evidence differs in what it makes visible. It concentrates on a smaller set of headline purposes, content, and methods, and it introduces implementation constraints that are not captured well by course syllabuses or textbooks.

8.3 Discussion

The teacher survey reinforces the shared core identified in the earlier datasets, most notably the centrality of developing analytical skills and teaching argument analysis. Building on

this overlap, the present discussion focuses on teacher-reported themes that emerge from the teacher survey. These themes are examined in relation to teaching methods and challenges, with particular attention to the implementation issues they reveal and their possible relevance to critical thinking course design in Chinese higher education.

8.3.1 Teaching methods

8.3.1.1 Flipped Classroom

In this survey, a small minority of teachers described using a flipped-classroom structure (3/19), in which foundational content learning is assigned outside class (e.g., via readings or short lecture videos), freeing class time for active learning and higher-order thinking tasks (Nugraheni et al., 2022). In a critical thinking course, this typically involves guided pre-class preparation, so that students arrive having engaged with core concepts and frameworks, and classroom sessions can focus on applying those ideas through analysis and discussion. The pedagogical rationale is that by inverting the traditional teaching sequence, it ensures that class time is spent practicing reasoning and evaluation rather than passively receiving information.

One study found that a flipped approach led to significantly greater gains in students' critical thinking skills and dispositions than a traditional lecture-based format (Zulhamdi et al., 2022). The authors argue that flipped teaching helps students move beyond memorisation and engage more fully in higher-order cognitive work, especially analysis, evaluation, and reconstruction, which are central to critical thinking. More broadly, research suggests that well-implemented active learning approaches can improve academic performance and deepen understanding (Orhan, 2023). Related evidence also suggests that flipped teaching may create more space for reasoning practice and for the transfer of higher-order skills to other academic work (DeRuisseau, 2016). These studies suggest that flipped teaching is well aligned with the skill-development focus of critical thinking courses: it moves basic content delivery outside class and reserves class time for guided practice, questioning, evaluation, and revision. Although it appears only as a minority strategy in this dataset, this may reflect uneven familiarity with the model, differences in access to or uptake of teaching technology, or the fact that some teachers developed their practice before such approaches became

widespread, rather than any lack of fit with critical thinking itself.

Despite the many advantages of the Flipped Classroom approach, its implementation in practice presents several challenges (Nugraheni et al., 2022). First, if students lack self-discipline and time management skills, they often struggle to complete the required pre-class preparation. This can weaken the foundation for in-class activities and significantly compromise the overall effectiveness of teaching. Second, the increased emphasis on classroom activities raises the complexity of course design and group learning management. If not properly organised, student discussions may become superficial and unproductive. Implementing a Flipped Classroom requires teachers to invest considerable time and effort in creating or selecting instructional videos and designing guiding materials. Assessing the effectiveness of these materials is also a challenge. The substantial preparatory workload, combined with the uncertainty of students' engagement with pre-class learning, may limit the effectiveness of the Flipped Classroom. These constraints may be significant in the context of Chinese critical thinking courses, where both students and teachers may be more accustomed to lecture-based instruction. In such settings, a flipped model may represent not just a change of technique but a broader shift in teaching and learning expectations.

8.3.1.2 Humble Teacher Stance

Humble Teacher Stance refers to an open-minded attitude adopted by educators, acknowledging that they themselves may make mistakes, respecting students' ideas, and positioning themselves as co-learners rather than absolute authorities. According to the Paul-Elder model of critical thinking, intellectual humility involves recognising the limits of one's knowledge and being mindful of the possibility of error in one's beliefs (Paul & Elder, 1992). A teacher who models this humility creates a classroom ethos of inquiry and mutual respect (Paul & Elder, 2006). This helps cultivate critical thinking dispositions: open-mindedness, curiosity, and a willingness to question assumptions (even the teacher's). By taking a humble stance, the teacher demonstrates how to engage with ideas critically yet respectfully. Research on classroom atmosphere shows that when teachers normalise mistakes and emphasise growth, students feel more comfortable admitting what they do not know (Goldrick-Rab & Stommel, 2018). This comfort is helpful in critical thinking teaching,

where students need to voice uncertainties, ask questions, and consider counterarguments without fear of being 'wrong.' Therefore, there are reasons to believe that a Humble Teacher Stance turns the classroom into a place for thinkers who jointly seek better understanding, which is conducive to achieving the teaching purpose of developing critical thinking dispositions.

8.3.1.3 Mitigating Student Anxiety

Mitigating Student Anxiety refers to creating a supportive classroom environment that reduces stress, fear of failure, and feelings of intimidation, thereby fostering a psychologically safe space that promotes deep learning. Some critical thinking teachers adopt practices such as employing formative rather than summative assessments (participant 11), and downplaying the emphasis on grading, as these approaches reduce performance pressure (participant 10). Anxiety is known to negatively impact cognitive engagement, particularly in critical thinking contexts where students are routinely prompted to challenge deeply held beliefs, publicly debate viewpoints, and openly evaluate arguments. If students fear failure or judgement, they may divert from constructive inquiry towards defensive behaviours, constraining their ability to critically engage with content. One study suggests that classrooms characterised by psychological safety facilitate not only cognitive engagement but also meaningful intellectual risk-taking, thereby enabling deeper exploration, constructive dialogue, and more analytical skill development (Vnenchak et al., 2019).

8.3.2 Teaching challenges

8.3.2.1 Content is difficult

Complex content, such as Bayes' Theorem, Mill's Methods (which are sometimes taught in critical thinking courses as tools for analysing causal reasoning), and formal logic, often overwhelms students. Teachers may spend significant class time explaining difficult ideas instead of guiding students in applying them. Thus, learning becomes about understanding content itself, rather than developing critical thinking skills through practice. This aligns with research stating that abstract concepts can limit learners' ability to think critically by causing confusion and overload (Díaz & de la Fuente, 2007). Teachers report seeing

disengagement or worry among students facing complex logic or probability questions (Participant 1).

Several factors may explain why critical thinking content is sometimes perceived as difficult. The issue does not appear to lie in critical thinking as such, since the earlier textbook analysis suggested that formal logic occupies only a limited place in most materials. Rather, difficulty may arise in courses that include more abstract elements, such as probabilistic reasoning, causal analysis, or formalised approaches to inference, especially when students have not encountered such material before. Without prior experience or clear examples, students find it hard to relate new ideas to their existing knowledge. Institutions may also rush through complex topics due to tight schedules, leaving little chance to build strong basic understanding. Cognitive load theory states that learners struggle if materials exceed their readiness or prior knowledge level (Kirschner, 2002). When content is overly abstract or difficult this will hinder the development of their critical thinking skills, and cause some students to lose interest in the subject.

In some cases, reducing difficult content may be justified, particularly where the material is relatively specialised and not central to the aims of a critical thinking course. However, where the difficulty lies in concepts that are essential to the course, removing them may weaken its intellectual substance. A more appropriate response in such cases is to retain the key ideas while adjusting how they are taught. As a matter of good teaching practice, complex ideas can be broken into smaller steps, each supported by clear examples and brief feedback so that understanding is built gradually. In the context of critical thinking teaching, one way of doing this is through short case-based exercises of the kind commonly found in critical thinking textbooks, where students apply a concept to a concrete scenario and then justify their judgement. For instance, a probability topic might be taught through a brief ‘false positive’ case in which a student must distinguish between a positive test result and the probability that the person actually has the condition. In Sinnott-Armstrong and Fogelin’s example, students are given the base rate of the disease, the test’s sensitivity, and the false-positive rate, and are then asked to work out how likely it is that the hypothesis is true given the evidence of a positive result (Sinnott-Armstrong & Fogelin, 2005, pp. 253-254). The

exercise helps students avoid a common error in judgement, namely treating 'the test is positive' as if it directly implies 'the person probably has the disease'. Instead, it makes them track how the conclusion depends on prior probability and conditional probability, and it shows how the strength of an inference can change once these factors are taken into account. These activities help students see what the concept is for and how it changes the quality of their reasoning, which can support motivation as well as comprehension. While these approaches offer plausible ways to address the challenge, their effectiveness should not be assumed, and further research is needed to examine their impact on student engagement and on the development of critical thinking.

8.3.2.2 Student indifference

Student motivation is widely recognised as a basic condition for learning, and teachers in this survey frequently described indifference or low perceived relevance as a practical barrier to critical thinking teaching. Teachers reported that indifference shows as low energy and little involvement. Many things cause student indifference. Participants described student indifference in terms of specific orientations towards the course. Participant 4 reported that some students struggled to see how critical thinking related to their everyday lives or longer-term goals, and therefore prioritised activities perceived as more directly beneficial for grades or employability. Participant 3 similarly characterised critical thinking as being treated by some students primarily as a requirement to be completed, with an emphasis on passing assessments rather than engaging deeply with the material. Participant 18 reported avoidance behaviours that they associated with perceived difficulty, including reluctance to move beyond familiar ways of thinking.

To address indifference, teachers may need to make the purpose and transfer value of critical thinking more explicit through course design choices, particularly by clarifying relevance and providing repeated opportunities for practice and feedback. One possible approach is for teachers to explore students' interests and aspirations through tools such as questionnaires, self-introductions, and then tailor teaching content to align with students' lived experiences, professional goals, or contemporary social issues. This alignment may help students better recognise the value and applicability of critical thinking in real-world contexts, in line with

evidence that interventions prompting learners to connect course material to their own lives and goals can strengthen perceived utility value and engagement (Hulleman et al., 2010). In addition, incorporating diverse active learning strategies, such as role-playing exercises and structured debates, may foster deeper engagement and provide sustained practice in constructing and revising reasons (Rodger & Stewart-Lord, 2020).

8.3.2.3 Student mindset barriers

Several teachers described mindset-related barriers that can limit students' uptake of critical thinking instruction and reduce willingness to revise beliefs considering evidence. Some students have long been shaped by a 'memorisation-for-exams' educational model, becoming accustomed to passively receiving 'standard answers' rather than actively questioning and constructing arguments (Participant 10). Such learning habits leave them stuck at the surface level of information reception and hinder deeper analysis, comparison and reflection. Moreover, when classroom evidence directly challenges their pre-existing beliefs, students tend to cling to their original positions, sometimes even avoiding the evidence altogether (Participant 7). This 'fear of being disproved' further suppresses the revision of viewpoints and cognitive growth. Some students also equate 'critical thinking' with merely expressing personal opinions, rather than evaluating claims through evidence and logic (Participant 5). This may reflect the same underlying mindset barriers noted above: a preference for low-risk participation, reluctance to have one's views challenged, and limited willingness to move beyond passive or habitual ways of learning. In group debates, Participant 7 reported that some teams seldom revisited their stance after counterevidence was presented. This reluctance was described less as a reasoned decision based on evaluating the evidence and more as a tendency to prioritise winning the exchange, with limited attention to questions of source credibility, representativeness, or competing explanations. More unambiguously problematic is that some students translate 'critical' literally as 'negative criticism,' interpret peers' questions as provocations, causing tension in discussion (Participant 9).

There are many possible reasons for this challenge. One is that debate itself is inherently competitive and may encourage students to prioritise defending a position rather than

reconsidering their view in light of counterevidence. In this respect, other forms of dialogue may sometimes be more suitable for critical thinking teaching. Walton's account of persuasion dialogue is relevant here, as it places greater emphasis on the exchange and assessment of reasons than on defeating an opponent (Walton, 2006). At the same time, self-image protection also makes it difficult for students to admit 'I was wrong,' triggering confirmation bias and other forms of motivated reasoning. Limited worldly experience and cross-disciplinary knowledge may further reduce the cognitive resources needed to generate diverse perspectives on complex issues (Participant 19). A plausible instructional response is therefore to embed dispositions and constructive dialogue norms within argument analysis tasks, so that changing one's mind is framed as evidentially warranted revision rather than personal defeat. Cultivating dispositions such as open-mindedness, intellectual humility, and a willingness to revise one's beliefs fosters a classroom atmosphere in which changing one's mind is not seen as a weakness but as a sign of intellectual maturity (Facione, 1990; Paul & Elder, 1992). Constructive dialogue further supports this shift by encouraging students to listen attentively, respond respectfully, and treat disagreement as an opportunity for collaborative inquiry rather than personal attack (Brookfield & Preskill, 2012). At the same time, less constructive reactions are likely to arise in classroom discussion, including defensiveness, selective attention to evidence, or resistance to revision. If handled carefully, such moments can themselves become part of the learning process by making poor critical thinking and dialogic habits visible and available for reflection.

8.3.2.4 Some assessments are misaligned with teaching critical thinking

Some participants argue that multiple-choice examinations and essay assessments fail to capture core critical thinking skills such as analysis, evaluation, and synthesis. Final examinations often emphasise rote memorisation and factual recall, with limited capacity to assess higher-order skills. As a result, they may not accurately reflect students' development in critical thinking (Participant 19). Similar concerns arise in the assessment of group work. Although collaborative activities can be valuable for critical thinking teaching, especially when they involve dialogue, peer questioning, and the explicit justification of claims, these strengths do not automatically translate into fair assessment when work is submitted and graded collectively. Because the distribution of labour and reasoning within groups is only

partially visible to teachers, uneven participation may allow some students to contribute minimally to the central intellectual work while receiving the same mark as peers who completed most of the analysis. This limits teachers' ability to attribute outcomes to individual performance and therefore weakens the fairness and transparency of assessing each student's critical thinking development (Participant 16). In addition, Participant 6 suggested that essay writing does not always assess critical thinking effectively, because it can give weaker critical thinkers a structure to follow for passable marks. Such structuring may still be useful in providing writers with organisational support and in making written work easier to teach and assess. However, when students rely too heavily on structure, weaknesses in their actual analytical and evaluative abilities may be obscured.

While participants highlighted limitations in common assessment formats, these practices persist for practical and institutional reasons. Teachers often have to balance validity with feasibility under constraints such as cohort size and time. First, large class sizes and limited instructional resources may compel educators to adopt assessment formats that are easy to administer and grade, such as multiple-choice questions and attendance-based grading. More open-ended tasks such as essay writing can be demanding to mark consistently in large cohorts, particularly where shared rubrics, marker calibration, and moderation are limited. Under these conditions, teachers may be drawn towards assessment formats that appear easier to standardise and scale, even if they capture a narrower range of critical thinking skills (Rust et al., 2005). Moreover, teachers may not always have substantial support or fully developed assessment literacy for designing and evaluating open-ended or performance-based assessments (Koh, 2011; Pastore, 2023). Under such conditions, teachers may revert to more familiar traditional exam formats, even when these are not fully aligned with the goals of critical thinking.

Against this backdrop, the textbook analysis in this study identifies assessment-relevant resources that could be adapted as a possible response. Many of the analysed textbooks embed structured exercises that operationalise critical thinking skills as observable performances, for example the evaluation of short passages, identification of assumptions and judging the credibility of sources. These task types can be repurposed as low-stakes

formative checks or rubric-guided summative assessments that align more closely with analysis, evaluation, and synthesis than factual recall alone. Because they are typically short, repeatable, and anchored in explicit reasoning criteria, they may be more feasible to implement in high-enrolment settings than extended essays, while still supporting feedback and skill development. However, the existence of such resources does not in itself resolve the assessment problem. Adapting textbook exercises for formal assessment still requires time, assessment design expertise, and alignment with teaching requirements, which may help explain why teachers do not adopt them in practice. This may also be related to the fact that not all teachers in the survey used textbooks: seven of the nineteen participants reported not teaching from a textbook, often because they preferred to draw on self-created resources.

At the same time, the challenges of critical thinking assessment should not be overstated. Some commonly used tasks, such as argument reconstruction, short passage evaluation, and credibility judgements, may be relatively feasible to implement and mark at course level. However, the wider validity and reliability of critical thinking assessment remain contested. Meta-analyses indicate that widely used standardised instruments can show unstable validity across disciplinary, cultural, and linguistic contexts, with effect sizes varying markedly (Abrami et al., 2008; O'Leary et al., 2020). Even widely used measures such as the CCTST and Watson-Glaser Critical Thinking Appraisal (WGCTA) have been reported to vary in reliability across contexts (O'Leary et al., 2020). In addition, more complex alternatives, including contextualised tasks, portfolios, or peer assessment, require clear criteria, ongoing guidance, and sustained investments of time, training, and institutional support (Jonsson & Svingby, 2007). The challenge, therefore, is not whether critical thinking can be assessed at all, but how to design approaches that are educationally meaningful, practically manageable, and sufficiently robust for the context in which they are used.

8.3.2.5 Lack of a precise definition of critical thinking

As discussed in Chapter One, definitions of critical thinking range across philosophy, education, psychology and social-critical theory. When teachers attempt to cover all these definitions simultaneously yet fail to design corresponding learning activities and assessment criteria for each, classes can suffer from conceptual conflation and

methodological fragmentation, and students may struggle to transfer their knowledge effectively. Participant 13 emphasised that teachers need to clearly delineate the specific abilities encompassed by critical thinking. Without such clarity, intervention effects are difficult to evaluate. For example, the survey responses suggest that some teachers work with a logic-oriented conception of critical thinking, focused on inferential validity and evidential support, while others appear to invoke broader concerns of normative justification and value-based reasoning. Where the latter occurs, it may reflect an expanded view of critical thinking that includes ethical judgement, although this is not always made explicit. When these orientations are not made explicit, assessment criteria can become mixed, and outcomes are no longer interpretable in relation to a stated learning target. Participant 7 added that, unless basic logic is distinguished from problem solving, creative thinking, or reflective thinking, critical thinking easily devolves into an abstract form of 'mental gymnastics,' leaving teachers across disciplines convinced they are teaching it while, in reality, achieving inconsistent outcomes. Participant 9 likewise observed that if teachers do not explicitly state the definition they adopt at the outset of a course, neither students nor evaluators can accurately judge the learning results.

A potential approach is to begin by identifying the course's core teaching purposes and using argument analysis as the central organising element of the curriculum. As the previous chapters have shown, argument analysis appears to provide the clearest common core across stand-alone critical thinking courses. It therefore offers a practical way of addressing definitional ambiguity: rather than attempting to teach every possible conception of critical thinking at once, teachers can anchor the course in the analysis and evaluation of reasons, claims, evidence, and inference, and then incorporate supplementary elements in line with particular teaching purposes. For instance, if the teaching aim is to improve decision-making, the course may combine argument analysis with probabilistic reasoning; if the emphasis is on communication, it may combine argument analysis with constructive dialogue.

8.3.2.6 Teaching fallacies has no effect

Some participants questioned the value of teaching fallacies, arguing that merely asking students to identify them does little to foster higher-order thinking. Participant 1 observed

that students should practise critical thinking in authentic contexts, rather than deciding simply whether an illustrative example fits a given fallacy category. Participant 12 added that most informal fallacies are either plainly obvious logical defects or otherwise valid arguments that rely on unstated premises. If a course concentrates excessively on these labels, it can encourage low-level 'fallacy hunting' and hinder students' grasp of overall argumentative cogency (Bean & Melzer, 2021, p. 208). This concern is consistent with the Chapter Seven analysis of Hanscomb's (2023) textbook, which argues that reasoning is best assessed in its wider argumentative context rather than as an isolated fragment (pp. 23, 67).

While such critiques are valid concerns about pedagogy, empirical research suggests that well-designed fallacy instruction can indeed enhance critical thinking. For instance, Khartite and Hellalet (2021) found that students trained to spot and avoid informal fallacies significantly outperformed a control group on critical thinking tests. They report the facilitative and positive effect of fallacy training, with trained students better able to detect weaknesses in arguments and avoid reasoning errors. Teachers observed that the trained group deliberately avoided fallacies in their own writing, whereas control students committed more reasoning errors. Fallacy instruction, when systematic and sustained, provides students with a framework to analyse arguments. It encourages them to ask, 'What hidden assumptions are present?' and 'Are the premises acceptable, relevant, and sufficient, and if not, do these limitations fit the pattern of a specific fallacy or weak argument form?' Additionally, Nippold (2024) claims that learning to identify and analyse common fallacies in everyday discourse can strengthen students' ability to detect biased or illogical statements and respond with clearer reasoning.

Drawing on survey participants' responses, course designers can enhance fallacy instruction along two main lines. First, fallacies should never be presented simply as an isolated checklist. As Bean and Melzer (2021, p. 208) note, students often memorise the terminology but struggle to transfer it to authentic contexts. Consequently, they recommend situating fallacies in richly contextualised settings, guiding students to analyse reasoning flaws in everyday conversations, media commentary and public speeches. By selecting contemporary cases that connect closely to students' own experiences, teachers can boost motivation and

give learners regular practice in identifying and correcting fallacies in real discourse. Second, to prevent classes from degenerating into mere 'fallacy hunting,' teachers can adopt Bailin and Battersby's (2015) approach, embedding fallacy recognition within the broader process of argument evaluation. Students are encouraged to reconstruct and compare competing positions, treating the identification of fallacy-like moves as one step within a broader evaluation of argumentative strength. This orientation aligns with a major development in argument theory over recent decades, namely the shift from treating many so-called informal fallacies as an all-or-nothing error to analysing them as common argument forms or argument schemes whose cogency varies by context and by how well they respond to 'critical questions'. Moves such as ad hominem, slippery slope, and appeals to authority are not automatically weak or erroneous. They may be reasonable in some circumstances and defective in others, depending on whether they satisfy criteria such as acceptability, relevance, and sufficiency, or scheme-specific 'critical questions' (Walton, 1996). By asking students to assess these moves as stronger or weaker instantiations of familiar schemes, rather than merely labelling them, this approach both strengthens their ability to diagnose problematic reasoning and reduces the incentive for superficial fallacy hunting (Hanscomb, 2023, pp. 121-123).

8.4 Chapter summary

This chapter presents a thematic analysis of an online teacher survey designed to capture practice-based accounts of critical thinking teaching in Western higher education. Twenty-eight responses were received, of which nineteen were valid responses from participants who reported having taught a critical thinking course. The data were analysed using abductive thematic analysis following Braun and Clarke's (2006) procedure, and responses were coded using the same purpose, content, and method framework used in the scoping review and in the syllabus and textbook chapters. Themes are reported using the same frequency tiers as earlier chapters, while interpreting threshold boundaries cautiously given the sample size.

Across the three analytical dimensions, the survey results are broadly consistent with the earlier syllabus and textbook analyses in what they foreground most clearly. In particular, teachers most often frame critical thinking in terms of analytical development and argument

focused instruction. Develop Analytical Skills and Argument analysis are each reported by 17 of 19 participants (89%), which is compatible with the central position of argument work in the datasets. Active Learning is also commonly mentioned (12 of 19, 63%), which aligns with the emphasis on practice tasks and applied exercises visible in textbooks and frequently stated in syllabuses. In this respect, the survey provides practice-based support for the view that argument centred skill development functions as a common instructional route in critical thinking teaching across the evidence sources used in this thesis.

At the same time, the survey differs in what it makes visible. Compared with syllabuses and especially with textbooks, teachers' brief descriptions report fewer secondary purposes, content strands, and method labels. For example, several themes that are explicit in textbook chapter structures and in syllabus lists appear less often as stand-alone items in survey responses, including Fallacies, Foundations and Importance of Critical Thinking, and a range of method formats beyond Active Learning. One plausible explanation is that survey responses tend to compress course descriptions into a small number of headline points, and teachers may treat foundational framing, definitions, and fallacy related work as integrated within argument analysis rather than as separate topics worth naming.

A contribution of the survey is that it makes more visible the classroom-level significance of a number of practice-related themes. Some of these issues are discussed in the wider literature, but they were not clearly visible as stable themes in the syllabus and textbook datasets and become more concrete when seen through teachers' reported experience. In addition to the review-derived framework, teachers' responses to the survey questions also highlighted issues concerning teaching and learning conditions rather than curricular topics. Several relate to student engagement and readiness, such as student indifference, mindset barriers, anxiety, and perceived difficulty of content. Others concern course design and pedagogy, including the use of Flipped Classroom approaches and the value of adopting a Humble Teacher Stance to support inquiry-oriented classroom norms. A further set of responses highlight tensions between intended critical thinking learning and assessment practices, including concerns that some common assessment formats may reward recall, speed, or compliance more than analysis and evaluation. Conceptual concerns are also

visible, particularly the lack of a shared definition of critical thinking and doubts about the effectiveness of fallacy instruction when it becomes detached from contextualised argument evaluation. Although many of these themes are expressed in abbreviated form, together they suggest that teachers experience critical thinking instruction as shaped not only by what critical thinking content is selected, but also by student motivation, cognitive demand, and assessment constraints that influence what can be taught and how learning can be evidenced.

The chapter has limitations that should be considered when interpreting its findings. First, the sample is small and based on voluntary participation, so the results cannot be treated as representative of critical thinking teaching across Western higher education. Second, the responses are self-reported and often brief, which may reduce the visibility of themes that are taught but not explicitly named by participants. Finally, the coding strategy records themes in presence or absence form, which captures whether a theme is mentioned but cannot indicate the relative emphasis, time allocation, or depth of treatment in teaching practice.

Building on this practice-based evidence, the next chapter shifts the focus from Western teaching practice to the Chinese higher education context through a policy analysis. It examines how critical thinking related aims are framed within Chinese national education policy, and considers the policy demands, constraints, and institutional priorities that might shape the curriculum space for critical thinking. This provides contextual grounds for assessing which teaching elements identified in the earlier chapters may be feasible and educationally meaningful when offering recommendations for critical thinking learning and teaching in Chinese universities.

Chapter Nine: A scoping review of Chinese national education policies related to critical thinking

9.1 Introduction

9.1.1 Objectives and rationale

This chapter examines Chinese education policy documents in order to clarify the national priorities and challenges they foreground, and to consider how critical thinking instruction may be positioned in relation to the broader strategic aims reflected in those priorities, such as strengthening innovation capacity and improving educational quality. I reviewed how the policies describe the purposes of education, the abilities students are expected to develop, and the practical challenges the system is expected to address. On this basis, the chapter clarifies the reasons why particular teaching priorities are relevant to the needs stated in policy. I conducted a scoping review following the PRISMA-ScR framework (Tricco et al., 2018). Drawing on this scoping review, the chapter examines the evolution of Chinese education policy over the past two decades and analyses how various elements of critical thinking teaching align with the priorities outlined in national policy. The findings from this analysis clarify the policy priorities and institutional constraints that inform Chapter Ten's framework for critical thinking course design in Chinese higher education. Further methodological details are provided in Chapter Two.

It is also important to clarify the distinction between critical thinking developed through disciplinary teaching and critical thinking taught through a stand-alone course. In Chinese policy discourse, references to critical thinking are most often embedded within broader agendas for pedagogical improvement, inquiry-based learning, curriculum reform, and research-led education. In this embedded sense, critical thinking is expected to emerge through the way disciplines are taught rather than through a separately specified curriculum component. However, this thesis focuses on stand-alone critical thinking courses as an institutional complement to embedded approaches. A stand-alone course can provide a more clearly defined curricular space for structured and assessable practice in reasoning and argument analysis, while also offering a potentially transferable foundation that disciplinary

courses may later extend in more context-specific ways. For this reason, while the present chapter analyses policy priorities largely articulated in embedded terms, it does so to identify the needs and constraints that a stand-alone course design must align with and respond to.

The full list of the thirty-one policy documents included in this review is provided in the Appendix H1, together with their titles, publication details, issuing organisations, and brief content summaries. These documents are national-level education policies that set priorities, targets, and implementation requirements across different parts of China's education system, ranging from compulsory schooling to higher education and teacher development. They include major strategic plans (e.g., the 'Outline of the National Medium- and Long-Term Education Reform and Development Plan (2010-2020)' and 'China Education Modernization 2035'), which articulate long-term national goals and the capabilities students are expected to develop; system-wide reform directives (e.g., the 'Overall Plan for Deepening Educational Evaluation Reform in the New Era'), which respond to concerns about assessment practices and teaching quality; and sector- or programme-focused policies (e.g., the 'Implementation Opinions on Deepening the Reform of Innovation and Entrepreneurship Education in Higher Education Institutions' and the 'Overall Plan for Promoting the Construction of World-Class Universities and Disciplines'), which aim to strengthen higher education outcomes and national competitiveness. The set also includes policies directed at specific areas of schooling and implementation, such as curriculum reform in basic education, vocational education reform, and education digitalisation (e.g., 'Education Informatization 2.0 Action Plan'). These documents form a coordinated set of national directives that guide what education should achieve and how reforms should be carried out.

9.1.2 Background

To better understand Chinese education policy, it is necessary to briefly outline the educational context. The discussion that follows concentrates on two challenges that are most directly tied to policy expectations about thinking skills and knowledge production: the rigidity of talent cultivation models and the limited capacity for research innovation.

First, Chinese universities have traditionally relied on teacher-centred and exam-oriented instructional models (Zhong, 2006). These models emphasise memorisation and knowledge reproduction, rather than active inquiry, analytical reasoning, or independent judgement. In most classroom settings, teachers deliver content in a one-way manner while students passively absorb the material (Zhang & Koshmanova, 2021). Opportunities for discussion, questioning, or critical engagement are limited. Expressing disagreement with textbook content or the teacher's views is often discouraged and may even be seen as inappropriate. Such a learning environment restricts the development of key critical thinking dispositions, including curiosity and open-mindedness. It may also weaken analyticity and critical thinking self-confidence (Facione, 1990). Although national policies in recent years have encouraged student-centred and inquiry-based learning, the actual implementation of these reforms remains limited in scope and inconsistent across institutions (Li & Xue, 2023). This is particularly the case in non-elite universities. As a result, many graduates, despite achieving high examination scores, are often seen as lacking the ability to think independently or to apply knowledge to real-world problems. This phenomenon is widely described in China as 'high scores but low competence' (高分低能; Han, 2022).

Second, the limited capacity for research innovation in Chinese higher education is closely linked to the strong emphasis on research metrics rather than the cultivation of critical and creative thinking. In many institutions, academic performance is assessed through quantitative indicators such as publication counts, journal rankings, and citation indexes (Guan & Meng, 2007). Under such conditions, staff time and attention are directed towards producing papers that satisfy these criteria, which can incentivise incremental projects and discourage longer-term or higher-risk inquiry that might not generate quick publications (Wu & Liu, 2021).

This incentive structure can also reduce the time and effort invested in teaching that develops students' critical thinking. In some institutions, staff seek reduced teaching loads or place greater emphasis on research tasks in order to meet appraisal and promotion requirements that weight research outputs heavily. Even when teaching responsibilities remain, staff may rely on lecture-based delivery because more student-centred approaches require substantial

preparation, small-group facilitation, and detailed feedback, all of which are difficult to sustain under tight time pressures and large classes. In addition, when research-led teaching is promoted, teaching can become closely tied to the teacher's own research agenda. Without careful pedagogical design, research-led teaching is prone to being delivered in a transmission style, because research is communicated through formats such as conference presentations and journal articles that prioritise reporting findings efficiently to an expert audience rather than scaffolding novices' practice (Healey, 2005). By contrast, some systems explicitly recognise teaching-focused academic tracks, which can protect time for pedagogy (In some UK universities, where some academic roles are organised around a Learning, Teaching & Scholarship track). As a result, the development of students' analytical abilities and the integration of critical inquiry into academic culture can be weakened. Over time, this contributes to a research environment that rewards conformity and short-term productivity, while providing fewer incentives for the intellectual risk-taking and openness that are often necessary for genuine innovation.

These two challenges suggest that strengthening critical thinking instruction is not only pedagogically valuable but also necessary at an institutional level. In contexts where teaching remains highly teacher-centred and where research success is strongly tied to measurable output targets, improvements cannot rely solely on individual teachers' goodwill or isolated classroom innovations. Attention to critical thinking is needed because it supports the kinds of learning and academic work that current structures often discourage, including questioning and reason-giving.

9.2 Findings

In this section, the chapter explains five core demands from contemporary Chinese national education policy that are related to critical thinking. Through coding the policy texts, the chapter identified policy orientations related to 'cultivating innovative talents,' 'cultivating critical thinking,' 'optimising teaching methods,' 'enhancing research capacity,' and 'restoring teaching to its core.' These labels are developed through the thematic analysis framework following Braun and Clarke (2023). The coding approach is described in the methodology chapter, and the coding process and results are documented in the Appendix

H2. In the following discussion, I analyse each theme, illustrate it with examples from the policy texts, and consider its implications for the design and implementation of stand-alone critical thinking courses in Chinese higher education.

9.2.1 Cultivating innovative talents

Out of the 31 Chinese policy documents reviewed, 23 explicitly emphasise the need to cultivate innovative talents. This refers to the development of high-quality individuals through education who possess creative abilities and a spirit of practical exploration, in order to support sustainable socio-economic development and enhance global competitiveness. The reason China places such urgency on the cultivation of innovative qualities is closely linked to its current stage of development and strategic objectives. First, China's economy is undergoing a transformation 'from high-speed growth to high-quality development' (从高速增长转向高质量发展). The traditional model, which relied on resource-intensive and labour-intensive industries, is no longer sustainable (Li & Li, 2023). There is an urgent need to shift towards growth driven by technological, managerial, and industrial innovation. Secondly, as global technological competition intensifies, the core of national competitiveness is increasingly centred on the innovation capacities of individuals and the production of independent, original achievements (Wei et al., 2017). China therefore urgently requires a large pool of individuals with original thinking and an innovative spirit to secure its position in the global economic and technological landscape.

As a result, the cultivation of innovative talents has become a strategic consensus and a pressing imperative within China's education policy. Policy documents such as 'Chinese Education Modernization 2035' explicitly call for '*enhancing the cultivation of innovative talents, particularly top-tier innovative individuals, and increasing the proportion of application-oriented, interdisciplinary, and technically skilled talents*' (Central Committee of the Communist Party of China & State Council, 2019b, p. 25), indicating that innovative competence is treated as a key criterion for evaluating educational outcomes. Additionally, 'Opinions on Deepening the Reform of the Education System and Mechanism' stresses the need to '*stimulate students' curiosity, imagination and innovative thinking, and encourage them to explore boldly, take initiative, and create.*' This demonstrates that the cultivation of

innovative people is not merely about mastering professional knowledge and skills, but also about nurturing students' modes of thinking, dispositions, and the ability to engage in exploratory practice (General Office of the Communist Party of China & General Office of the State Council, 2017).

There is a close connection between critical thinking education and students' potential for innovation. In Western discussions of higher education, critical thinking is often presented not only as argument evaluation but also as a foundation for creative Problem Solving and the generation of new ideas (Halpern, 2013). From this perspective, innovation requires more than producing novel ideas. It also requires disciplined judgement, including the ability to question assumptions, test explanations against evidence, compare alternatives, and refine ideas in response to criticism (Paul & Elder, 2019). In this sense, critical thinking can be understood as a quality-control and improvement mechanism within creative work. It supports innovation by helping learners select among competing possibilities, justify choices with reasons, detect weaknesses in initial proposals, and iteratively revise ideas rather than treating novelty as sufficient.

At the same time, empirical studies that examine critical thinking and creative thinking as related forms of higher-order cognition typically report a positive association between the two, although the strength of the relationship varies across measures and contexts (Dwyer, 2023). This pattern is consistent with the view that critical thinking can enhance the evaluation and refinement phases of creative thinking. However, it also allows an alternative interpretation that is important to acknowledge for causal clarity. In many educational settings, a third factor, such as the design of inquiry-based learning experiences or research training, may strengthen both critical thinking and creativity by increasing students' exposure to open problems, evidential reasoning, and feedback-driven revision. Evidence from student learning contexts aligns with this possibility. For example, research on undergraduate learning indicates that greater research experience is associated with gains in both critical thinking and creativity, highlighting the role of inquiry-based practice in developing these capabilities (Park et al., 2021). For the purposes of this chapter, the primary claim is therefore not a simple causal assertion that critical thinking instruction automatically

produces creativity, but that the forms of judgement trained in critical thinking are directly relevant to innovation as policy describes it, and that well-designed inquiry environments can provide conditions under which both critical thinking and creative capacities are more likely to develop (Halpern, 2013; Paul & Elder, 2019; Park et al., 2021).

9.2.2 Cultivating critical thinking

Out of the 31 Chinese policy documents reviewed, 5 explicitly and 14 implicitly express the need to cultivate critical thinking. Although the term 'critical thinking' is rarely used directly in Chinese education policy documents, a number of these texts emphasise related capabilities, particularly independent thinking, logical reasoning, information analysis, and problem-solving. For example, 'Opinions on Deepening the Reform of the Education System and Mechanism' explicitly calls for '*cultivating cognitive abilities, guiding students to develop qualities such as independent thinking, logical reasoning, information processing, learning to learn, oral expression, and written communication, and fostering an awareness and ability for lifelong learning'* (General Office of the Communist Party of China & General Office of the State Council, 2017). '13th Five-Year Plan for the Development of National Education' also highlights the importance of '*strengthening training in scientific methods and gradually cultivating students' abilities in logical and dialectical thinking.'* (State Council, 2017) In addition, 'Implementation Opinions of the Ministry of Education on the Construction of First-Class Undergraduate Courses' states that course objectives should focus on '*cultivating students' abilities for in-depth analysis, courageous questioning, and creative thinking.'* (Ministry of Education, 2019) These capabilities are closely related to critical thinking, but they are not simply different names for the same thing. Critical thinking centres on analysing and evaluating arguments and on deciding whether conclusions are adequately supported (Bassham et al., 2011; Facione, 1990). Independent thinking concerns reaching one's own judgement, which may still be poorly supported, while logical reasoning, information analysis, and problem-solving draw attention to particular aspects or applications of reasoning rather than the broader evaluation of arguments.

The connection lies in what critical thinking can contribute to these capabilities. By learning to identify and evaluate reasons, evidence, and assumptions in natural-language arguments,

students may become better able to judge for themselves, examine how claims are supported, assess the relevance and credibility of information, and compare possible solutions (Bassham et al., 2011; Facione, 1990). The policy emphasis on independent thinking and related reasoning capacities therefore provides a context in which critical thinking teaching may be relevant, even where policy documents do not explicitly demand critical thinking itself.

China's urgent need to cultivate students' critical thinking is closely linked to its current development strategies. On the one hand, with the rapid advancement of globalisation and the information society, the volume of information has surged while its quality varies greatly. Individuals therefore need stronger critical thinking skills to evaluate information and the reasons offered for it, rather than accepting claims on the basis of (apparent) authority, popularity, or selective evidence. This includes recognising common patterns of weak reasoning, for example appeals to authority, overgeneralisation from limited cases, and misleading causal claims, which are especially common in fast-moving online environments. The 'Education Informatization 2.0 Action Plan' clearly states the need to *'promote a shift from technology application to the development of competence and literacy,'* emphasising that students need to acquire sound information literacy and the ability to use information to solve problems (Ministry of Education, 2018). Teaching critical thinking can help meet this need.

The complex challenges facing China's socio-economic development require university students not only to absorb and apply knowledge, but also to make well-justified judgements in conditions of uncertainty. This includes weighing competing evidence, recognising trade-offs, and explaining decisions clearly in public contexts. The 'Implementation Opinions of the General Office of the State Council on Deepening the Reform of Innovation and Entrepreneurship Education in Higher Education Institutions' explicitly call for '*cultivating students' critical and creative thinking,'* highlighting the essential role of critical thinking in fostering innovation, entrepreneurship, and Problem Solving (State Council, 2015a). As such, cultivating critical thinking represents a key strategy in responding to China's demand for high-quality talent.

At the same time, recent Chinese education policies have been consistently promoting a transformation in educational philosophy, gradually shifting from an exam-oriented approach to one focused on quality-oriented education (Xue & Li, 2023). Within this context, critical thinking instruction shows a high degree of alignment with policy demands. Suzhi education (素质教育; quality-oriented education), which has been a core reform direction since the 1990s, emphasises the all-round development of students in moral, intellectual, physical, aesthetic, and practical domains (Pang et al., 2020). It goes beyond knowledge acquisition to focus on the cultivation of abilities, emotions, values, and a sense of social responsibility. The 'Opinions of the State Council on Further Promoting the Balanced Development of Compulsory Education' clearly state the need to '*establish a scientific view of educational quality, guided by Suzhi education, to promote students' all-round development in morality, intelligence, physique, aesthetics, and active, self-motivated learning.'* (State Council, 2012a) The '12th Five-Year Plan for the Development of National Education' further notes that quality education should '*promote the comprehensive development of the individual and respond to the needs of society'* as the fundamental criterion for evaluating educational quality (State Council, 2012c). In line with this shift, critical thinking teaching provides a model that supports the transition from exam-based to quality-oriented education. Specifically, many core competencies emphasised in policy, such as communication, Problem Solving and social responsibility can be addressed through critical thinking teaching. For instance, the 'Overall Plan for Promoting the Construction of World-Class Universities and Disciplines' stresses the importance of '*cultivating a sense of social responsibility and ethical awareness,'* which can be developed through critical thinking instruction that includes training in ethical reasoning and value judgements (State Council, 2015c). Therefore, teaching critical thinking not only adapts to Suzhi education in terms of its teaching purposes (e.g., cultivating students' critical thinking dispositions), but also highly responds to Suzhi education in terms of its teaching content (argument analysis, emotions, and value judgements).

9.2.3 Optimising teaching methods

Among the 31 policy documents reviewed, 18 highlight the need to optimise teaching methods. In these documents, optimising teaching methods refers to a shift away from the

traditional teacher-centred, passive learning model toward more diverse, interactive, and student-centred pedagogical practices. This transformation signifies the incorporation of inquiry-based, participatory, interactive, and collaborative teaching approaches that aim to fully stimulate students' enthusiasm, initiative, and creativity in learning. For example, 'China Education Modernization 2035' explicitly calls for the promotion of '*inquiry-based, participatory, and collaborative teaching methods,'* indicating a move toward more engaging pedagogies (Central Committee of the Communist Party of China & State Council, 2019b). Meanwhile, 'Implementation Opinions of the Ministry of Education on the Construction of First-Class Undergraduate Courses' stress the importance of '*innovative classroom design and enhanced teacher-student and student-student interaction, eliminating teacher monologues and passive student reception,'* underscoring the emphasis on active learning environments in higher education (Ministry of Education, 2019). These reforms in teaching methods in Chinese education policy reflect a fundamental shift from passive learning to active learning, enabling students to engage more deeply and proactively in the exploration and understanding of knowledge.

As demonstrated in earlier chapters through analysis of course syllabuses, textbooks, and teacher surveys, active learning is consistently prominent across the earlier datasets (e.g., it is standard in textbooks, and frequent in syllabuses and teacher reports). Its primary objective is to guide students to engage in argument analysis, inquiry, and open-minded exploration of issues. This teaching method goes beyond the unidirectional transmission of knowledge and instead encourages students to ask questions, challenge assumptions, and independently evaluate evidence and conclusions. Such an approach closely aligns with the active learning strategies explicitly advocated in Chinese education policy. For instance, the 'Opinions on Deepening Educational and Teaching Reform to Fully Improve the Quality of Compulsory Education' states that teachers should '*guide students to think actively, ask questions, and explore independently.'* (Central Committee of the Communist Party of China & State Council, 2019c) The 'Opinions of the Ministry of Education on Improving and Strengthening Graduate Course Construction' emphasise that students should '*gain a better understanding of the innovation process through case-based teaching that fosters independent exploration and deep thinking.'* (Ministry of Education, 2014) Similarly, the

'Notice of the General Office of the Ministry of Education on Recommending Experimental Zones and Schools for Teaching Reform in Compulsory Education' calls for the active exploration of '*context-based, problem-oriented, interactive, inquiry-based, and experiential teaching methods,'* which are common critical thinking teaching methods (Ministry of Education, 2023). Critical thinking teaching that adopts case studies and other forms of contextualised arguments can encourage active student engagement, enabling more meaningful and in-depth analysis and evaluation of arguments and decision-making. Furthermore, policy documents also emphasise that teaching methods should support differentiated instruction and individualised development (Kashin & Yankova, 2022). Critical thinking instruction values each student's independent viewpoint, encouraging personalised expression and reasoning from multiple perspectives (Facione & Facione, 2013; Franco et al., 2018). In terms of teaching methods, the evidence reported in earlier chapters shows that critical thinking is typically taught through structured active-learning practices rather than extended lecture alone. The textbook analysis indicates that many textbooks rely on guided exercises, for example reconstructing arguments, identifying assumptions, and evaluating arguments using short passages and case-based scenarios (Bassham et al., 2011; Facione & Facione, 2013; Halpern, 2013; Sinnott-Armstrong & Fogelin, 2005).

9.2.4 Restoring teaching to the core of higher education practice

Among the 31 Chinese education policy documents reviewed, 12 explicitly refer to the need to restore teaching to its core position. The concept of restoring teaching to the core refers to reaffirming the central role of teaching in the development of higher education, particularly by emphasising the importance of classroom teaching quality. This policy trend clearly calls on university faculty to devote greater attention to teaching rather than focusing solely on research, and to regard the quality of student development as the fundamental benchmark for institutional progress. As noted in the background section, many university lecturers in China have traditionally prioritised research publications over teaching. In response to this issue, the 'Opinions of the State Council on Strengthening the Construction of the Teaching Force' stress that universities must '*improve teacher evaluation systems centred on teaching performance, and use professors' engagement in undergraduate teaching as a key criterion in assessment'* (State Council, 2012b). Similarly, the 'Outline of

the National Medium- and Long-Term Education Reform and Development Plan (2010-2020)' clearly states that '*teaching should be the primary component of faculty evaluation, and professors in particular should be required to teach lower-year undergraduate students.'* (State Council, 2010a) This policy trend reflects the increasing emphasis within Chinese higher education on improving the quality of classroom teaching. It also signals a broader transformation from valuing research output alone to focusing on the quality of student learning. The return of teaching to the core of higher education highlights a renewed recognition of the central importance of fostering students' development rather than measuring success purely by the number of academic publications.

Critical thinking teaching can contribute to this policy orientation by prioritising demonstrable learning through practice, feedback, and skill development rather than treating knowledge acquisition as the sole outcome. It focuses not on the superficial accumulation of knowledge, but on cultivating students' academic and other skills and dispositions. Through elements such as argument analysis, constructive dialogue, the identification of biases and heuristics, critical thinking instruction equips students with a cognitive toolkit that benefits them throughout their lives. This is consistent with the goal of fundamentally improving the quality of student preparation as set out in the 'restoring teaching to the core of higher education' theme.

9.2.5 Enhancing university research capacity

Among the 31 Chinese education policy documents reviewed, 12 explicitly refer to the need to strengthen research capacity in higher education institutions. Enhancing university research capacity refers to promoting both basic and applied research within universities, with an emphasis on the deep integration of research and teaching to fulfil the dual function of fostering academic innovation and contributing to societal development. For example, 'China Education Modernization 2035' proposes to 'establish a number of world-class national science and technology innovation platforms, strengthen research, and comprehensively enhance the original innovation capacity of higher education institutions.' (Central Committee of the Communist Party of China & State Council, 2019b) Additionally, the 'Measures for the Implementation of Promoting World-Class Universities and

Disciplines Construction (Provisional)' stresses that universities should be oriented towards major national needs and 'enhance the level of basic research, strive to keep pace with or lead international academic frontiers, and prioritise the development of interdisciplinary and collaborative innovation through new models of research organisation.' (Ministry of Education, Ministry of Finance, & National Development and Reform Commission, 2017) Thus, in policy terms, strengthening university research capacity includes integrating research and teaching, supporting interdisciplinary and collaborative research, and reforming research organisation and governance. These measures are framed as ways to meet national strategic priorities and, at the same time, to advance international standing and influence in research and innovation.

Strengthening the teaching of critical thinking may offer limited and indirect support for certain student-level capacities that are relevant to later research practice, particularly judgement, evidence appraisal, and problem formulation. As previously discussed, some scholars and policy-oriented accounts treat critical thinking instruction as relevant to cultivating innovative individuals. Beyond talent development, a number of authors suggest that elements of critical thinking overlap with skills and dispositions that are pertinent to research practice, although the strength and scope of this contribution remain context-dependent and should be stated with clear limits. First, critical thinking's emphasis on argument analysis and evidence evaluation has been argued to support students in developing greater logical clarity and methodological awareness when they learn to justify research choices and present claims in academic writing (Green, 2015; Raj et al., 2022). Second, research on information literacy and critical thinking indicates that these capacities can strengthen researchers' ability to appraise the quality of literature and the plausibility of theoretical frameworks, potentially improving the precision of literature reviews and early-stage problem formulation (Enciso et al., 2017; Facione, 2011). In addition, work on fallacies and cognitive biases suggests that targeted training may help novice researchers become more reflective about assumptions, intuitions, and motivated reasoning in inquiry, thereby potentially reducing avoidable errors in judgement and encouraging greater epistemic caution when interpreting evidence (Dumitru & Halpern, 2023; Halpern, 2013).

However, it is also necessary to acknowledge an important limitation that bears directly on this theme. McPeck argues that critical thinking is substantially domain-specific and that general instruction in critical thinking, when detached from disciplinary knowledge and subject-specific standards of evidence, has limited and uncertain transfer to other fields (McPeck, 2016). From this perspective, many of the capabilities that constitute research capacity in policy terms, such as research design competence, methodological mastery, and field-appropriate inference, are primarily developed through disciplinary training, apprenticeship, and sustained practice within particular research communities, rather than through simply a stand-alone critical thinking course. This caution is especially relevant here because policy priorities about research capacity also include institutional and organisational dimensions, such as research platforms, governance, evaluation regimes, and cross-disciplinary collaboration, which extend beyond what a critical thinking curriculum can directly deliver.

In this light, the most defensible claim is that critical thinking instruction can offer conditional and complementary support to the research agenda identified in policy, rather than serving as a primary lever for strengthening research capacity. It may help students translate broad policy priorities into clearer, researchable questions by strengthening argument analysis (State Council, 2010a). Critical thinking frameworks also characterise critical thinking as reasoning used in decision making (Facione, 1990, p. 2; Halpern, 2013, p. 4), and research using real-world outcome measures reports that stronger critical thinking is associated with better functioning in everyday domains that depend on decision making (Butler et al., 2012). Nevertheless, these contributions are best understood as supporting conditions that can enhance how students approach inquiry, while substantive improvements in university research capacity will still depend chiefly on disciplinary research training and wider institutional reforms, with stand-alone critical thinking courses functioning as a supplementary component within that broader strategy (McPeck, 2016).

9.3 Discussion

9.3.1 Balancing innovation and critical thinking

In reviewing Chinese national education policies, a clear pattern emerges whereby

innovation is given explicit and priority attention, but critical thinking is often only implied or secondary. This disparity is evident in both the language of policy documents and the concrete support measures attached to each goal. Chinese education policies overwhelmingly prioritise the cultivation of 'innovative talent.' Among 31 policy documents reviewed, 23 explicitly call for developing innovative talent and outline concrete measures to achieve this goal (e.g. special funds, new programs, incubators). This reflects a national strategy to drive economic growth via innovation: in order to build an 'innovative economy,' China has invested heavily in STEM education and university research initiatives (Loyalka et al., 2021). Policies such as major funding schemes, 'Double First Class' university plans, and entrepreneurship programs all emphasise innovation capacity as a key outcome. It is noteworthy that as these policies are implemented, they establish supportive mechanisms like dedicated innovation funds, innovation hubs and labs on campuses, revised evaluation criteria to reward patents/start-ups, and industry partnerships to commercialise research (Han et al., 2023; Liu et al., 2019b). This has created a policy infrastructure for innovation, sending strong signals to institutions and educators that innovation outcomes are paramount.

In contrast, critical thinking receives far less explicit emphasis in Chinese national education policy. Of the same 31 documents, only 5 explicitly mention the term 'critical thinking.' An additional 14 documents imply its importance through phrases like 'independent thinking,' 'logical reasoning,' or 'analytical ability,' but these references are scattered and not framed as primary objectives. Unlike innovation, critical thinking is usually treated as a sub-component of broader educational aims (e.g. general quality improvement or scientific literacy) rather than a stand-alone focus. There is no dedicated policy initiative or funding program solely for critical thinking comparable to those for innovation. In practice, this means critical thinking often hides behind other goals. For example, a policy might encourage improving teaching quality or research level, within which one could argue critical thinking is helpful, but it is not spotlighted. The lack of distinct policy framing signals that cultivating critical thinking skills is not yet a policy end in itself. Critical thinking remains an implicit demand, valued in principle, but under-articulated and under-supported in policy specifics.

It is important to clarify the relationship between critical thinking and innovation, as well as how they differ in focus. Psychologist Robert Sternberg, for instance, categorises intelligence into analytical (critical), creative, and practical components, arguing that high achievement requires all three in concert (Sternberg, 2018). A creative idea without analytical rigor may be original but not useful, while analysis without creativity may never yield new breakthroughs. By encouraging students to evaluate evidence and think sceptically, critical thinking feeds the inventive process (e.g. identifying genuine problems worth solving, anticipating flaws in a design). In this sense, critical thinking can be understood as supporting some of the judgement-related conditions associated with innovation.

However, despite this synergy, the two concepts differ in their educational objectives and pathways. In policy terms, innovation is linked to new technologies, products, or research breakthroughs. Cultivating innovation often involves patent applications, entrepreneurship training and industry collaboration. The success is measured by outputs and impact on economic development. Critical thinking is process oriented. It emphasises analysing arguments, evaluating evidence and reflective judgement. The focus is on how students approach questions and problems, not necessarily on producing a specific innovation immediately. Critical thinking cultivation happens through discussion, debate, writing analytic essays, all of which encourage engaging with multiple perspectives. Its outcomes are often seen in improved reasoning and decision-making quality, which are harder to quantify, especially in the short term. Both are vital and in fact complementary.

From a teaching perspective, critical thinking can support the judgement-related conditions for meaningful innovation. In the taxonomy of learning objectives, critical thinking skills such as analysis and evaluation are treated as foundational to creation and innovation (Anderson & Krathwohl, 2001). The implication is that students are more likely to reach creative outcomes after they have learned to analyse and evaluate existing knowledge. High-quality novel ideas emerge when students are equipped to question prevailing assumptions and think for themselves. China's innovation drive could therefore be even more effective if accompanied by an equally strong emphasis on critical thinking skills and dispositions, including the capacity for constructive dialogue and group decision-making. Critical

thinking does not only train students to analyse and evaluate ideas individually; it also develops habits needed for reasoned exchange and collective judgement, such as listening charitably, asking probing questions, offering well-grounded criticism, weighing alternative proposals, and revising one's view in response to counterarguments (Hanscomb, 2023, p. 91; Walton, 2006, p. 173; Aikin & Clanton, 2010). Many forms of meaningful innovation emerge through this kind of disciplined interaction, in which ideas are tested, refined, combined, and sometimes selected through shared deliberation. This emphasis also resonates with policy language that values dialectical thinking, because dialectical reasoning requires students to examine tensions, compare alternatives, and arrive at more justified individual and collective judgements rather than accepting a single viewpoint too quickly.

Although critical thinking has not been explicitly emphasised, it has been indirectly affirmed in various policy expressions (such as quality-oriented education). This implicit emphasis can be considered from two aspects. First, there is latent policy interest and positive rhetoric that can be built upon. Second, it highlights a gap that future policy can address, by making the implicit explicit. To truly get the benefits, critical thinking needs to become an unambiguous focus at the policy level, not just an implicit expression. This means crafting policies that name critical thinking outright as an educational goal, and that also specify what is meant by critical thinking in this context. In particular, policies should clarify which elements are prioritised and why, for example reasoned judgement based on evidence, the ability to analyse and evaluate arguments, constructive dialogue in which students can question and justify claims, and dispositions such as curiosity and open-mindedness. Setting out these elements would reduce ambiguity, support consistent implementation across institutions, and make it possible to design curricula, teacher training, and assessment approaches that match the intended outcomes. For instance, policy could introduce critical thinking development programs, integrate critical thinking benchmarks in university accreditation and ranking systems, or incorporate critical thinking into the criteria for government funding allocation to universities. Such clarity and commitment would align educational practices with the aspiration to improve students' critical thinking. Ultimately, elevating critical thinking through formal policy channels is likely to strengthen Chinese higher education by producing graduates who can form evidence-based judgements,

evaluate arguments, and engage in constructive dialogues that support collective problem solving and effective decision making.

9.3.2 Policy advocacy vs classroom reality

Chinese education policy documents from 2001 to 2024 have repeatedly championed inquiry-based and student-centred teaching, with creativity and innovation as explicit aims. Critical thinking is seldom named directly, but is implied through repeated references to independent thinking, questioning, and reasoning skills. However, a gap between policy and practice persists. Many 'non-elite' universities (those outside the Double First-Class initiative) continue to rely on lecture-dominated instruction, with teachers as the authoritative knowledge transmitters and students as passive note-takers (Zhao, 2013; Tan, 2016; Lin, 2022). Several factors contribute to this gap. Culturally, the legacy of Confucian education, which emphasises respect for authority (Ho et al., 2001), rote learning, and a hierarchical teacher-student relationship, does not easily align with inquiry-based pedagogy (Lin, 2022). At the institutional level, large class sizes make interactive teaching methods difficult to implement. Many faculty members themselves were educated within lecture-based systems and may feel unprepared or unconvinced about adopting more dialogic approaches (Zhao, 2013; Tan, 2016). As a result, although 18 policy documents over the past two decades have promoted inquiry-based and student-centred reforms, implementation has remained uneven across institutions and has not produced a consistent shift in everyday classroom practice.

In theory, the introduction of critical thinking courses focused on active learning may contribute to achieving broader teaching changes (Kusumoto, 2018; Walker, 2003). When students experience the benefits of debate and inquiry, they may become more active learners in all courses, and teachers may see an increase in engagement (Walker, 2003). However, to achieve this, teachers need to be trained and receive resource support to adopt active learning techniques throughout the curriculum. Notably, some success cases in China highlight what it takes to make active learning of critical thinking work. The analysis of the Chinese syllabus in Chapter Six reveals that Elite universities like Tsinghua have incorporated courses such as '*Critical Thinking and Moral Reasoning'* into their general education requirements, with

the intention of deliberately challenging students' assumptions through open debate and independent reflection. And a non-Double First-Class initiative like Shantou University became a pioneer by making a critical thinking course compulsory for all first-year undergraduates in 2011 (Dong, 2015). Shantou's program introduced large lectures accompanied by small-group tutorials (a system common abroad but rare in China) to actively engage students (Zhang et al., 2023). Importantly, Shantou also invested in teacher training. The 'inquiry-based critical pedagogy' used there refers to teaching routines that organise learning around questions and problems, require students to justify claims with reasons and evidence, and rely on structured discussion and peer critique rather than extended lecture. These practices were later incorporated into faculty development programmes through workshops and mentoring that helped teachers redesign lessons, facilitate dialogue in tutorials, and assess students' reasoning processes, thereby supporting wider adoption beyond the critical thinking course itself (Dong, 2015). Therefore, to promote active learning through critical thinking, it is not only necessary to support critical thinking in terms of policies, but also to systematically train teachers, enabling them to understand what teaching purposes, content, and methods should be included in critical thinking courses.

9.3.3 Balancing 'Teaching as Core' with 'Research Excellence'

Chinese education policy documents reveal a dual mandate facing the country's universities: restoring teaching to the core of university activity while simultaneously boosting research output and global rankings. This challenge is acute under China's 'Double First-Class' initiative. Since 2016, the government has poured substantial resources into roughly 150 top universities to propel them toward world-class status. The metrics used to gauge progress, ranging from the number of high-impact publications to disciplinary league tables, have placed enormous pressure on faculty, compelling them to prioritise research, often at the expense of classroom time (Han et al., 2023; Liu et al., 2019b). As noted in the background section, China's current faculty-evaluation system has long privileged academic research over teaching. Professors who publish in leading journals and secure grants receive generous rewards, whereas teaching effectiveness is routinely overlooked. Consequently, many institutions, especially aspiring research universities, implicitly encourage faculty to cut back on teaching in order to run experiments and write papers (Guan & Meng, 2007). Over

time, this can lead to a decline in educational quality. Despite multiple policies that emphasise restoring teaching to the core of higher education practice, major challenges remain in balancing that goal with research productivity. Early-career academics on up-or-out tenure tracks feel this burden most acutely, as they must satisfy demanding research benchmarks while also delivering engaging instruction. Many newly appointed lecturers struggle to find time for pedagogical training or innovative course design, knowing that a rejected journal article or failed grant application could cost them their job (Tian & Lu, 2017).

In this context, world-class research and high-quality teaching are often treated as competing priorities, even though the intended logic of policy design is that they should be mutually reinforcing. The nation's strong demand for economic development and innovation can push faculty to prioritise one over the other (Tian & Lu, 2017). Policies aimed at enhancing university research capacity, such as the Double First-Class plan, have been associated with increases in research publications and research performance indicators among the universities included in the scheme (Peters, 2018; Wei et al., 2017). The task ahead is to ensure that this research drive does not compromise the educational quality experienced by the majority of students. In elite universities, the risk is that promotion and appraisal regimes tied to measurable research outputs crowd out time and incentives for teaching development. By contrast, in non-elite universities that receive fewer research resources, the main constraint is often capacity rather than research competition: heavy teaching loads, large classes, and limited pedagogical support leave staff little time to redesign courses or sustain feedback-intensive innovations. Policies that seek to restore teaching to the core of higher education therefore function as course corrections, intended to ensure that students' learning opportunities, including the development of critical thinking, are not lost in a system driven by publication metrics. Yet, compared with initiatives to enhance research capacity, whose outcomes are more readily visible through indicators, implementing sustained active learning reforms and building long-term teaching capacity remain daunting challenges.

9.4 Chapter summary

This chapter examined how contemporary Chinese education policies frame the educational needs and problems that critical thinking instruction can help to address. Using a scoping

review approach guided by the PRISMA-ScR framework, I identified and synthesised 31 national-level policy documents published between 2001 and 2024. The review focused on what these policies present as the purposes of education, the capabilities students are expected to develop, and the challenges the system is expected to overcome. Through thematic analysis, five recurrent policy orientations were identified: cultivating innovative talents, cultivating critical thinking (explicitly or implicitly), optimising teaching methods, restoring teaching to the core, and enhancing university research capacity. Together, these themes provide an integrated picture of how policy priorities have evolved and how they create both opportunities and constraints for embedding critical thinking within Chinese higher education.

The contribution of this chapter is to clarify an asymmetric policy architecture. Innovation is explicitly institutionalised through priority language and implementation signals, whereas critical thinking is more often embedded indirectly in expectations of independent thinking, reasoning, and evidence-based judgement. This matters because what is weakly specified is also difficult to implement consistently. When critical thinking is treated mainly as an implied capacity, it is less likely to be translated into clear learning outcomes, stable curricular space, or dedicated support for teaching and assessment.

A second implication concerns implementation. Policy instruments emphasise pedagogical change, particularly inquiry-oriented and interactive learning, yet institutional conditions often privilege research outputs. The resulting mismatch helps explain the persistent gap between policy advocacy and classroom practice, especially in non-elite institutions where class size, workload, and limited pedagogical support constrain adoption. For critical thinking to contribute to policy aims such as innovation and research capacity, reforms therefore need alignment across outcomes, staff development, and incentive structures, rather than relying on rhetorical endorsement or isolated classroom experiments.

Two limitations should be noted. The chapter analyses national policy texts and cannot directly determine how reforms are enacted at provincial, institutional, or classroom levels. In addition, identifying implicit critical thinking relies on interpretive coding, although

transparency is supported through documented procedures and an audit trail in Appendix H. Building on the policy needs and structural tensions identified here, Chapter Ten brings together the evidence on teaching purposes, course content, and teaching methods from across the thesis to develop a course design framework for Chinese higher education.

Chapter Ten: Toward a framework for critical thinking course design in Chinese higher education

10.1 Introduction

This chapter moves the thesis from descriptive comparison to recommendations for designing critical thinking courses. The preceding chapters have mapped how critical thinking is defined and debated (Chapter One). I then examined how critical thinking is presented and enacted across several empirical datasets. These include an international scoping review of stand-alone critical thinking courses (Chapter Three), a parallel scoping review of Chinese higher education research on critical thinking (Chapter Four), thematic analyses of Western and Chinese critical thinking course syllabuses (Chapters Five and Six), an analysis of Western critical thinking textbooks (Chapter Seven), a survey of Western critical thinking teachers' experiences (Chapter Eight), and a scoping review of Chinese national education policy texts (Chapter Nine). While each dataset was analysed, the purpose of the thesis is not only to compare Western and Chinese contexts. It is also to develop context-aware guidance for strengthening critical thinking teaching in Chinese universities. Chapter Ten therefore integrates these findings, proposes recommendations and a course design framework for the Chinese higher education context.

The findings from the analysis of Western data show a pattern of relative stability across datasets. Develop Analytical Skills frequently appears as an explicit course purpose. Argument Analysis is positioned at the centre of course content. Active Learning is adopted as the primary method through which analytical engagement is enacted. These themes recur across research descriptions, syllabuses, textbooks, and teacher accounts. Other purposes and content themes, including creativity, civic engagement, and Problem Solving, are present but display greater variation in frequency and structural prominence. The convergence of analytical development, argument-centred content, and active learning therefore suggests a recurrent organisational pattern within stand-alone critical thinking teaching.

Analysis of Chinese data reveals a different configuration of emphasis. Education policies

prioritise innovation and the cultivation of innovative talent, often accompanied by institutional mechanisms and funding structures. References to critical thinking appear less prominently and are frequently embedded within broader developmental goals. Chinese literature and syllabuses demonstrate increasing engagement with analytical training and argumentation, yet course boundaries and core objectives remain unevenly articulated. As a result, the relationship between innovation-oriented policy discourse and the internal structure of critical thinking courses requires careful consideration. Designing critical thinking teaching within Chinese higher education involves aligning policy expectations with a teachable course core.

This chapter has three objectives. First, it brings together Western findings by summarising shared patterns across course syllabuses, textbooks, and teacher reports. It then relates these patterns to the broader international scoping review. This step examines whether stand-alone critical thinking teaching in Western higher education shows a consistent course structure in terms of teaching purposes, content, and methods. It also helps to judge whether the pattern reflects more than regional or individual preferences. Second, the chapter examines the Chinese context by combining findings from the Chinese scoping review, Chinese syllabuses, and Chinese policy analysis. The aim is to clarify the current research landscape and identify what Chinese critical thinking courses already include. It also highlights areas where further development would be most beneficial. Third, drawing on both sets of regional data, the chapter develops a critical thinking teaching framework for Chinese higher education.

Before reconstructing a Western stand-alone critical thinking course model, the chapter specifies how the policy analysis in Chapter Nine functions as a set of design constraints for what counts as a feasible and responsible critical thinking course core in Chinese universities. Section 10.2 sets out these constraints and derives design criteria that guide the reconstruction in Section 10.3 and the Chinese blueprint developed in Sections 10.4 and 10.5.

10.2 Policy grounding for course design

This section draws on the policy analysis in Chapter Nine to derive design constraints for this chapter. In this sense, policy discourse constitutes a set of design constraints by shaping

what receives institutional priority, how far capability expectations are operationalised, and what accountability pressures structure teaching and assessment. The purpose of this section is to translate these contextual signals into design-relevant constraints and criteria that will be used to organise the reconstruction strategy and the Chinese course blueprint developed later in the chapter.

A first policy-related constraint concerns institutional implementation under weak specification. Policy texts frequently call for higher-order capacities such as the ability to make better decisions, to analyse information, and to reason well, yet these expectations are often formulated as broad descriptors rather than operational performance specifications. When policy language remains at this level, universities and teachers may respond through symbolic compliance, for example by adopting course titles and broad outcome statements, while the teaching core varies across institutions because a shared template for training and evaluation is not clearly established. The design implication is that a stand-alone critical thinking course benefits from defining a protected and assessable core that can reduce drift toward either conceptual legitimation alone or broad expansion into loosely stated virtues that are difficult to train and assess transparently.

A second constraint concerns the structural friction between policy advocacy for active inquiry and the entrenched teaching norms of knowledge transmission and convergent assessment in Chinese universities. Although national policies promote independent thinking and capability transformation, prevailing classroom routines and evaluation practices often incentivise authoritative delivery and answer-oriented performance. Under these conditions, policy calls for critical inquiry do not automatically lead to sustained analytical work in classrooms. For course design, the key challenge is to use discussion formats that students feel comfortable participating in and that also produce learning gains, so that questioning and critique become a normal part of academic learning rather than something students avoid because it may cause embarrassment or interpersonal tension. Therefore, interactive teaching methods should be structurally integrated into the course design. Later sections will specify how constructive dialogue can be transformed into a standard, low-risk classroom habit through structured activities and assessable learning

products.

A third constraint arises from the asymmetrical policy architecture identified in Chapter Nine. Innovation is repeatedly named as a priority and is backed by concrete funding and institutional programmes, whereas critical thinking is more often treated as an implied prerequisite and receives far less direct curricular support. This asymmetry matters for course design because it may shape what universities tend to treat as credible evidence of policy alignment. When alignment is expressed mainly in the language of 'innovation,' a stand-alone critical thinking course can be judged by whether it appears to generate innovation-type outputs. Under such expectations, teaching can drift toward activities and assessments that mimic the visible indicators the policy system already rewards, such as technological breakthroughs, patents, or research-style products and publication-like outputs. The risk is not that these outputs are undesirable, but that they are poor proxies for what a critical thinking course can actually teach and grade fairly, and they can displace the evaluative teaching that critical thinking is well placed to deliver. A more defensible alignment strategy is therefore to position the stand-alone critical thinking course as a targeted response to a specific implementation gap. As Chapter Nine suggests, while policy promotes innovation-oriented talent cultivation, it provides limited guidance on the judgement processes through which ideas are tested and improved in everyday academic work, such as questioning assumptions, weighing competing evidence, handling objections, and refining claims in response to critique. The critical thinking course should therefore bound its claims. It does not produce innovation as a terminal output; it trains and assesses the reasoning work that makes innovation more robust. By anchoring its contribution in decision quality and evaluative rigour in information-rich environments, the course translates policy aspirations into a teachable and assessable classroom mechanism: students are evaluated on how well they analyse arguments, justify evidence choices, respond to counterarguments, and revise positions when reasons change.

Taken together, these constraints motivate three design criteria that guide the remainder of Chapter Ten. First, the course should specify an operational core expressed as repeatable reasoning performances and associated learning products, so that capability claims are

anchored in assessable evidence rather than abstract outcomes. Second, teaching and assessment should be organised around structured routines that reliably elicit analytical performances under prevailing classroom conditions, so that inquiry and critique become normalised through low-risk formats and assessable outputs. Third, the course should pursue policy alignment through a bounded translation strategy. Instead of designing assessments around innovation-type outputs, the course should translate innovation discourse into the decision processes that policy presupposes but rarely specifies at the curricular level. These criteria explain why the chapter adopts a reconstruction strategy before proposing a Chinese blueprint.

10.3 Reconstructing a Western course logic of critical thinking teaching

This section moves from frequency patterns to integrated understanding about what a mature model of critical thinking teaching may look like, based on four layers of evidence: the scoping review (Chapter Three), Western syllabuses (Chapter Five), textbooks (Chapter Seven), and teacher survey responses (Chapter Eight). These sources capture different layers of curricular reality and have different incentives for what they foreground. Research studies often summarise course design at a higher level; syllabuses are written to communicate expectations and assessment arrangements to students; textbooks codify teaching into teachable sequences and practice tasks; and teacher accounts reflect what is feasible under local constraints. The aim is to construct a model from multi source evidence, rather than merely describing how often different themes appear across datasets. It therefore requires an evaluative framework that can translate thematic distributions into curricular function. In this section, the study proposes three criteria, A, B, and C, to move from empirical mapping to structural reconstruction. A theme is treated as central not simply because it is frequently mentioned, but because it shapes how other elements are introduced, sequenced, and used within the course. The three criteria function as an evaluative framework for synthesising findings across datasets and judging the curricular role of recurring themes. They are used to distinguish a stable course core from peripheral or context-specific elements. This reconstruction provides an analytical reference point for considering which features might be retained, adapted, or excluded in the proposed framework for Chinese higher education.

Criterion A is designed to identify the most commonly found characteristics across sources. Mixed methods research consistently emphasises triangulation across multiple data sources strengthens the credibility, robustness of interpretation, and saturation. Within this thesis, the core themes are shown to be evident across data sets, methods, and analysis, thereby improving the credibility and potential transferability of findings (Carter et al., 2014; Fetters et al., 2013; O'Cathain et al., 2010; Tracy, 2010).

Criterion B focuses on whether organising dependence is present and whether a spine capability can integrate modular components in a principled way. A curriculum is not a set of parallel topics, but a structured system shaped by organising logics. Both backward design and learning-oriented course planning argue that curriculum structure and teaching activities should be derived from intended learning performances and acceptable evidence. This logic therefore requires the identification of a spine capability that can integrate other modular components in a principled way (Wiggins & McTighe, 2005; Fink, 2013).

Criterion C assesses operational and assessable centrality. For an element to qualify as the structural core of a stand-alone course, it needs to be decomposable into observable learning performances and aligned with teaching activities and assessment tasks. Constructive alignment theory holds that intended outcomes should be supported coherently by teaching and assessment; otherwise, misalignment between goals and evaluation will undermine the accumulation and verification of learning gains (Biggs, 2014). Research on feedback and formative assessment likewise stresses that capability development becomes reliable only when performance is externalised in forms that can receive feedback and when learning is organised through repeated cycles of practice and revision (Nicol & Macfarlane Dick, 2006; Boud & Falchikov, 2006). Using Criterion C, the analysis distinguishes between themes that can be operationalised and assessed as the course backbone and themes that are better treated as extensions or application directions. Some themes can be demonstrated and sustained through feedback loops, and thus can function as the curricular backbone. Others may be educationally valuable, but if they lack a broadly operable pathway for training and evaluation, they are better positioned as extended meanings or application directions, rather than as structural cores.

10.3.1 Criterion A: cross-source stability

Table 10-1 reflects the frequency of themes across four data sets.

Table 10-1 Frequency of themes across four data sets

Dimension	Theme	Scoping Review (n = 64)	Western Syllabuses (n = 44)	Textbooks (n = 22)	Teacher Survey (n = 19)
Purpose	Develop Analytical Skills	62/64 (97%)	44/44 (100%)	22/22 (100%)	17/19 (89%)
	Enhanced Learning	52/64 (81%)	26/44 (59%)	16/22 (73%)	6/19 (32%)
	Better Decision Making	37/64 (58%)	25/44 (57%)	18/22 (82%)	9/19 (47%)
	Develop Critical Thinking Dispositions	30/64 (47%)	26/44 (59%)	22/22 (100%)	8/19 (42%)
	Civic Engagement	20/64 (31%)	15/44 (34%)	2/22 (9%)	1/19 (5%)
	Develop Creativity	12/64 (19%)	12/44 (27%)	1/22 (5%)	0/19 (0%)
	Effective Communication	18/64 (28%)	34/44 (77%)	18/22 (82%)	7/19 (37%)
Content	Argument Analysis	61/64 (95%)	38/44 (86%)	22/22 (100%)	17/19 (89%)
	Foundations and Importance of Critical Thinking	11/64 (17%)	36/44 (82%)	22/22 (100%)	3/19 (16%)
	Fallacies	16/64 (25%)	31/44 (70%)	22/22 (100%)	2/19 (11%)
	Critical Thinking	23/64 (36%)	13/44 (30%)	22/22 (100%)	7/19 (37%)

	Dispositions as Content				
	Dialogue and Communication as Content	14/64 (22%)	25/44 (57%)	5/22 (23%)	0/19 (0%)
	Academic Development	14/64 (22%)	33/44 (75%)	4/22 (18%)	1/19 (5%)
	Problem Solving	18/64 (28%)	19/44 (43%)	4/22 (18%)	1/19 (5%)
Method	Active Learning	58/64 (91%)	33/44 (75%)	22/22 (100%)	12/19 (63%)
	Oral Learning	32/64 (50%)	32/44 (73%)	6/22 (27%)	7/19 (37%)
	Written Learning	23/64 (36%)	30/44 (68%)	8/22 (36%)	7/19 (37%)
	Collaborative Learning	20/64 (31%)	30/44 (68%)	6/22 (27%)	6/19 (32%)
	Technology-Enhanced Learning	19/64 (30%)	29/44 (66%)	3/22 (14%)	1/19 (5%)

From Table 10-1, one configuration of themes stands out more clearly than any other: across four different data sets, the same three themes remain at the top of their respective dimensions. Develop Analytical Skills is the only purpose that approaches complete cross-source consistency, remaining highly prevalent from the scoping review through to syllabuses, textbooks, and the teacher survey. In parallel, Argument Analysis is the most repeatedly foregrounded content focus, and Active Learning is the most reported method theme. What matters within Criterion A is not merely that each theme is frequent in a single dataset, but that the same cluster recurs across different forms of evidence that have different incentives for what they foreground.

Read through the lens of cross-source stability, the table therefore supports an inference: the

most common teaching pattern represented in this study is an argument-centred pathway for developing analytical skills, enacted through active learning designs. This is the pattern that remains simultaneously high in prevalence and stable in visibility across all four sources. Other themes certainly appear, sometimes at substantial levels in particular datasets, but they show greater variation in how consistently they surface across sources.

10.3.2 Criterion B: organising dependence

To assess organising dependence, the analysis examines whether a candidate spine integrates purposes, content, and methods by shaping task design and stabilising assessment practices.

Purpose dimension

A purpose counts as the course spine when other stated purposes repeatedly connect back to it and are largely realised through it, so that it becomes the organising route through which the course delivers its wider aims. On this basis, Develop Analytical Skills functions as the root purpose of teaching because it provides the course's teach-and-grade mechanism: students repeatedly identify, reconstruct, evaluate, and revise arguments, and this work anchors graded assignments and classroom participation. Enhanced learning, better decision making, dispositions, and communication are not absent, but they enter the curriculum through analytical performance requirements rather than through independent modules.

Having identified the cross-source recurring configuration under Criterion A, the analysis now uses selected syllabuses and textbooks to show how this configuration functions structurally within course design. In the Michigan State University syllabus (Chapter Five), this dependence relation is stated explicitly. The 'Advice for Success' section clarifies that course evaluation is not based on a student's opinions as such, but on whether the student can recognise, analyse, persuasively articulate, and critically evaluate the reasons for and against views. The syllabus also specifies that students must state a position and defend it with reasons, and that they are expected to evaluate reasons for and against competing views. It then defines the 'fundamental aim' as developing the core skills of argument analysis and evaluation, and operationalises these skills in learning objectives that set out a workable performance chain, including identifying arguments, analysing their structure, evaluating

their strength, and responding critically. In this design, broad promises such as problem solving and rational argument are presented as what reasoning is for, whereas the trainable and assessable object remains argument analysis and evaluation. The same structure is visible in the City University of New York syllabus (Chapter Five). The document lists broad general-education outcomes, including ethical judgement and analysis of social trends. However, its assessment pathway consolidates these aims into a single assessable core performance. The capstone and its scaffolded assignments require students to address a contemporary issue by analysing, reconstructing, and critiquing a complex argument. Ethical, social, and decision-related aims therefore do not appear as independent training lines. They are required to be achieved through a shared analytic chain, namely the analysis, reconstruction, and critique of complex arguments. This dependence pattern aligns with the Chapter Five frequency results, in which Argument Analysis is the top-ranked content theme and Active Learning the top-ranked method theme across datasets.

Textbooks make the enabling logic more explicit by presenting analytical skills as the mechanism through which other purposes are achieved. In Anne Thomson's (1996) *Critical Reasoning*, the introduction defines critical reasoning as giving reasons for beliefs and actions, and analysing and evaluating one's own and others' reasoning, with the further aim of constructing better reasoning. It identifies a set of foundational skills that support these activities, including recognising reasons and conclusions, identifying implicit assumptions, evaluating evidence, and judging whether conclusions follow. It also treats clarity of expression as a basic condition for putting these skills together in communication and for responding to challenges. In this framing, communication is not a parallel purpose with a separate pathway. It is the expressed form of analytical work in interaction. Trudy Govier's (2010) *A Practical Study of Argument* makes the dependency claim even more directly. In 'To the Student' and the preface materials, it presents learning to identify and evaluate arguments as highly useful for academic learning and practical problem solving, and as contributing to clear and effective communication. It organises the book around a trainable sequence, moving from finding and interpreting arguments to evaluation and construction, and it treats transfer beyond the classroom as a consequence of mastering that sequence. The logic is not that decision-making, learning, and communication form parallel curricular cores.

Rather, they are presented as benefits that become stable only when the student can reliably identify, structure, and evaluate arguments.

Across these examples, the dependency direction is consistent. Develop Analytical Skills is the purpose that supplies the repeatable teaching engine: argument identification, reconstruction and evaluation. Other purposes are presented as what this engine enables, where it transfers, and what attitudes and communicative standards are required to run it.

Content dimension

In the content dimension, themes show a close structural relationship with argument analysis. Many syllabus documents return across weekly organisation and task requirements to identifying arguments, reconstructing them, and evaluating their strength, and then introduce other content elements through the same reasoning frame (see Chapter Five). Academic Development is often framed as the application of argumentative competence to academic reading and writing, rather than as a stand-alone unit on generic study skills. For example, the University of Adelaide organises essay assignments around evaluating claims against explicit standards of evidence and reasoning; and Douglas College treats argument-driven writing as a primary vehicle for assessing academic performance. In this sense, the teachability of academic development is operationalised through students' capacity to complete assessable argumentative work in academic contexts, making it an application outlet of the organising spine rather than an independent strand. Fallacies display a similarly instrumental positioning. Michigan State University introduces evaluative principles first, then locates fallacies within different stages of evaluation and juxtaposes them with standards of inferential strength and particular argument types. CUNY and the American Public University System likewise embed fallacy identification within reasoning-skill training. These designs imply that fallacies are not taught as an isolated checklist, but as diagnostic resources for explaining why reasoning is weak, functioning as a toolkit within the evaluation phase. Dialogue and Communication as Content are also commonly defined as reasoning practices: Simon Fraser University presents discussion as a space for testing reasons and responding to objections, while the University of the Sunshine Coast emphasises oral activities in which students state and defend claims and revise their positions in the face

of counterarguments. Here, dialogue content is written into the same 'reasons-objections-revision' pathway, rather than treated as a separate communication track.

Textbook chapters break down argument analysis into defining arguments, identifying arguments, reconstructing arguments, classifying arguments, and evaluating arguments. Once argument analysis is articulated at this level of procedural detail, the roles of other content themes can be specified more precisely in relation to particular stages and demands of performance. Foundations and Importance of Critical Thinking, together with Language and Definition, function as front-end clarification resources. They delimit what counts as an argument, stabilise key terms, and reduce ambiguity at the stages of identifying and reconstructing arguments. Fallacies offer a diagnostic repertoire for locating recurrent weaknesses and common error patterns, thereby making comparative judgements of argument strength more tractable. Themes such as probability, biases and heuristics, emotion, and scientific knowledge operate as extensions of evaluation rather than parallel content strands. Probability supports the appraisal of non-deductive arguments in which evidential support is uncertainty-sensitive. Biases and heuristics make explicit predictable cognitive shortcuts that can distort interpretation and judgement. Emotion foregrounds affective and motivational interference that can compromise appraisal even when evaluative criteria are known. Scientific knowledge contributes norms for evidential assessment in contexts where claims depend on explanation, causal inference, and standards of good evidence. The key point is functional allocation. These themes are best understood as role-specific resources distributed across a single argument-evaluation workflow, each strengthening a distinct stage or demand of the same analytical sequence, rather than constituting independent curricular cores.

Method dimension

At the method level, Active Learning is reported in combination with other teaching methods. Oral discussion and debate externalise reasoning under challenge. Writing produces durable artefacts of reasoning that can be assessed. Peer review structures critique and revision. Technology-Enhanced Learning extends practice and stabilise reconstruction. Macquarie University, for instance, assembles online quizzes, a reflective writing task (Personal

Argument), peer review, a Final Scenario Report, and online engagement tasks into a staged assessment chain, indicating that 'online tools, written outputs, peer feedback, and scenario-based tasks' are organised around a staged sequence of tasks rather than functioning as separate, self-contained elements. The University of Richmond similarly links an online argument-mapping programme to frequent in-class practice and subsequent debates, so that the technology functions as a connector between sustained practice and classroom activity rather than as an optional add-on. These courses present a structural fact: course delivery is designed around ongoing cycles of practice and feedback, while oral, written, collaborative, and technology-enhanced arrangements mainly serve to distribute practice across settings and timescales and to make participation sustainable. That is, they lower the recurring costs of engagement by distributing analytical work into smaller, low-stakes tasks across online and in-class settings, supported by prompts and frequent feedback. Participation can then be maintained as a routine practice rather than depending on occasional high-pressure performances.

The teacher survey also suggests that many teaching methods are closely intertwined with active learning. For example, oral learning is not usually organised around teacher talk as the core activity; instead, it is more often implemented by requiring students to externalise their reasoning in interaction. The survey describes effective oral activities in terms of 'dialogue, peer questioning' and expects students to provide 'explicit justification of claims.' Under this arrangement, the learning value of oral work depends on students articulating reasons on the spot, responding to challenges, handling objections, and engaging in active practice rather than passive reception.

10.3.3 Criterion C: operationalising through classroom processes

Criterion C examines whether the proposed organising spine is realised as a set of classroom processes that students can perform, practise repeatedly, and be evaluated on, rather than remaining at the level of thematic prominence. The focus is therefore on how Develop Analytical Skills is operationalised through argument analysis and enacted via active-learning structures that make analytical work visible in tasks, participation, and assessment.

The University of California, Berkeley syllabus illustrates this pattern clearly. At the level of purposes, it defines key capacities to be developed as clear and rigorous reasoning, critical reading, and effective argument expression. Its content is organised in two stages: the first introduces the basic structure of arguments and how arguments work; the second requires students to apply these concepts to analysing others' arguments and constructing their own. More importantly, the syllabus specifies the learning process at the level of method: students are expected to analyse arguments, interpret texts, and construct reasoning; classroom learning is organised around continuous participation in guided analytical activities; and the analytical work is institutionalised through in-class group tasks and their associated assessment weighting. In this way, argument analysis is not treated merely as a topic to be covered, but as an organised, observable, and assessable form of learning activity embedded in classroom time.

The University of Western Australia unit description presents the same mechanism in a different format. It explicitly frames 'analysing, creating and evaluating arguments' within the unit's positioning and learning outcomes, and requires these skills to be applied to cases drawn from philosophy and other disciplines. At the level of method and assessment, the unit includes workshop participation as an assessed component, requiring students to work with concrete materials in workshop settings and to carry out operational tasks such as identifying arguments, judging relevance, testing what follows from claims, and identifying implicit assumptions. In this way, analytical-skill training is embedded within interactive classroom structures.

Textbook evidence further supplies operational procedures that can be transferred directly into classroom practice. Bassham and colleagues (2011) organise argument analysis as a sequence of reproducible steps, locating conclusions and reasons in natural language materials, mapping the inferential links between premises and conclusion in a structured form, distinguishing different premise configurations, and then checking for weak points in the reasoning chain. Such steps can readily be adapted into short in-class exercises and peer-checking tasks, enabling students to learn argument analysis by completing reconstructions and exposing defects. Halpern's (2013) textbook places greater emphasis on structured

worksheet practice, requiring students to set out an argument in a fixed format by listing the claim, premises (reasons), supporting evidence, and potential rebuttals item by item, and then making explicit judgements about the strength of the support and the extent to which counter-considerations weaken the case. This provides a clear completion and discussion framework when argument analysis is enacted in class, facilitating immediate feedback and repeated practice.

Teacher-survey evidence adds an implementation-level complement to these structures. One teacher describes a hybrid format combining lecture and visual demonstrations, but identifies the core of classroom work as extensive practice exercises, assessed through work-to-competency computer-lab exams to verify procedural mastery. The materials are drawn from everyday discourse and short public-argument genres, such as opinion columns and letters to the editor, sourced from both print newspapers and online news media, and supplemented with wider web-based examples. Taken together, these sources indicate an implementable pathway: argument analysis as central content is decomposed into operational steps and templates, and is then continuously driven and assessed through active-learning mechanisms such as workshops, in-class practice, and collaborative tasks, through which analytical skills are gradually built and stabilised.

10.3.4 Supplementary content

While the organising spine establishes the structural core of the course, it does not encompass all the pedagogical elements required for critical thinking teaching. A defensible curricular structure must also clarify how supplementary components are structurally related to the spine and what functions they perform within the overall framework. Accordingly, drawing on evidence from the textbook analysis, this section introduces three areas of supplementary content: psychology, constructive dialogue, and probability. These contents are not parallel alternatives to the spine; rather, they operate as functional extensions built upon it, constituting structural expansions of the conditions under which argument analysis is enacted in contexts.

First, the psychology content covers memory, emotion, heuristics, and cognitive biases. Its

main contribution is to render explicit the internal conditions of analytic performance, thereby accounting for why people in general often display deviations when identifying, reconstructing, and evaluating arguments. While argument analysis is presented as a staged procedure, learners' capacity to carry out that procedure is constrained by attention allocation, working memory limitations, emotional arousal, and motivated reasoning. Incorporating these psychological mechanisms does not displace argument analysis as the core content; rather, it provides a conceptual toolbox for recognising predictable sources of interference and a set of practicable strategies for calibration within the analytic cycle. For this reason, the psychology content continues to support Develop Analytical Skills, while also aligning naturally with Enhanced Learning and Develop Critical Thinking Dispositions. Enhanced learning is strengthened when students are better able to manage cognitive load, organise information, and consolidate learning through structured reflection. Dispositional development is supported when tendencies such as overconfidence, dogmatism, or affect-driven judgement become objects of guided scrutiny, making intellectual humility, openness to revision, and self-monitoring more trainable in practice. Methodologically, the content remains closely tied to active learning, but it is most effectively enacted through reflective and contrastive tasks embedded within argument analysis: students complete an initial analysis, identify likely bias points in their own reasoning, compare alternative evidence selections, and revise evaluations through peer feedback, thereby integrating bias awareness into repeated analytic performance.

Second, the constructive dialogue content functions as a necessary extension because argument quality in many educational and real-world contexts is not demonstrated only through static evaluation of texts, but through interactions such as questioning, clarification, rebuttal, and negotiated revision. If argument analysis is trained primarily as an individual, text-based evaluative exercise, learners may produce structurally coherent analyses in written assignments yet struggle to mobilise the same analytical competence in discussion, debate, or collaborative writing. The dialogue content addresses this gap by translating norms of argument evaluation into norms of interaction, enabling analytic moves to be practised as sequences of communicative action. Activities such as structured discussion, rotating roles for challenge and defence, peer review, and perspective-taking exercises can

make reasoning publicly visible, expose weaknesses in support relations, and invite iterative revision of claims. In this sense, the content continues to serve Developing Analytical Skills, while also more directly realising Effective Communication.

Third, the probability content extends the spine by enabling argument evaluation to handle uncertainty, risk, and degrees of evidential support, rather than relying on binary judgements of correctness or simple classifications of 'strong' versus 'weak.' Many real-world arguments are not deductive but probabilistic, disputing what is more likely, what level of risk is acceptable, or how strongly evidence supports a conclusion under incomplete information. In the absence of basic probabilistic representations, learners may conflate subjective confidence with evidential weight or treat fragmentary evidence as decisive. Introducing probability into critical thinking teaching does not imply replacing argument analysis with mathematical technique. Rather, it provides conceptual tools for articulating and revising support strength, such as sensitivity to base rates, conditional reasoning, evidential updating, and explicit risk trade-offs. Consequently, the content continues to reinforce Developing Analytical Skills, while also aligning closely with Better Decision Making, because it offers a more specific pathway for training judgement under uncertainty and for revising conclusions when new information arises.

10.3.5 Excluded themes

Across the four datasets, Civic Engagement and Develop Creativity (both purpose themes), together with Problem Solving (a content theme), require careful treatment. This caution does not imply that these themes lack educational value. Rather, it reflects the need to avoid presenting them as stable structural cores of stand-alone critical thinking courses or inferring curricular architecture from their partial visibility. The four data sets discussed in this chapter suggest three reasons for caution. First, their presence fluctuates markedly across sources, making it difficult to establish stable main line evidence. Second, in course documents they are often positioned at the level of overarching aims or application contexts, rather than as direct objects of repeated classroom training and assessment. Third, their conceptual boundaries frequently blur with the core training focus of critical thinking, creating ambiguity about what the course is teaching and evaluating. Each theme is discussed in turn

below.

Civic Engagement

Across the four sources, the evidence converges in the same direction, indicating that civic engagement is not often enacted as a stable 'core curricular commitment' in stand-alone critical thinking courses. Its visibility and structural status are consistently weaker than the purpose chain centred on analytical training. In terms of frequency, only 20/64 (31%) studies in the scoping review explicitly write civic engagement into course purposes. The same theme appears in only 15/44 (34%) Western syllabuses. It is marginal in the textbook dataset, appearing in only 2/22 (9%) textbooks. It is rare in the teacher survey: only 1/19 (5%) teacher mention civic engagement when summarising course aims. Research writing and course descriptions may still emphasise civic value at the level of educational significance, but as the evidence moves closer to vehicles of implementation, such as the organising structure of textbooks and teachers' practice-oriented summaries, civic engagement recedes markedly. This pattern suggests that it seldom carries the kind of commitment that is readily operationalised, trained, and assessed within the course.

The curricular positioning of civic engagement requires clear boundaries. This chapter does not deny the legitimacy of civic engagement. Some studies do frame critical thinking in social terms, referring to 'informed citizens', 'public deliberation', and resistance to propaganda or manipulation. However, it also notes that once civic engagement is elevated to the central course objective, the conceptual scope of critical thinking can easily expand, and in some accounts, it becomes difficult to distinguish critical thinking from traditions of critical theory that foreground critique of power structures. Within such framings, 'critical' no longer primarily denotes clarity of argument, reliability of evidence, and fairness of evaluation. Instead, it may shift toward normative commitments and the advocacy of political action, making course aims harder to specify in teachable and assessable terms. For this reason, a more defensible arrangement is to treat civic engagement as a context for practice or an intended application of analytical skills, rather than as a core teaching purpose. Courses may use public and social issues as case material through which learners practise identifying, reconstructing, and evaluating arguments, with the expectation that these

analytical standards can then be applied in public discussion. By contrast, treating ‘cultivating a particular civic stance or action orientation’ as a trainable and measurable organising objective is less well supported. Such a move not only lacks a replicable teaching pathway in textbook structures and classroom practice, but also increases the risk of conceptual stretching and evaluative ambiguity, thereby weakening the analytical coherence of critical thinking teaching.

Develop Creativity

Creativity is commonly defined as the production of ideas or products that are both original (novel/uncommon) and effective (useful/appropriate), often achieved through divergent thinking that explores multiple possibilities rather than settling immediately on a single option (Runco & Jaeger, 2012; Maley, 2015). At the same time, some definitions further stress surprise (i.e., the creator did not fully anticipate the idea’s utility in advance), highlighting creativity’s non-routine character (Simonton, 2016). By contrast, stand-alone critical thinking courses tend to foreground analysis, evaluation, and revision. The two can be complementary, but if creativity is treated as the central course purpose, there is a risk that producing more ideas becomes conflated with evaluating ideas well, and that assessment standards become less transparent. This tension is reflected across the remaining datasets. In syllabuses, creativity appears relatively infrequently and is often embedded within broader graduate attribute statements. By contrast, the more detailed sections of syllabuses that are aligned with assessment specify argument tasks, writing assignments, discussion formats, and evaluation criteria. Creativity thus functions more as higher-level institutional discourse than as the organising target of weekly teaching and grading structures.

The textbook dataset strengthens this reading. Creativity is rarely presented as an explicit organising purpose or chapter framework. Instead, textbooks concentrate on conceptual clarification, argument structure, evaluative standards, common errors, and practice tasks, content that can be operationalised into exercises with definable answer frameworks. This emphasis reflects the genre’s orientation toward procedural teachability and structured practice.

In the teacher survey, creativity does not appear as a primary course purpose. A plausible interpretation is that teachers are expected to provide inspectable evidence of what students have learned. In the critical thinking context, creativity is difficult to operationalise with the same transparency and consistency as argument evaluation. It therefore tends to be retained as a potential by-product or extended benefit of training, rather than as the central evaluative object of classroom work.

The convergent implication across datasets is that creativity may legitimately be described as a possible outcome or extension of critical thinking teaching, but it is less defensible to treat it as the organising purpose of a stand-alone critical thinking course. A more stable formulation would explain how analytic and argumentative training helps students render their ideas more defensible and well-grounded, thereby indirectly supporting creative production, rather than positioning 'creative output' itself as the primary assessable goal. This has implications for the Chinese policy discussion, where innovation is often foregrounded. Rather than making creative output the course's primary purpose, the course positioning proposed in this chapter aligns with innovation mainly through case selection and transfer tasks while retaining an assessable analytical spine. This alignment is discussed further in Section 10.5.1, which clarifies course positioning and boundaries in the Chinese policy context.

Problem Solving

Caution regarding Problem Solving rests on two related considerations evident across the datasets: limited cross-source stability and blurred conceptual boundaries. Across the four sources, the evidence consistently indicates that Problem Solving, as a content theme, does not function as a stable high-visibility component in stand-alone critical thinking courses. In the scoping review, the theme appears in 18/64 (28%) studies. In Western syllabuses it rises to 19/44 (43%), suggesting somewhat greater visibility, but still not at a level that would indicate cross-source consistency. Moving to the textbook dataset, which is closer to how teaching content is actually organised and sequenced, the frequency drops to 4/22 (18%). It is rarer still in the teacher survey: only 1/19 (5%) teacher mention Problem Solving when summarising what they teach or what they treat as a central focus. Taken together, these

frequencies suggest that Problem Solving is more likely to enter courses in a fragmented way, or to be covered indirectly as an application context for argument-analytic training, rather than being sustained and organised as a repeatable mainline across most stand-alone critical thinking courses.

The boundary issue is equally important. The scoping review already notes that many activities described as Problem Solving are substantively combinations of inference and evaluation. Treating Problem Solving as an independent content module risks re-teaching the same evaluative procedures under a different heading. The teacher survey includes remarks emphasising the need to distinguish critical thinking from Problem Solving or creative thinking, indicating practitioner awareness of conceptual overlap. The textbook dataset further supports this caution: textbooks organise content through argument analysis sequences and practice chains rather than adopting Problem Solving as the principal structural line. In doing so, they implicitly manage boundaries by favouring operational procedures over broad labels.

A more defensible formulation, therefore, is to position Problem Solving as an application context in which argument analysis and evidence evaluation are exercised in complex scenarios. Courses may legitimately employ case-based decisions, scenario reports, and solution comparisons. However, the core object of training and assessment remains the structure of reasons, the quality of evidence, and the strength of inference, rather than an undifferentiated notion of ‘Problem Solving ability.’

In sum, Civic Engagement, Develop Creativity, and Problem Solving share the same profile across the four strands of evidence: they are variously value-directed, weakly supported as structural cores, and prone to boundary expansion. If they are elevated, at the level of the model, to the status of core training targets in stand-alone critical thinking courses, at least three foreseeable problems follow.

First, the model’s replicability would be weakened. Given the marked fluctuation of these themes across data sources, and their further retreat in textbooks and practice-oriented

teacher accounts, treating them as the ‘spine’ risks generalising from a minority of courses or from a particular rhetorical tradition, thereby reducing cross-context stability. Second, teaching and assessment would become less transparent. These themes are often positioned at the level of overarching aims or application contexts. Once they are framed as primary commitments, however, they require sustained task sequences and clear grading criteria. The current evidence does not indicate a stable, operable teaching pathway that can support such commitments. Third, blurred conceptual boundaries would introduce assessment ambiguity. Civic Engagement can trigger an expansion of what counts as ‘critical’ and pull the course toward objectives focused on cultivating a particular civic position or action orientation; Creativity can blur the distinction between generative output and the evaluation of reasons; and Problem Solving often overlaps with argument evaluation and evidence weighting. As a result, what the course is teaching and assessing becomes harder to specify, weakening analytical coherence and academic defensibility as a stand-alone university subject with a delimited teachable content line and assessable learning outcomes.

For these reasons, when proposing a model for Chinese higher education, these three themes are not incorporated as core components of the curricular backbone. This does not imply that they are rejected. Rather, they are assigned a more peripheral role: first, as case materials and transfer directions, where public issues, real decision scenarios, and open-ended problems supply contexts for practising argument analysis; and second, as plausible extended benefits, indirectly supported through the transfer of analytical training into writing, discussion, and judgement. The model’s core training chain remains organised around objects that can be practised repeatedly and assessed with clarity, in order to avoid conceptual stretch and evaluative inconsistency, and to provide a firmer operational basis for institutionalising critical thinking teaching in the Chinese context.

10.4 Chinese critical thinking teaching models and needs

This section draws on the Chinese course syllabuses and scoping review to identify the course features represented in the available evidence. It then considers these findings alongside the policy analysis to clarify the contextual requirements that a stand-alone course framework would need to address. The analysis is organised around teaching purposes,

course content, and teaching methods.

10.4.1 Chinese critical thinking teaching models

To make the cross-source picture transparent, Table 10-2 synthesises the coded results from Chinese critical thinking syllabuses (n = 18) and the Chinese scoping review (n = 6) using the shared framework, thereby summarising the teaching configuration most commonly represented in current Chinese critical thinking course evidence.

Table 10-2 Frequency of themes across two data sets

Dimension	Theme	Chinese syllabuses (n = 18)	Chinese studies (n = 6)
Purpose	Develop Analytical Skills	16/18 (89%)	6/6 (100%)
	Better Decision Making	11/18 (61%)	3/6 (50%)
	Enhanced Learning	10/18 (56%)	2/6 (33%)
	Develop Critical Thinking Dispositions	10/18 (56%)	5/6 (83%)
	Effective Communication	10/18 (56%)	0/6 (0%)
	Develop Creativity	7/18 (39%)	4/6 (67%)
	Civic Engagement	3/18 (17%)	3/6 (50%)
Content	Foundations and Importance of Critical Thinking	17/18 (94%)	4/6 (67%)
	Argument Analysis	16/18 (89%)	6/6 (100%)
	Fallacies	13/18 (72%)	1/6 (17%)
	Academic Development	9/18 (50%)	2/6 (33%)
	Problem Solving	7/18 (39%)	2/6 (33%)
	Critical Thinking Dispositions as Content	5/18 (28%)	2/6 (33%)
	Dialogue and Communication as Content	4/18 (22%)	2/6 (33%)
Method	Active Learning	9/18 (50%)	6/6 (100%)
	Oral Learning	7/18 (39%)	4/6 (67%)
	Written Learning	4/18 (22%)	3/6 (50%)
	Collaborative Learning	4/18 (22%)	4/6 (67%)
	Technology-Enhanced Learning	1/18 (6%)	2/6 (33%)

Teaching purpose

With respect to purposes, Chinese critical thinking courses are framed in strategic and macro-level terms. Compared with the more common Western narrative that treats critical thinking primarily as an individual general competence, Chinese course and research literature more often locate critical thinking within a national development framework, presenting it as a foundational capability for building an 'education powerhouse,' a 'science and technology powerhouse,' and a 'talent powerhouse.' Both the scoping review and the policy texts indicate that critical thinking is frequently discussed in the same discursive chain as innovation, talent quality, and national competitiveness, which gives course aims a clear social and developmental orientation.

Within this strategic framing, developing analytical skills emerges as the most stable and widely shared purpose. The syllabus analysis indicates that this purpose appears in sixteen out of eighteen syllabuses, making it a highly prevalent goal statement. The scoping review similarly shows that studies of stand-alone critical thinking courses consistently foreground analytical training, defining it in terms of analysing information, evaluating evidence, and forming rational judgements. Importantly, these purposes are often organised hierarchically. critical thinking is not always presented as a self-contained educational end. Instead, it is commonly positioned as an enabling capability that strengthens the quality of analysis and judgement, thereby supporting the development of innovative capacity and responding to broader national goals of competitiveness and high-quality development. Put differently, the underlying logic of many course aim statements follows a familiar chain: critical thinking supports innovation, and innovation is treated as a key driver of national development and competitiveness.

Teaching content

In terms of content, Chinese critical thinking courses tend to be organised around logic and foundational argumentation. The syllabus analysis shows that critical thinking fundamentals and significance and argument analysis are close to standard components, with argument analysis appearing at a high rate and often paired with fallacy identification. Together, these elements form a combined package that links standards for evaluating argument structure

with training in recognising common reasoning errors. This combination suggests that Chinese critical thinking teaching prioritises objects that can be defined and assessed with relative clarity, such as the structure of arguments, relations between reasons and conclusions, judgements of validity and strength, and criteria for identifying fallacy types. As a result, the content is convertible into teachable tasks and assessable exercises.

A more distinctive feature lies in the overlap between a logic-driven orientation and an emphasis on conceptual grounding. On the one hand, the syllabus analysis indicates that some courses equate analytical skill with formal logical competence, organising training through symbolic tools such as truth tables, syllogisms, and tests of validity. This logic pathway is often more procedural and more readily assessable, which makes it easier to establish comparatively explicit standards for teaching and evaluation. On the other hand, compared with some Western courses that move more quickly into applied cases, Chinese courses and studies often devote substantial space to explaining the conceptual foundations and educational significance of critical thinking. This content arrangement offers advantages, while also introducing potential limitations. Its strengths lie in providing stable teaching targets and explicit training procedures, particularly where symbolic tools allow argument evaluation to resemble rule-based checking and thus reduce subjectivity in assessment. However, from the perspective of transfer, if courses rely too heavily on formal logic as the main organising spine, critical thinking may be interpreted primarily as technical training in structural correctness. In that case, dimensions such as weighing evidence in complex situations, judging information quality, and forming defensible judgements under uncertainty may receive less explicit development within the visible course structure. This creates a space that still requires alignment with policy emphases on real-world problem orientation, innovation quality, and judgement in an information-intensive society.

Teaching methods

Regarding teaching methods, the texts reveal a pattern that requires careful interpretation. Syllabuses generally provide limited detail about teaching methods. Even ‘active learning’ appears less prominently in syllabuses than key content themes, while collaborative learning, writing-based learning, and technology-enhanced learning are even less visible in syllabus

documents. The syllabus chapter cautions against equating low frequency with an absence of such practices in classrooms. A more plausible explanation is that writing conventions and template constraints lead syllabuses to under-report the practical details of classroom organisation. Many syllabuses prioritise topic sequences, reading schedules, and assessment components, but offer little explanation of how discussion is structured, how feedback is delivered, or how students repeatedly practise reasoning steps in class.

In contrast to the limited methodological detail in syllabuses, the scoping review suggests that critical thinking courses in China show stronger context-specific adaptation, with two practices especially illustrating responses to local classroom dynamics. The first is the use of technology to reduce authority pressure. Studies suggest that non-personalised feedback mechanisms enabled by AI or online platforms can, to some extent, ease students' reluctance to speak due to concerns about losing face or culturally embedded respect for authority. Such mechanisms can provide a relatively safe space for expressing disagreement and exposing errors, thereby directing attention back to reasoning processes and evidential standards. The second is the use of 'adversarial' or structured collaborative learning. For example, seminar designs that intentionally create cognitive tension, delay judgement, and juxtapose conflicting viewpoints, can counter tendencies towards rapid convergence, pushing students to form more independent judgements through comparison and challenge. The scoping review suggests that researchers attempt to address cultural constraints that may inhibit open critique in classroom settings. Rather than treating interaction as a simple increase in discussion frequency, these approaches seek to mitigate authority-related barriers and students' concerns about saving face, reducing reluctance to question or disagree, thereby creating conditions under which reasoning practice becomes feasible and sustainable.

10.4.2 The needs of critical thinking courses in Chinese universities

The needs of critical thinking courses in Chinese universities can be summarised around three structurally constraining factors.

From conceptual legitimation to executable training pathways

The first is the need for a clear and executable teaching framework that moves the curriculum

beyond ‘definitions and significance’ towards ‘how to teach’ and ‘how to transfer’ critical thinking. Many existing courses still concentrate on introducing concepts and justifying the value of the discipline. As a result, students may be able to restate what critical thinking is and why it matters, yet they lack a training pathway that can be practised repeatedly and carried into authentic contexts such as everyday argumentation, media judgement, public issues, academic reading and writing, and professional decision making in groups or committees. Although Chinese courses already show a strong emphasis on developing analytical ability and argument analysis, this emphasis needs to be specified further in the form of workable task chains and assessment criteria, so that activities such as identifying premises and conclusions, reconstructing arguments, evaluating evidence, responding to objections, and revising positions become routine units of course operation. A related problem is that some courses treat formal logic as the curricular backbone, organising teaching around deductive proof and symbolised reasoning. This orientation tends to shift learning towards rule manipulation and answer correctness, while weakening students’ capacity to handle features of real-world reasoning such as vague concepts, empirical evidence, probabilistic support, and value conflict. More importantly, informal logic and argument analysis were developed precisely to address the limitations of formal logic in natural-language and context-dependent reasoning. When a critical thinking course is instead built around formal logic, it often signals the absence of a mature teaching framework, and this in turn makes it difficult for the curriculum to develop a stable, transferable pathway for critical thinking training.

Addressing ‘high scores but low competence’

The ‘high scores but low competence’ phenomenon frequently discussed in Chinese higher education highlights the urgency of advancing critical thinking teaching in universities (Li, 2022). Cross-national assessments (Loyalka et al., 2021) reveal that Chinese university students enter higher education scoring on par with or above their international peers in foundational STEM knowledge and baseline critical thinking metrics. However, over the course of their four-year undergraduate trajectories, these students exhibit marked stagnation or even significant declines in advanced critical thinking and complex reasoning abilities (Loyalka et al., 2021). This gap is widely captured in Chinese academic discussion and

public discourse by the phrase ‘high scores but low competence,’ referring to students who perform strongly in standardised assessments but struggle to demonstrate stable capacities for independent judgement, argumentation, and adaptation to complex problems. As Chapter Nine shows, policy documents place ‘cultivating innovative talent’ at the centre, while repeatedly emphasising orientations such as independent thinking, logical reasoning, and information analysis, alongside calls to improve classroom pedagogy and to prioritise student development. These statements constitute a policy response to the ‘high scores but low competence’ phenomenon, recognising that knowledge acquisition and examination performance alone are insufficient to support the kinds of thinking required for complex decision-making and the enhancements in innovation capacities that this can facilitate.

A more plausible explanation of this paradox therefore lies in structural factors rather than individual student deficits. For a long time, university teaching in China has relied heavily on teacher-centred knowledge transmission and assessment systems oriented towards examinations. Classroom culture tends to reward the memorisation, comprehension, and rapid reproduction of authoritative knowledge. At the same time, mainstream assessment is often organised around pre-set answers, which encourages students to pursue finding the correct answer rather than articulating reasons and subjecting them to scrutiny. Under such incentive structures, even when students absorb knowledge efficiently, they may find it difficult to develop the ability chain that depends on sustained practice and feedback, such as stating reasons clearly, comparing conflicting evidence, and responding to objections. As a result, high scores do not automatically translate into stronger reasoning and judgement, even though such capacities form the cognitive foundation of the innovative ability, research capacity, and information-society adaptability emphasised in policy. From this perspective, policy calls for competence transformation and pedagogical reform can be understood as attempts to address and mitigate the structural consequences of ‘high scores but low competence.’ Critical thinking teaching offers an actionable curricular pathway that converts these ambitions into trainable and assessable learning processes.

Cultural alignment and sustainable classroom interaction

The third need is to align course design with China’s local cultural context and classroom

interaction norms. In some settings, Chinese learners may be shaped by Confucian relational ethics and collectivist modes of thinking, which place strong emphasis on maintaining group harmony and managing interpersonal standing. In everyday interaction, this can involve protecting one's public dignity and social credibility and avoiding situations that could cause embarrassment or visible loss of status in front of others. Within this context, ideas may be experienced as closely tied to the speaker's identity, so criticism of an argument can easily be interpreted as a judgement on the person who voiced it. The perceived risk of public embarrassment or status loss encourages students to remain silent, defer to the majority, or avoid open disagreement in class discussion. If debate is organised around adversarial win-lose dynamics, it may intensify anxiety and withdrawal rather than improve the quality of reasoning. A more workable direction is to adopt task structures that better fit local interaction expectations without sacrificing argumentative rigour.

10.5 A framework for critical thinking courses in Chinese higher education

Drawing on the comparative findings, this section proposes a stand-alone critical thinking course design intended to respond to the conditions of Chinese higher education. The central claim is that effective course design depends less on expanding topic coverage than on securing a teaching structure that is stable, assessable, and reproducible across teachers and departments. Accordingly, this section develops a coherent design chain. It first clarifies course positioning and boundaries, arguing that without an explicit core commitment and clear limits a course is likely to drift across adjacent agendas and lose a teaching line. It then specifies a spine-based architecture that aligns purpose, content, and method around repeated argument-analytical performances supported by active learning routines. Building on that spine, it proposes embedding strategies for three supplementary content areas that address predictable failure points in authentic reasoning, namely cognitive interference, interactional constraints in dialogue, and evidential judgement under uncertainty. Finally, it outlines an implementation and assessment plan that operationalises practice, feedback, and revision as routine course mechanisms, with grading criteria anchored in inspectable reasoning products. This framework should be read as a set of design recommendations rather than a validated intervention. It is informed by the implementation issues reported in the Western teacher survey and by structural features identified in selected Western syllabuses and textbooks,

interpreted alongside the Chinese research, syllabus, and policy evidence. The proposals therefore offer an evidence-informed structure for consideration and testing in Chinese higher education, rather than an arrangement already shown to be executable or effective across Chinese classrooms. However, the present study does not provide direct evidence that these specific arrangements will reliably improve student outcomes across institutions. Establishing effectiveness will require comparative evaluation, such as controlled or quasi-experimental designs that contrast alternative course structures, feedback and grading regimes, and interaction formats, using pre-post measures of analytical performance and transfer tasks.

10.5.1 Course positioning and boundaries

This section sets out principles for positioning and delimiting a stand-alone critical thinking course for Chinese higher education. Positioning and boundaries are not merely a matter of presenting a 'course description.' They are structural preconditions that determine whether a course can develop a stable teaching line, whether learning can be trained and assessed, and whether the course can be replicated across departments and teachers. Without a clear positioning, the course can drift across several plausible aims, ranging from conceptual introduction and elements of logic or writing to broader civic or innovation-oriented agendas. The outcome is often a collage of topics rather than capability training. By contrast, when the course specifies its core commitment and assessable targets from the outset, content, classroom activity, and assessment design can be organised around a single training chain, thereby improving operability and sustainability.

In terms of positioning, the core function of a critical thinking course is to teach students to make defensible decisions in natural-language and real information environments. The course's central commitment is not to equip students with a set of abstract definitions, nor to provide disciplinary knowledge supplements. It is skills-based, enabling students to perform a reproducible set of reasoning actions under conditions of uncertainty, dispersed evidence, and conflicting viewpoints. These actions include identifying premises and conclusions, reconstructing arguments, evaluating arguments (premise acceptability and inferential strength), formulating and responding to objections, and revising positions considering new

evidence and counterarguments. Positioning the course as improving the quality of decision making has two advantages. First, it connects directly with the policy analysis presented in Chapter Nine. That chapter showed that, even where the term critical thinking is rarely used explicitly, policy documents consistently emphasise capacities such as independent thinking, logical reasoning, information processing and in-depth analysis, as well as a broader shift from knowledge acquisition alone towards competence and literacy development. Framing the course around reasoned decision making translates these policy priorities into a concrete curricular purpose rather than leaving them as broad macro-level goals. Second, it provides clearly assessable targets, allowing teaching to be built around visible learning products and helping to prevent a disconnect between stated aims and evaluation.

With respect to boundaries, three common forms of structural drift require avoidance. First, the course should not be treated as equivalent to a formal logic course. The instrumental value of formal logic should be acknowledged, but it should not serve as the curricular backbone. As discussed above, the course should prioritise natural-language argument and evidence evaluation, with formal logic retained as a supporting tool. Second, the course should not be framed solely as an academic development or writing-skills module. Written and oral expression needs to be incorporated into assessment because it is the primary way that reasoning is externalised and made assessable, but expression is not an independent end. Requirements for expression should consistently be tied to argument quality, such as whether concepts are defined clearly, whether inferential structure is coherent and whether objections are represented faithfully and addressed adequately. Third, the course should not expand into civic education or macro-level innovation education oriented toward specific value stances. Public issues and innovation-related problems can function as case materials that provide authentic contexts and clear transfer opportunities for argument training. However, the course itself should maintain a neutral evaluative framework. What is assessed is the quality of reasoning and evidence handling, rather than particular positions, attitudes, or action orientations. Elevating ‘civic engagement,’ ‘innovation consciousness,’ or ‘creativity’ to core course commitments often reduces assessment transparency and encourages boundary expansion, thereby undermining the formation of a stable and replicable training pathway.

On the basis of these positioning and boundary principles, a stand-alone critical thinking course can adopt a ‘spine plus transfer’ structure. Internally, the course should treat argument

analysis as the procedural spine and organise teaching and assessment around a reproducible chain of analytical tasks. These core skills are themselves aligned with policy expectations, because they aim to cultivate stronger reason-giving, improved communication and dialogue, and better decision making. Alignment with policy expectations can then be further reinforced through case selection and transfer assignments. For example, materials can be drawn from science and technology controversies, public policy debates, media information, academic reading and writing, and discipline-relevant scenarios, so that students practise making informed judgements while completing the sequence of identification, reconstruction, evaluation, objection handling, and revision. Such an arrangement can respond to macro-level demands for capability development and innovative talent cultivation, while preserving curricular discipline and operability, thus providing a clear boundary foundation for the delivery structure and assessment design proposed in the sections that follow.

10.5.2 A spine-based course structure (Purpose-Content-Method)

In developing stand-alone critical thinking courses in Chinese higher education, the key issue is not to expand topical coverage, but to establish a course spine that is repeatable, assessable, and transferable. What characterises ‘mature’ Western courses is not that they include more content, but that they organise teaching as a stable learning chain: the teaching purpose is formulated as an operable capability commitment; the core content is proceduralised argument analysis; and the primary method is active learning, through which skill development is embedded in continuous cycles of practice, feedback, and revision. Adopting this structure in the Chinese context does not entail copying particular textbooks or classroom formats. It requires translating the underlying organising logic into an executable course architecture, so that the course does not remain at the level of conceptual proclamation or knowledge delivery.

At the level of purpose, the course spine should be specified as the assessable development of analytical capability in the service of improved decision making across a wide range of contexts. The course therefore needs to translate ‘critical thinking’ from an abstract label into demonstrable reasoning skills and to write those skills into learning outcomes and grading

criteria. In this chapter, that purpose is operationalised as five classes of skills. First, students should be able to identify conclusions, premises, and key assumptions in natural-language materials, and distinguish arguments from explanations and descriptions. Second, they should be able to reconstruct arguments by organising dispersed information into a clear support structure and making implicit premises explicit so that the inferential chain becomes assessable. Third, they should be able to evaluate evidence and inferential strength, for example by assessing the acceptability, relevance, and sufficiency of premises, and by articulating where and why the support for a conclusion is weak. Fourth, they should be able to formulate and respond to objections, representing the strongest counter-considerations faithfully and testing their impact on the conclusion. Fifth, they should be able to revise their positions considering new evidence or counterarguments, demonstrating the revisability of commitments and the coherence of reasons. A purposeful structure of this kind aligns course promises naturally with classroom tasks, and it allows 'capability development' to be accumulated through visible products.

At the level of content, argument analysis is suitable as the core content of a stand-alone course because it can be broken down into teachable steps, and because other content strands can be incorporated functionally into the same workflow, thereby creating a stable curricular backbone. A replicable content sequence can be organised into five stages. Stage one focuses on argument identification and concept clarification, teaching students to locate claims and reasons in texts and discourse, and to manage definitions, ambiguity, and conceptual boundaries. Stage two focuses on argument reconstruction, teaching students to translate natural-language arguments into explicit inferential structures, including skills such as distinguishing convergent from linked support and making implicit premises and conclusions explicit. Stage three focuses on evaluation, teaching students to judge evidence quality and support strength against explicit criteria, such as the acceptability, relevance, and sufficiency of premises, and positioning fallacy identification as a diagnostic resource within evaluation rather than as an isolated checklist to be memorised. Stage four focuses on objection handling and revision, teaching students to formulate the strongest counterarguments, to make warranted concessions, and to adjust positions, so that revision becomes a routine procedure. Stage five focuses on transfer by applying the same procedural

chain to longer, more contextualised materials and authentic information environments. It draws on extended cases from science and technology controversies, media information, public policy debates, academic reading and writing, and discipline-relevant scenarios, so that students learn to sustain analysis when arguments are embedded in background assumptions, competing evidence, and real-world constraints. Organised in this way, the course avoids a 'teach a little of everything' structure and instead regulates weekly teaching and workload around a developing, integrated and repeatable procedural main line.

At the level of method, the course needs to adopt active learning as its operating mechanism, so that argument analysis is not merely knowledge that has been covered, but a form of classroom work that students repeatedly perform such that it becomes a skill. In this context, active learning does not simply mean increasing the frequency of discussion. It requires classroom time to be organised around visible reasoning products, with capability development made cumulative through sustained feedback and revision. Practically, the course should establish a stable classroom rhythm. For example, a routinised active-learning cycle might involve short input and teacher modelling to introduce tools and standards, followed by small tasks that require students to produce visible reasoning artefacts, peer and teacher feedback to diagnose defects, and revision submissions to consolidate gains. Within this rhythm, oral discussion, writing tasks, collaborative learning, and technological tools should be treated as formats for practice rather than as separate method labels. Oral activities matter because they force students to externalise reasons in real time, respond to challenges, and adjust their formulations. Writing matters because it produces assessable argument texts and evaluation reports, making inferential chains traceable. Peer review matters because it institutionalises objection and revision, normalising critique as critique of arguments rather than critique of persons. Technology can extend and sustain repeated practice, including through online submission, anonymous peer review, and argument-mapping tools, as discussed earlier in the chapter.

Accordingly, the core of a spine-based structure lies in the directional alignment of purpose, content, and method: the purpose frames the course as improving the quality of judgement and decision making across contexts, and operationalises this aim in assessable analytical

performances. The content centres on the procedural chain of argument analysis, and the method embeds that chain in repeated cycles of practice, feedback, and revision. Such alignment not only provides a clear main line of teaching within the course, but also supplies a stable anchoring point for the supplementary content and the China-specific adaptation strategies developed in later sections. It shifts the course from the question of 'what is taught' to 'what students can do, and how this can be demonstrated.'

10.5.3 Embedding strategies for three supplementary content areas

Once a spine-based course structure is established, supplementary content is still needed to address three common constraint conditions in real-world reasoning: psychology content (memory, heuristics and cognitive biases, and emotions); the rules and skills of constructive dialogues; and evidence weighing under uncertainty. The function of supplementary content is not to expand the course's topical 'territory,' but to improve the effectiveness and transferability of spine-based learning in authentic contexts. To prevent the course from reverting to a parallel, topic-by-topic 'patchwork,' supplementary components should be embedded into the spine rather than taught as stand-alone units alongside it. The basic principle of embedding is functional specification. Each content needs to answer three questions explicitly: which failure points in spine-based teaching it addresses, at which stage of the argument-analysis chain it intervenes, and through what assessable tasks it is taught. Drawing on evidence from the textbook analysis and the practice-oriented accounts in the teacher survey data, this section proposes embedding strategies for three content: psychology, constructive dialogue, and probability.

10.5.3.1 Psychology

Psychology content has a functional role: it helps explain why students may still make mistakes even when the procedural steps of argument analysis are clear, and it offers practical techniques for making those steps more reliable in practice.

The first psychology component concerns memory, especially the limits of working memory. Working memory refers to the mental space in which information is temporarily held and actively manipulated during a task. In argument analysis, this limitation becomes important

because students are often required to track multiple parts of an argument at once: conclusions, premises, qualifiers, objections, responses, and their inferential relations. Spine-based teaching may specify that students should reconstruct arguments clearly, but a common failure point is that they cannot hold the relevant structure steadily enough in mind while reading or listening. This is especially likely when arguments are extended, interrupted, or distributed across multiple sentences and paragraphs. A student may identify an early qualification and then forget it later; may lose track of which reason supports which conclusion; or may confuse the main line of support with a counterargument introduced halfway through the text. The problem here is not necessarily that the student does not understand what reconstruction is, but that the reconstruction task places too much burden on internal memory.

For this reason, psychology content on memory should be embedded primarily at the reconstruction stage of the argument-analysis chain, though it also supports later evaluation. Halpern's discussion of external memory aids is especially useful here. External memory aids are deliberately arranged tools or cues that help a person remember and organise information that would otherwise have to be retained internally (Halpern, 2013, pp. 103-104, 110-111). In everyday life, these may include notes, alarms, calendars, or objects placed in visible locations to trigger recall (Halpern, 2013, pp. 103–104). In critical thinking teaching, the same principle can be applied to argument reconstruction. Students should be taught not to treat diagrams, tables, numbering systems, or mapping tools merely as final presentation devices, but as supports used during the analytic process itself. When students identify a conclusion, they can place it immediately in a fixed box or line. When they identify a reason, they can number it and link it straight away to the relevant claim. When a qualifier appears, they can attach it immediately to the claim it limits rather than trying to remember it for later. When a counterargument or response emerges, it can be externalised as a separate node, column, or layer in the map. In this way, reconstruction becomes not only a matter of recognising argumentative structure, but also a matter of managing information through external support. This use of external supports is consistent with Halpern's account of external memory aids as deliberate devices that reduce the burden placed on internal memory and support prospective remembering (Halpern, 2013, pp. 103-104, 110-111).

To make this component assessable, memory support should be taught through tasks in which students must demonstrate not only the final reconstructed argument, but also the process by which they stabilise that reconstruction. For example, students can be given a dense passage and asked to submit a partially completed argument map showing where they placed the main conclusion, premises, qualifiers, and objections as they read. They may also be asked to compare two reconstructions of the same text, one relying only on prose summary and one using a structured external aid, and to explain which version better preserves inferential relations. In classroom practice, teachers can model reconstruction live by showing how a text is converted step by step into an external representation. Students can then complete short reconstruction tasks individually or in pairs, receive feedback on misplaced or omitted elements, and revise the structure accordingly. Assessment criteria can include whether all major claims have been captured, whether support relations are correctly represented, whether qualifications and objections are retained, and whether the final representation is clear enough to support later evaluation. The point is not to test memory in isolation, but to teach students how to reduce memory-related failure in analytic work.

The second psychology component concerns heuristics and cognitive biases, which address a different source of errors. Even when students successfully reconstruct an argument, they may still judge it poorly because human judgement is not neutral or fully transparent to itself. In Stuart Hanscomb's teaching design, heuristics and biases are introduced within a broader account of rationality rather than as a loose list of psychological terms (Hanscomb, 2023, pp. 30-31). This account draws on Kahneman's distinction between System 1 and System 2 thinking, according to which System 1 is fast, intuitive, and low-effort, whereas System 2 is slower, more deliberate, and more effortful (Kahneman, 2011, p. 204; Hanscomb, 2023, pp. 30-31). A heuristic is a quick rule of thumb used to make decisions under conditions of limited time, information, or energy (Hanscomb, 2023, pp. 30-31). Heuristics are therefore not simply foolish mistakes. They are normal cognitive tools that people use because real life rarely allows complete analysis of every issue. However, because heuristics are selective, they can also mislead. A cognitive bias is a systematic tendency for judgement to be distorted in a predictable way, for example by giving too much weight to supporting evidence and too little to disconfirming evidence (Hanscomb, 2023, pp. 30-31). Hanscomb's important

pedagogical point is that critical thinking education should not merely tell students to avoid intuition. It should help them understand how intuitive judgement works, where it becomes vulnerable to distortion, and how it can be corrected or improved (Hanscomb, 2023, pp. 30-31).

This content should be embedded mainly at the evaluation, objection, and revision stages of the argument-analysis chain. A common failure point at the evaluation stage is that students assess arguments in a one-sided way. They may favour reasons that fit their prior beliefs, overlook contrary evidence, or treat familiar framings as neutral descriptions of reality. Confirmation bias, discussed above, is especially important here because evaluation is supposed to test whether reasons provide acceptable, relevant, and sufficient support for a conclusion. Yet students may never seriously test the conclusion if they attend only to material that confirms what they already believe.

Another important example is framing, which refers to the way an issue is presented or interpreted so that some features are highlighted while others are downplayed (Hanscomb, 2023, pp. 46-47). Different labels or descriptions can lead people to understand the same situation very differently. Hanscomb's examples show that framing is not just something used in propaganda or persuasion; it is also built into ordinary cognition, because human beings always attend selectively (Hanscomb, 2023, pp. 46-47). A further example is groupthink and related forms of social influence. This failure point is especially relevant to collaborative learning, since students may suppress doubt, treat silence as agreement, or fail to test alternatives because they do not want to appear difficult or uninformed (Hanscomb, 2023, pp. 44-46). As Aikin and Clanton (2010) likewise note, the quality of group deliberation depends in part on whether participants are willing to question apparent consensus and subject shared views to critical scrutiny.

The teaching of heuristics and biases can therefore be embedded as a set of highly relevant metacognitive checks within the spine. Metacognition means awareness and monitoring of one's own thinking. During evaluation, students can be taught to pause and ask questions such as: Am I looking only for evidence that supports my current view? Do I know what

kind of evidence would count against my conclusion? Am I accepting this reason because it is genuinely strong, or because it comes from a source I instinctively trust? Has the wording of the issue shaped my reaction before I have analysed the support? During objection and revision, they can be trained to generate alternative framings, search actively for disconfirming evidence, and compare rival positions before deciding whether their initial judgement should be maintained. This helps move the course beyond the simple message 'be unbiased,' which is too vague to teach, toward specific cognitive procedures that students can actually perform (Hanscomb, 2023, pp. 30-31, 46-47).

This component becomes assessable when students are required to demonstrate diagnostic, reflective, and corrective use of the material. One type of task is diagnostic practice, in which students analyse an argument, advertisement, political statement, or everyday judgement and identify which heuristic, bias, or framing device may be influencing the reasoning. Another is metacognitive reflection, in which students examine their own likely vulnerabilities. For example, they may be asked to describe situations in which they are especially prone to authority bias, confirmation bias, or social conformity, and then to explain how those tendencies might affect their evaluation of evidence. A third is corrective practice, in which students must apply bias-reduction strategies directly to an argument task. They may be required to list what evidence would count against their current view, generate the strongest alternative interpretation of the issue, compare two differently framed versions of the same case, or show how their judgement changes after searching for counterevidence. In assessment terms, students should not only name a bias correctly, but also show that they can use this recognition to improve evaluation and revision. Criteria may therefore include accuracy of diagnosis, relevance of the identified bias to the case, quality of the corrective strategy proposed, and evidence that the student's revised judgement responds to a broader evidential base rather than merely restating an initial preference.

The third psychology component concerns emotion, which addresses yet another failure point in spine-based teaching. A course may specify clear criteria for evaluating arguments, but students do not apply those criteria under emotionally neutral conditions. They may feel defensiveness when their own view is challenged, irritation toward a speaker, or excitement

when a conclusion fits their hopes. These emotional states can influence whether they engage carefully, rush to closure, avoid counterevidence, or refuse revision. The relevance of emotion here is not that argument evaluation becomes emotional instead of rational, but that emotional conditions affect whether rational standards are applied well. Research on self-regulated learning increasingly treats emotion as part of the learning process rather than as an external distraction (Ben-Eliyahu & Linnenbrink-Garcia, 2013; Zheng et al., 2023). In this context, emotion regulation means recognising one's emotional state, judging whether it is helping or hindering the task, and selecting an appropriate strategy to manage it (Ben-Eliyahu & Linnenbrink-Garcia, 2013; Zheng et al., 2023).

Emotion content should therefore be embedded primarily at the evaluation, objection, and revision stages, with some relevance to transfer tasks where issues are more personally or socially charged. The error point it addresses is not misunderstanding the criteria of evaluation, but failing to apply them steadily because one is anxious, angry, overly confident, averse to conflict, or reluctant to reconsider a prior commitment. Students may, for instance, dismiss a counterargument too quickly because it threatens a valued position, or avoid engaging with a controversial case because it produces discomfort. To address this, the course can build short emotion-monitoring routines into evaluative tasks. Before or during evaluation, students can be taught to pause and ask: What emotion is strongest right now? Is it pushing me to decide too quickly, to avoid the issue, or to overstate my confidence? Do I need to slow down, reread the text, map the argument structure, or postpone judgement until I have checked the evidence more carefully? The distinctive contribution of this material is that it does not change the standards of good argument evaluation; rather, it helps students regulate the conditions under which those standards are used (Hanscomb, 2023, pp. 68–70; Ben-Eliyahu & Linnenbrink-Garcia, 2013; Zheng et al., 2023).

To make emotion content assessable, students need tasks in which the effects of emotion on judgement are addressed through ordinary reasoning procedures rather than through personal disclosure alone. For example, before evaluating a contentious article, students can record an initial reaction and then be required to identify the strongest opposing reason, distinguish emotionally loaded framing from description, and compare their first response with their

final judgement after completing an argument map. In discussion-based activities, assessment can focus on whether students remain engaged with counterevidence, ask clarificatory questions, and modify their claims when reasons warrant it, especially in moments of disagreement or discomfort. In this way, emotion enters assessment not as a matter of reporting private feelings, but through students' ability to recognise when affect may be distorting judgement and to use procedures that keep reasoning on track. This is also more compatible with contexts in which saving face matters, since students are not required to make public admissions of emotional bias or personal error.

10.5.3.2 Constructive dialogue

Within a critical thinking course, the evaluative dimension of argument analysis extends beyond individual judgement. When students are required to evaluate arguments in discussion, this process also takes the form of objection and revision. Constructive dialogue is introduced here to support that stage of the course spine by helping students move from individual evaluation to objection and revision in interaction.

This difficulty is especially important in the Chinese classroom context, where students may hesitate to challenge others directly because questioning can risk embarrassment, social discomfort, or the appearance of disrespect. Under such conditions, objection and revision may remain underdeveloped not because students lack critical capacity, but because open critique carries a relatively high interactional cost. Constructive dialogue addresses this problem by giving disagreement a more socially manageable form, so that students can practise challenge, response, and revision without the exchange collapsing into silence or defensiveness.

To make this stage teachable, dialogue needs a clearer procedural structure than informal classroom discussion usually provides. If students are merely told to 'discuss' or 'debate,' expectations may remain unclear. At this point, the present proposal can draw on Walton's account of dialogue. Students cannot be expected to participate well if they do not know what kind of dialogue they are entering, what its purpose is, and what they are supposed to do within it. This is important because Walton does not treat dialogue as a single uniform

activity. Rather, he identifies different types of dialogue, each shaped by a different initial situation and directed toward a different goal (Walton, 2019, p. 198). A persuasion dialogue, for example, differs from deliberation or negotiation dialogue: its point is not simply to defeat an opponent or reach a compromise, but to test whether a claim can be adequately supported and whether objections require revision (Walton, 2019, pp. 198, 200-201, 210-212). For this reason, the opening stage should clarify which type of dialogue is being used and why it is appropriate for the present task. It should also establish the shared goal of the exchange, identify the participants and their respective roles, and, where necessary, set the burden of proof, that is, the standard a position must meet in order to count as sufficiently supported (Walton, 2019, pp. 198, 200, 210-212). In classroom practice, this means that students should know in advance whether they are expected to defend a claim, question a claim, audit evidence, or revise a claim, and what counts as successful performance in each role.

The argumentation stage is the main body of the dialogue, in which participants make moves within the agreed framework. Here, a student may present a claim and its supporting reasons; another may ask for clarification, identify an implicit assumption, test the relevance or sufficiency of evidence, raise a counterexample, or formulate an objection. The presenter is then required to respond, either by defending the original claim, qualifying it, narrowing it, or revising it in light of the criticism. What matters pedagogically is that these moves are not left vague. Students need to know that argumentation in dialogue does not mean speaking at length or repeating a prior opinion, but taking part in a sequence of reason-giving, questioning, objection, and response through which the strength of a claim is tested (Walton, 2019, pp. 198, 210-212).

The closing stage begins when the participants have reached a point at which the current round of testing can be assessed. It does not require full agreement, but it does require some judgement about what has been established through the exchange. For example, the dialogue may close when the presenter has answered the main objections, when a claim has been revised into a more defensible form, when a key weakness remains unresolved, or when the participants can state clearly what still needs further evidence or discussion. In classroom

terms, the closing stage should therefore ask students to identify the outcome of the discussion: whether the original claim was maintained, qualified, revised, or left undecided, and why. In this way, the dialogue ends not simply when speaking stops, but when the participants can account for what the exchange has achieved. Together, these stages suggest that objection and revision can be taught as a structured sequence rather than left as unregulated talk (Walton, 2019, p. 200).

A second requirement is that constructive dialogue be designed with attention to group conditions, because objection and revision do not take place only between isolated individuals but within a shared social setting. Properly organised dialogue can improve judgement by exposing students to alternative reasons, testing unsupported assumptions, and making revision more likely than in solitary reflection. A useful comparison can be found in evidenced benefits of deliberative public engagement, where structured two-way discussion often proceeds through phases of learning, deliberation, and decision-making in pursuit of a shared goal (Lancaster University, 2022).

However, such benefits should not be assumed automatically. As Aikin and Clanton (2010) argue, group deliberation can sometimes produce better epistemic results than solitary inquiry, but only under appropriate conditions. Without those conditions, group reasoning may be distorted by conformity, poor leadership, groupthink, or group polarization. Groupthink refers to the tendency of a group to suppress criticism or alternatives in the interest of harmony or apparent agreement, making decisions vulnerable to, among other things, group polarization - the tendency for group discussion to move participants toward more extreme positions. These risks are directly relevant here, because poorly designed discussion may create the appearance of engagement while actually reducing the quality of judgement (Aikin & Clanton, 2010).

These group conditions are not sustained by structure alone, because productive disagreement also depends on the habits and self-regulation that participants bring to the exchange. Constructive dialogue therefore provides a practical setting for cultivating critical thinking dispositions in interaction. In this respect, its value lies both in structuring objection

and revision and in creating opportunities for dispositions such as humility, courage, and temperance to be developed through use (Hanscomb, 2023, pp. 90-91). Humility helps students recognise that their present view may be incomplete or mistaken. Courage helps them raise or face criticism when doing so is uncomfortable. Temperance helps regulate the emotional impulses that may otherwise lead students to dominate, retaliate, or close discussion prematurely, and thus connects directly with the earlier discussion of emotion regulation in critical thinking. These dispositions matter because the success of objection and revision depends not only on what students know, but also on whether they can sustain disagreement productively.

To make constructive dialogue assessable, it could be taught through tasks in which students are required to perform objection and revision as observable interactional work. One effective format is a role-rotating discussion task. In such a task, students are assigned distinct roles so that the dialogue does not rely on vague or uneven participation. For example, one student may serve as the position presenter, whose responsibility is to state and defend a claim clearly. Another may act as the questioner, whose task is to ask focused questions about reasons, assumptions, or evidence. A third may act as the evidence auditor, who checks whether the reasons offered are relevant, adequate, and properly supported. A fourth may act as the reviser, whose task is to state how the claim should be modified in light of the discussion. Roles can then rotate across activities so that all students practise each part of the objection–revision process rather than remaining in a single comfort zone.

Within such a format, dialogue should proceed through prescribed moves that make expectations explicit. A useful sequence might begin with accurate restatement, in which the questioner or auditor first restates the presenter's position in their own words in order to confirm understanding. This reduces the risk of superficial disagreement or misrepresentation (and thus straw man arguments). The discussion may then move to targeted questioning, in which the presenter is asked to clarify reasons, definitions, evidence, or inferential links. A third move involves objection, where a participant identifies a potential weakness, alternative interpretation, counterexample, missing premise, or evidential gap. A fourth move involves revision, where the original presenter responds by defending,

qualifying, narrowing, or altering the initial claim.

These dialogic tasks can then be linked directly to assessment criteria derived from the requirements of constructive dialogue, including the accuracy of restatement, the specificity of questioning, the relevance and strength of objection, the quality of evidence checking, and the adequacy of revision (Hanscomb, 2023, pp. 90–91). Accuracy of restatement asks whether the student has understood the other position fairly rather than caricaturing it, which reflects the requirement to listen carefully to, and avoid misrepresenting, others' views (Hanscomb, 2023, p. 91). Specificity of questioning asks whether the student's questions target actual weaknesses in reasons, evidence, or assumptions rather than remaining vague or rhetorical, which is consistent with the expectation that discussants should be prepared to clarify their views and provide reasons for them (Hanscomb, 2023, p. 91). The relevance and strength of objection and the adequacy of revision extend these dialogical requirements into assessment by asking whether challenges genuinely test a position and whether reformulations respond meaningfully to criticism rather than merely repeating the original claim. Through assessment of this kind, dialogue becomes visible as a performance of reasoning rather than as a matter of personality or confidence (Hanscomb, 2023, pp. 90-91; Walton, 2008, pp. 17–18).

10.5.3.3 Probability

The probability content extends the evaluative skills of argument analysis under uncertainty and risk, enabling students to express and compare degrees of evidential support rather than relying on binary right-wrong judgements. Deductive validity remains necessary, but it is not sufficient, because the premises also need to be acceptable and, in many real contexts, key premises are probabilistic rather than certain. In such cases, evaluation turns on what is more likely, what level of risk is acceptable, and the extent to which incomplete evidence supports a conclusion. Without basic probabilistic representation, students may treat subjective confidence as evidential weight, treat isolated facts as decisive proof, or neglect the effects of base rates and conditional information on conclusions. The probability content should function as a conceptual toolkit for evaluation, embedded directly into the evidence weighing-conclusion revision step. Accordingly, probability here mainly comprises three

elements: conditional probability, Bayesian updating, and expected value. Their purpose is to help students understand differences in the degree of evidential support, the dynamic revision of judgement when new evidence emerges, and the weighing of risk and consequences in action choice (Bezanilla et al., 2019; Bellaera et al., 2021; Van Damme & Zahner, 2022).

First, conditional probability emphasises that the probability of one event can change once a certain condition has already been satisfied (Batanero et al., 2016). To take a simple example from playing cards, if one card is drawn at random from a standard deck, the probability of drawing a heart is one quarter; but if it is already known that the card drawn is red, then the probability that it is a heart becomes one half. In a critical thinking course, the significance of this concept lies in helping students understand that the strength of evidential support is not fixed, but always depends on specific conditions and background information. Argument analysis can certainly help students identify reasons and conclusions, but conditional probability further requires them to ask: to what extent does the same piece of evidence support a conclusion under different conditions? Which background information alters what initially appears to be a natural judgement? Why do some arguments seem persuasive on the surface, yet overstate the weight of evidence because relevant conditions have been ignored? Research on probability education indicates that learners often rely on intuition and surface features when dealing with probability problems, rather than attending spontaneously to conditional structure and background information (Batanero et al., 2016).

In terms of teaching content, the conditional probability component should focus on three issues. First, evidential support is conditional rather than absolute. Second, background information changes the meaning of the same item of evidence. Third, intuitive judgement is often unreliable in probability contexts. The birthday paradox can serve as an important classroom case for this section. Students might first be asked to judge whether, in a class of 60 students, the probability that at least two share the same birthday is high. Many students would underestimate this probability, although the actual figure is already approximately 0.994. The value of the case lies not mainly in the calculation itself, but in showing students how easily plausible first impressions can mislead when probability is at issue. As Kahneman

suggests, people often respond to probability questions through intuitions that feel convincing because they fit a familiar pattern, rather than through careful statistical reasoning; in this way, judgements are drawn towards representativeness and away from the actual conditions that should govern the estimate (Kahneman, 2011, pp. 148–149). He further shows that such intuitions often involve neglect of relevant base-rate information, even when that information is crucial to sound judgement (Kahneman, 2011, pp. 149-150). Critical thinking courses therefore should not only teach students to analyse argumentative structure, but also help them recognise when their first response in conditions of uncertainty may need to be checked and revised. In pedagogical terms, this content can be taught through a sequence in which students first make an intuitive judgement, then test it analytically, and finally reflect on why their original estimate seemed persuasive but proved unreliable. The card example can first be used to establish the basic idea that changes in conditions alter probabilistic judgement, after which the birthday paradox can lead students through the experience of moving from common-sense estimation to revised understanding. In class, students may first write down their estimates, then explain their reasoning in small groups, and finally reflect collectively on why intuition diverged from the result. Higher education research has already supported the value of using cases, discussion, reflection, and contextualised tasks to implement critical thinking teaching in this way (Bezanilla et al., 2019; Bellaera et al., 2021). In assessment terms, this section should not rely primarily on pure calculation questions, but should instead focus on whether students understand how conditions alter judgement. A more appropriate approach would be to design short case analyses or brief in-class written tasks requiring students first to record their intuitive judgement, then explain which background conditions affect the result, and why their original intuition may have been unreliable. Marking criteria should include whether relevant conditions have been identified, whether students can explain how changes in condition alter evidential support, and whether they can reflect on their initial judgement. Such assessment is more consistent with the critical thinking principle of treating the thinking process itself as an object of assessment, rather than regarding the correct answer as the sole standard (Bellaera et al., 2021; Van Damme & Zahner, 2022).

Second, Bayesian updating emphasises that once an initial judgement has been formed,

confidence in that judgement should be revised as new evidence appears. Research on the teaching of Bayesian reasoning commonly understands it as updating an original hypothesis or judgement in light of new evidence (Hoffrage et al., 2015; Steib et al., 2025). What it teaches, therefore, is a way of thinking that involves dynamic judgement revision: students learn to modify their original judgement in response to new evidence, rather than treating their first impression as a fixed conclusion.

The Bayesian updating component can be organised through everyday weather risk assessment. For example, the teacher may present a situation in which, during the rainy season in a particular area, the proportion of days on which heavy rain actually occurs is 30%, and this forms the basis for students' initial judgement about whether it will rain heavily today. The teacher may then introduce a new piece of evidence, such as a weather forecast showing a heavy rainfall warning, and explain that such a warning appears on 80% of the days that do in fact end in heavy rain, but also on 25% of the days that do not. Students can then be asked to estimate the probability that heavy rain will actually occur given that the warning has been issued, and to explain the basis of their judgement. The teaching can proceed in the following stages. First, students are asked to make an initial judgement on the basis that it is currently the rainy season, and to explain why they consider the rain risk high or low, thereby making their intuitive judgement visible. Second, they are guided to identify two kinds of key information relevant to that judgement: one is the base rate, namely the proportion of days in the rainy season that actually involve heavy rain; the other is the discriminative power of the new evidence, namely the probability that a heavy rainfall warning appears on days with heavy rain and on days without it. Third, students are required to combine these two kinds of information in their analysis. Although a heavy rainfall warning significantly raises concern about the risk of heavy rain, the warning does not determine the conclusion by itself, because some days without heavy rain will also carry a similar warning. Students may therefore be required to revise their judgement as further evidence is introduced. What matters pedagogically is not merely the numerical result, but the process by which students learn to update an initial judgement in light of new evidence. A teaching design of this kind illustrates more clearly the connection between Bayesian updating and critical thinking pedagogy: students must form an initial judgement in an

uncertain situation, identify key evidence, compare the weight of that evidence, revise their original conclusion, and reflect on the limits of their judgement. Research also shows that the use of natural frequencies and appropriate visual representations can improve performance in this kind of Bayesian reasoning (Hoffrage et al., 2015). In assessment terms, the Bayesian updating component is best suited to staged tasks rather than a single final answer. Students might be required to record how their judgement changes each time a new piece of evidence is added, and to explain the main reason for each change. Alternatively, this could be designed as coursework or an examination question in which students are given a prior probability and a new item of evidence, and asked to estimate the posterior probability and explain how the prior information and the new evidence jointly affect the conclusion. Marking criteria should not focus only on numerical correctness, but also on whether students can distinguish between base rates and new evidence, explain why judgement strengthens or weakens, and state the limitations of the current conclusion. More advanced assessment may also ask students to examine the assumptions of the problem critically, for instance by considering whether warning accuracy is stable, whether the base rate varies by season, or whether the model itself would need to be adjusted if further evidence were added. This kind of assessment design is consistent with findings from current research on Bayesian reasoning pedagogy, which emphasises that what matters is not merely arriving at an answer, but being able to organise information appropriately and revise judgement on that basis (Büchter et al., 2022; Hoffrage et al., 2015).

Finally, expected value addresses the movement in a critical thinking course from judging whether a claim is reasonable to deciding how to choose among multiple possible actions. Expected value may be defined as the average anticipated outcome obtained by weighting each possible result of a course of action by the probability of its occurrence (Batanero et al., 2016). Its significance does not lie in predicting what will happen in any single instance, but in helping one judge what gains or losses a choice is more likely to bring overall. For example, if one option has a 10% probability of producing a gain of 100, and a 90% probability of producing nothing at all, then its expected value is 10. This does not mean that each instance will produce 10, but rather that, in long-run average terms, the option is equivalent to yielding 10 per occasion. Research on decision-making under risk and

uncertainty indicates that people's judgements in such contexts are often not naturally stable, and that it is valuable to teach students to explicitly consider both probabilistic information and consequences, rather than allowing them to be guided solely by the attraction or threat of a single outcome (Cokely et al., 2012). The importance of expected value in a critical thinking course, then, lies in shifting students' attention from an isolated outcome to the overall consequence structure, thereby supporting more mature decision-making.

In terms of teaching content, the expected value component should help students understand that decisions cannot focus only on the most salient outcome, but must consider both the probabilities and the consequences of all relevant outcomes; that low-probability but high-loss situations may still deserve serious consideration; that highly attractive outcomes may not be worthwhile overall; and that rational decision-making is not a matter of pursuing absolute safety, but of weighing risk, benefit, and cost more carefully. The question of whether to purchase an extended warranty provides a suitable classroom case. Suppose that an item can be covered by an additional warranty costing £80, while a serious fault outside the standard warranty would require £500 in repair costs. If the probability of such a fault during the extended warranty period is only 10%, then the expected repair cost without purchasing the warranty is only £50, whereas purchasing the warranty leads to a worse average outcome. The pedagogical value of this case is that it clearly shows how people in decision-making often overestimate the impact of low-probability but high-loss events, while failing to consider probability and consequence together. The teacher may first ask students to judge intuitively whether the warranty should be purchased, and to explain their reasoning, before guiding them to analyse the issue by combining the size of the loss with its probability, and then discussing why intuition tends to overvalue the reassurance offered by the warranty. Such a design is consistent with current research on critical thinking and higher education pedagogy, which suggests that more effective teaching often uses cases, reflection, argument, and contextualised assessment to move students from abstract judgement towards practical decision-making (Bezanilla et al., 2019; Van Damme & Zahner, 2022).

In assessment terms, the expected value component is well suited to contextualised decision

tasks. Students may be given an everyday-life scenario involving several options and asked to explain the possible outcomes of each option, the probability of those outcomes, the associated gains or losses, and then to make and justify a decision. Marking criteria should include whether the main options and consequences have been identified, whether probability and consequence have genuinely been analysed together rather than attention being restricted to a single high-gain or high-loss result, whether a clear rationale is provided for the final choice, and whether students recognise that their decision still depends on certain assumptions. In examinations, more explicit marking criteria could be used, such as ‘correct identification of options, outcomes, and probabilities’, ‘reasonable comparison of expected consequences’, ‘clear explanation of the final recommendation and its justification’, and ‘recognition of the limitations of the judgement’. In this way, assessment moves beyond whether students can produce a number, and instead examines whether they can transform numerical analysis into prudent practical judgement, which is precisely one of the aims of critical thinking education (Van Damme & Zahner, 2022).

Taken together, these three components are related to argument analysis, but they do not simply attach probability concepts to it. Conditional probability helps students grasp the conditional nature of evidential support and reflect on the limitations of intuitive judgement; Bayesian updating helps them revise their position dynamically when new evidence appears, rather than remaining at the level of static judgement; and expected value helps them move from evaluating claims to comparing options, weighing risks, and making decisions. In this way, probability becomes an important supplement to critical thinking teaching: it not only helps students analyse reasons, but also enables them to understand evidence more carefully, revise judgements more openly, and act more reasonably in an uncertain world.

In sum, the embedding of these three supplementary content areas follows a single structural principle: the course should not expand by adding parallel topics but should extend functionally to enhance the spine’s effectiveness. The psychology content addresses internal interference in the execution of argument analysis, making meta-cognition and open-mindedness teachable skills or dispositions. The constructive dialogue content translates evaluative standards into interactional procedures, enabling objection and revision to occur

as repeatable, low-risk routines in classroom interaction. It also has wider value beyond the classroom, since many professional and civic decisions are made collectively rather than individually, and therefore require participants to raise objections, respond to criticism, and revise provisional judgements in a constructive way. The probability content provides tools for expressing and updating evidential support under uncertainty, making evidence weighing and conclusion revision more consistent with authentic decision environments. By embedding these contents at key points of the argument-analysis chain, the course can expand transfer while keeping the spine clear, thereby offering a clearer and more workable implementation pathway for critical thinking content in Chinese higher education that is teachable, assessable, and replicable.

10.6 Chapter summary

This chapter has identified a recurrent course structure in the Western evidence, centred on analytical-skill development, argument analysis, and active learning. It has also argued that this structure is most defensibly understood as a bounded and assessable course spine, rather than a loose accumulation of parallel aims or topics. This reconstruction provides the comparative and conceptual basis for the Chinese course design proposed in this chapter.

At the same time, however, the Chinese evidence displays a different orientation and a clearer set of constraints. Policy texts foreground innovation and talent cultivation, with critical thinking usually embedded within broader capability discourse. Chinese research and syllabuses increasingly emphasise analysis and argumentation, but often with less stable course boundaries and less explicit operational routines. On this basis, the chapter distilled three design needs in the Chinese context: shifting from conceptual legitimation to executable teaching pathways; addressing the ‘high scores but low competence’ tension through practice-feedback-revision mechanisms; and designing classroom interaction so that critique and revision remain culturally and socially sustainable.

Building on these findings, the chapter proposed an evidence-informed course blueprint for Chinese higher education. The model adopts a spine plus transfer structure: a stable spine of argument-analytical performances (identification, reconstruction, evaluation, objection

handling, and revision) enacted through active-learning routines that generate inspectable reasoning products and cumulative revision traces. Three supplementary content areas are embedded into the spine as functional extensions that address failure points in authentic reasoning (cognitive interference, interactional constraints, and uncertainty-based evidence judgement). The result is a design that aligns policy-relevant aspirations primarily through case selection and transfer tasks while preserving curricular discipline through assessable performance standards.

The chapter's contribution is an evidence-informed design for teaching critical thinking in Chinese higher education rather than a validated intervention, and its limits should be understood accordingly. First, the multi-source datasets differ in genre and visibility. Syllabuses often under-report classroom routines; textbooks formalise teachable procedures but do not directly represent local enactment; teacher survey accounts provide feasibility insights but cannot cover institutional variation. The criteria-based framework mitigates these constraints by privileging cross-source convergence and operability, yet some implementation features necessarily remain inferential rather than directly observed. Second, the proposed model is evidence-informed, but its effectiveness has not yet been empirically established. The chapter does not claim that a spine-based architecture will automatically produce superior outcomes across all institutions. Its claim is narrower and design-oriented: the reconstructed Western pattern offers a plausible logic for making critical thinking more teachable and assessable, and the Chinese adaptation strategies respond to predictable constraint conditions identified in the Chinese evidence. Establishing effectiveness requires iterative testing in context.

Conclusion

The concluding chapter proceeds in five parts. It begins with a section titled Responses to the Research Questions, which returns to the three research questions and presents the main conclusions drawn from Chapters Three to Ten. It then discusses the contributions of the study, including its theoretical, empirical, and practical value. The chapter next considers the limitations of the research and the scope within which its conclusions should be interpreted, before outlining directions for future research arising from both the findings and the limitations of the study. Finally, it offers concluding remarks on the implications of the combined evidence for stand-alone critical thinking course design in Chinese higher education.

11.1 Responses to the research questions

This study was guided by three research questions. First, what are the teaching purposes, content, and methods of critical thinking teaching in Western and Chinese higher education? Second, what are the similarities and differences between the critical thinking teaching purposes, content, and methods in Western and Chinese higher education? Third, which aspects of Western approaches to critical thinking teaching may support the further development of critical thinking teaching in Chinese higher education? Drawing on the findings presented in Chapters Three to Ten, this section addresses each of these questions in turn.

11.1.1 Teaching purposes, content, and methods in Western and Chinese higher education

The findings show that, in Western higher education, critical thinking teaching is mainly characterised by a recurring combination of analytical purposes, argument-based content, and active learning and teaching methods. In terms of teaching purposes, the most prominent aim is the development of analytical skills. Other purposes, such as enhanced learning, better decision making, the development of critical thinking dispositions, and effective communication, also appear frequently, but they are usually positioned as aims pursued through analytical training rather than as separate central purposes. In terms of teaching

content, argument analysis forms the main focus. This commonly includes defining arguments, identifying arguments, reconstructing arguments, classifying arguments, and evaluating arguments. Other themes, such as Fallacies, Academic development, Dialogue and Communication as Content, Probability, and Psychology, are also present, but they are usually organised around argument analysis rather than treated as parallel cores. In terms of teaching methods, active learning is the most prominent pattern. This is typically supported by oral learning, written learning, collaborative learning, and technology-enhanced learning, through activities such as discussion, writing tasks, peer review, workshops, online exercises, and argument-mapping.

The Chinese materials included in this study suggest a somewhat different pattern. In terms of teaching purposes, the most prominent aim is also the development of analytical skills, and better decision making, enhanced learning, the development of critical thinking dispositions, and effective communication also appear quite frequently in the Chinese sample. At the same time, these purposes are more often situated within broader educational and national aims, including national development, the cultivation of innovative talent, educational strengthening, and scientific and technological advancement. In terms of teaching content, the most prominent themes in the Chinese syllabuses are the foundations and importance of critical thinking, argument analysis, and fallacies. These patterns suggest a relatively strong emphasis on conceptual grounding, the clarification of basic frameworks, and logical reasoning, and in some cases, formal logic appears to play an important organising role in the course. In terms of teaching methods, active learning is highly visible in the Chinese research literature, but less fully articulated in the syllabuses themselves. Oral learning, written learning, collaborative learning, and technology-enhanced learning are all present in the Chinese sample, but they appear much less frequently in syllabuses and are often described only briefly. On this basis, the Chinese evidence suggests not a lack of interest in critical thinking teaching, but a weaker level of clarity about what the core content of a critical thinking course should be and how that content should be organised into a coherent teaching structure. This is precisely why the framework proposed in this thesis matters: it provides a clearer way of defining, organising, and operationalising critical thinking content for Chinese higher education.

11.1.2 Similarities and differences between Western and Chinese critical thinking teaching

The findings suggest several important areas of convergence between Western and Chinese critical thinking teaching. Most obviously, both place analytical ability at the centre of the course. Second, both attach considerable importance to argument and reasoning as course content. Although the way this content is organised varies, argument identification, argument reconstruction, argument evaluation, and fallacies all occupy an important place in both contexts. Third, both recognise that critical thinking should not remain at the level of conceptual knowledge alone, but should also connect to skills development and practical judgement.

At the same time, the two contexts differ in several important respects. First, they differ in course positioning. Western course design tends to focus on how students analyse reasons, evaluate evidence, respond to objections, and revise their judgements. By contrast, the Chinese materials analysed here more often place critical thinking within broader policy narratives concerning the cultivation of innovative talent, national competitiveness, and the transformation of higher education. Although this framing strengthens the policy relevance of the course, it may also pull course content in multiple directions, making the overall organisation more diffuse and the central line of the course less clear.

Second, the two contexts differ in how content is organised. One of the more developed features of Western courses is that they do not simply list a series of important themes, but instead establish an organising axis centred on argument analysis, with other elements positioned in relation to that core. By contrast, the Chinese materials more often combine emphasis on the foundations and importance of critical thinking, the teaching of logic, and fallacy identification, and in some cases treat formal logic as the main framework. This gives the Chinese sample a stronger tendency towards conceptual grounding and rule-oriented teaching, whereas the Western sample places greater emphasis on procedural analysis and evaluation of argumentation as found in professional, civic, and other natural language contexts.

Third, the two contexts appear to differ in practices of classroom interaction. Chinese higher education has long been shaped by traditions of teacher authority, one-way knowledge transmission, and assessment practices that prioritise arriving at a predetermined correct answer over articulating, defending, and revising reasons. Such structures are less conducive to sustained student practice in articulating reasons, responding to disagreements, and revising positions. In addition, in some classroom contexts, concern for harmony, relationships, and saving face may increase the interactional cost of public questioning and direct criticism. Western courses, by contrast, are more likely to treat discussion, critique, rebuttal, and revision as a normal part of learning.

11.1.3 The relevance of Western critical thinking courses for the development of related courses in Chinese higher education

The findings suggest that the value of Western critical thinking courses for Chinese higher education lies less in any particular topic taken on its own than in their more developed curricular logic. What is most relevant is not the direct transfer of Western course contents, but the way mature courses define a coherent teaching core, organise learning around it, and connect it to assessable performance. The following discussion therefore identifies which features of that course logic may inform stand-alone critical thinking course design in Chinese higher education.

First, the Western materials analysed in this study indicate that different areas of content are more workable when organised in relation to a central axis rather than accumulated as loosely connected topics. In more mature Western courses, fallacies, academic expression, dialogue, probability, biases, and heuristics do not function as parallel topics, but contribute to different stages within the chain of argument analysis. This is particularly relevant to Chinese higher education, because it suggests that course development should not be understood simply as expanding the range of topics covered. A more productive approach would be to clarify which elements form the core teaching, which serve as supporting resources, which function as application contexts, and which operate as extension content. Such an approach could help prevent the course from becoming broader in coverage while weaker in internal coherence.

Second, the comparative evidence suggests the importance of distinguishing between themes that can function as course cores and those better treated as broader outcomes or application domains. This study found that creativity, civic engagement, and Problem Solving, although educationally valuable, show less stability across the four Western datasets and often remain at the level of higher-order aims, without a clear and stable pathway for teaching and assessment. To elevate such themes into the curricular backbone may therefore reduce clarity, weaken consistency, and blur assessment criteria. This point is especially relevant in the Chinese policy context, where innovation is strongly foregrounded and critical thinking courses may be expected to straightforwardly produce 'innovative outcomes'. The Western evidence suggests that a more workable approach is not to require critical thinking courses to generate innovation directly, but to train and assess the forms of judgement that make innovation more robust, such as analysing arguments, weighing evidence, handling objections, and revising positions.

Third, the Western materials also highlight the curricular significance of active learning in making critical thinking practice visible, revisable, and assessable. Discussion, peer review, workshops, online exercises, and scenario-based tasks are not simply forms of pedagogical variety, but work together to help students externalise their reasoning, receive feedback, and revise their responses over time. For Chinese higher education, this suggests that critical thinking teaching is unlikely to develop fully if discussion is simply added to an otherwise traditional lecture model. Rather, interaction, practice, feedback, and revision need to be built into the teaching and assessment structure so that they become routine, low-risk, and sustainable classroom activities. This also offers a potentially valuable way of translating broad policy expectations into teachable and assessable classroom processes, by turning general capability claims into repeated and observable performances.

Finally, the study suggests that any borrowing from Western experience must be carefully reorganised within the Chinese context. Because Chinese higher education is shaped by the combined influence of innovation-oriented policy, teacher-centred traditions, and norms of assessment and classroom interaction, Western course models cannot simply be transferred wholesale. The value of Western experience lies not in providing a fixed template to be

copied, but in offering principles that may help clarify how critical thinking courses in Chinese higher education could move from broad educational aspirations towards more sustainable classroom practice under local institutional and cultural conditions.

11.2 Contributions of the study

The value of this study lies in identifying, analysing, and evaluating features of critical thinking teaching in Western and Chinese higher education, and in providing, through cross-source comparative analysis, an interpretive framework for understanding the structure, boundaries, and possible directions of development of critical thinking courses. Its contribution lies mainly in three areas: advancing theoretical understanding of critical thinking courses, extending the empirical evidence base across Western and Chinese materials, and offering a curricular perspective that helps explain how critical thinking may become teachable while also informing course development in Chinese higher education.

First, at the theoretical level, this study offers a more structural perspective on research into critical thinking courses. Although previous scholarship has long discussed the definitions and components of critical thinking, it provides less systematic explanation of how critical thinking courses are actually organised at the teaching level. One important contribution of this study is to show that, in Western stand-alone critical thinking courses, teaching purposes, content, and methods are related to one another in relatively clear ways. In particular, the development of analytical skills, the central place of argument analysis, and the use of active learning are not simply three isolated high-frequency themes, but are better understood as parts of a mutually supporting course structure. This helps shift attention from the question of what a course includes to the question of how a course forms a core and maintains coherence, and in doing so offers a more concrete curricular explanation for theoretical discussion of critical thinking courses.

Second, at the empirical level, this study strengthens the evidence base for research on critical thinking teaching by drawing together multiple forms of material from both Western and Chinese contexts, including syllabuses, textbooks, course documents, teaching practice, and policy texts. This allows the study not only to ground its account of Western critical

thinking courses in a broader body of evidence, but also to move discussion of the Chinese context beyond abstract policy statements or individual course cases. Although the Chinese materials are limited in scope, they still provide valuable preliminary evidence of some of the tendencies reflected in the aims, content arrangements, and methods in Chinese higher education critical thinking courses. The value of this evidence lies not in drawing definitive conclusions about the overall Chinese situation, but in providing a more informed starting point for future research, and in identifying issues that merit further empirical examination.

Third, this study offers a new curricular perspective on how critical thinking may become teachable in Chinese higher education, while also providing a more practical basis for course development under local policy and institutional conditions. In the broader academic and policy context, the importance of critical thinking is now widely recognised, yet there remains a clear gap between broad educational aims and concrete course mechanisms. In the Chinese context in particular, critical thinking is often incorporated into larger narratives of innovative talent cultivation, educational modernisation, and high-quality development, but there is still insufficient clarity about how such aims can be translated into teaching mechanisms that are clear and assessable within the course itself. The significance of this study lies in bringing that issue back to the curricular level. It suggests that the development of critical thinking courses depends not only on whether the aims are recognised in policy, but also on whether the course forms a clear central line, whether its content has structural coherence, and whether classroom activities can reliably support students' learning. In the longer term, the study also offers a relatively workable mediating path for thinking about critical thinking courses in a context where innovation and capability development are both emphasised. Rather than treating innovative output itself as the direct product of the course, it suggests that courses may contribute more effectively by strengthening students' ability to analyse arguments, evaluate evidence, respond to objections, and revise their judgements, thereby improving the quality of thinking in complex situations.

11.3 Limitations of the study

This study has several limitations that should be acknowledged. First, one limitation lies in the uneven scope of the Western and Chinese evidence bases. The evidence used to

reconstruct the Western course logic draws on selected Western syllabuses, textbooks, and teacher survey data, interpreted alongside the broader international scoping review. By contrast, the Chinese evidence base is more limited in scale and relies more heavily on published research, syllabuses, and policy texts. Coverage of Chinese-language research was also constrained by the absence of institutional access to CNKI, as explained in Chapter Two. As a result, the Western findings provide a stronger basis for identifying recurring patterns across different forms of evidence, whereas the Chinese findings need to be interpreted more cautiously. In particular, the Chinese materials analysed in this study are better understood as indicating some tendencies and possible directions of development than as supporting strong claims about the overall state of critical thinking teaching across Chinese higher education as a whole. This unevenness is particularly relevant to the textbook component, which was confined to Western materials. The study therefore does not make direct claims about similarities or differences between Western and Chinese textbooks. Textbook-derived findings are used to elaborate the Western course logic that subsequently informs the course-oriented synthesis, rather than as evidence of textbook-level differences between the two contexts. Future analysis of Chinese textbooks would require context-sensitive inclusion criteria, and Section 11.4 accordingly includes them among the materials to be examined in future research.

Second, the study relies substantially on documentary and text-based materials. Syllabuses, textbooks, research articles, and policy texts are valuable sources for understanding how courses are framed, structured, and justified, but they do not provide direct access to what happens in classrooms in all cases. There may be important differences between what course documents state, what teachers actually do, and what students experience in practice. This is especially relevant in relation to teaching methods. For example, where syllabuses give only brief descriptions of classroom activities, it is difficult to know how far active learning, discussion, peer interaction, or revision-based tasks are actually implemented. The findings should therefore be read primarily as an analysis of curricular representation and stated teaching design, rather than as a full account of enacted pedagogy.

Third, the comparative design of the study necessarily involves a degree of abstraction. In

order to compare a wide range of materials across Western and Chinese contexts, the analysis organises the data around the shared categories of teaching purposes, content, and methods. This makes systematic comparison possible, but it also reduces some of the local complexity of individual courses, institutions, and national settings. In particular, the category 'Western' covers materials drawn from a range of different countries, institutions, and educational traditions, and should not be understood as representing a single uniform model. Likewise, the Chinese materials included in the study do not capture the full diversity of institutions, regions, disciplines, or local teaching conditions within China. The comparison presented here is therefore best understood as an analytical comparison of selected bodies of material rather than as a complete mapping of all variation within either context.

Fourth, some of the source types used in the study have different functions and levels of specificity, which also places limits on interpretation. Policy documents, for example, operate at a broad strategic level, while syllabuses are more directly curricular, textbooks are pedagogically structured, and teacher survey responses reflect practitioner perspectives shaped by local conditions. Bringing these materials together makes it possible to develop a broader account of critical thinking teaching, but it also means that the findings depend partly on interpretation across sources that do not speak in the same register. For this reason, the study cannot assume that patterns identified across source types are identical in meaning or function. Rather, they should be understood as convergences that require careful interpretation.

Fifth, the teacher survey evidence has its own limitations. Survey responses can offer useful insight into how teachers describe aims, content, and classroom practice, but they remain self-reported accounts. Such accounts may emphasise some aspects of teaching while leaving others under-described, and they may not always correspond fully to what would be observed in classrooms. In addition, the number of teacher responses was limited, and the survey was confined to four Western countries. No interviews or questionnaires were conducted with Chinese teachers because the necessary governmental approvals and access permissions could not be secured by an individual researcher. The survey evidence should therefore be treated as illustrative rather than representative and does not provide direct

evidence of Chinese teachers' enacted practice.

These limitations have implications for the scope of the conclusions. The study is well placed to identify broad patterns, structural tendencies, and areas of contrast across the materials analysed, especially on the Western side. It is less well placed to make strong claims about frequency or prevalence beyond the sample, about the full diversity of practice within Chinese higher education, or about how far stated course designs are realised in everyday teaching. The conclusions should therefore be applied with greater confidence to questions of curricular structure and comparative orientation than to claims about classroom effectiveness or system-wide national practice.

11.4 Directions for future research

Based on the findings and limitations of this study, future research could be developed in several directions to deepen understanding of critical thinking teaching in higher education and provide a stronger evidence base for course development.

First, future research needs to expand the empirical base within the Chinese context. Although this study has included Chinese research literature, syllabuses, and policy texts, the Chinese sample remains limited and is therefore better suited to indicating certain tendencies than to supporting strong claims about the overall situation. Future studies could collect critical thinking course materials on a wider scale across different regions, institution types, and disciplinary contexts, including syllabuses, textbooks, teaching plans, classroom tasks, assignment design, and assessment requirements. This would not only allow a fuller account of the diversity within Chinese higher education, but would also help test whether some of the tendencies identified in this study still hold across a broader sample.

Second, future research should pay greater attention to evidence at the level of classroom implementation. This study is based mainly on textual and documentary materials and is therefore better able to show how courses are described, designed, and justified than how they are actually enacted in teaching. Future research could draw on classroom observation, teacher interviews, student interviews, audio or video recordings of lessons, student work,

and assessment feedback in order to examine more directly how critical thinking teaching unfolds in practice. Particularly important questions include how teachers translate course aims into concrete activities, how students participate in argument analysis and response to objections, how active learning is organised under different classroom conditions, and what kinds of obstacles and supporting conditions shape classroom interaction. Research of this kind would help bridge the gap between course documents and actual teaching practice.

Third, future research could explore more directly the relationship between course design and learning outcomes. This study has focused mainly on the organisation of teaching purposes, content, and methods, but it has not directly tested the extent to which different forms of course design support the development of students' critical thinking. Future work could make use of pre- and post-course designs, analysis of student assignments, evaluation of classroom performance, measures of argument ability, and student reflective materials in order to investigate more concretely which teaching arrangements are more effective in supporting students' progress in identifying arguments, reconstructing arguments, evaluating evidence, responding to objections, and revising judgements. Compared with simply discussing what ought to be taught, such research would be better placed to address the question of which course designs are actually effective.

Fourth, future research should refine comparisons between different types of course. This study has focused mainly on stand-alone critical thinking courses, but critical thinking teaching does not exist only in stand-alone form; it may also be embedded in disciplinary or academic development courses. Future studies could compare stand-alone and embedded courses in terms of teaching aims, content organisation, classroom activities, and assessment mechanisms, and examine the strengths, limitations, and conditions of suitability associated with each form. This would support a fuller understanding of the different curricular routes through which critical thinking may be taught in higher education, rather than treating one course form as the only point of reference.

Finally, future research could build on this study by moving further into course development and practice-based validation. This study has proposed several principles relating to core

content, course organisation, and teaching methods, but the practical operability of these principles in actual curriculum development still needs to be tested through practice. Future research could therefore design and implement critical thinking course prototypes, observe how they function in real teaching contexts, and revise them in the light of student performance, teacher feedback, and course evaluation data.

11.5 Concluding remarks

This thesis has provided a conceptual and empirical foundation for further inquiry into critical thinking teaching in higher education. By analysing teaching purposes, content, and methods across Western and Chinese sources, and by drawing together evidence from scoping reviews, syllabuses, textbooks, teacher data, Chinese research literature, and policy texts, it has described, analysed, and evaluated how critical thinking is taught in different contexts. More importantly, it has identified a recurrent curricular logic in the Western evidence and examined its relevance in light of Chinese research, course syllabuses, and policy texts. This combined analysis informs the proposed framework for stand-alone critical thinking course design in Chinese higher education.

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Appendix

Associated research data and supplementary materials relevant to this thesis have been deposited separately in the University of Glasgow Enlighten Research Data repository. Repository access details and a list of files are provided below.

Repository access

DOI: 10.5525/gla.researchdata.2234

Link: http://dx.doi.org/10.5525/gla.researchdata.2234

File list and descriptions

The appendix materials include ethics documentation for the teacher survey, extraction tables from the international and Chinese scoping reviews, extraction tables for Western and Chinese course syllabuses, textbook analysis tables, extraction and coding tables for teacher survey responses, and policy analysis tables.

Appendix A. Teacher Survey Documentation

A1 Ethical Approval Letter.pdf

Ethical approval letter for the teacher survey study.

A2 Participant Information Sheet.pdf

Information sheet provided to participants before taking part in the survey.

A3 Consent Form.pdf

Consent form used for the teacher survey.

A4 Privacy Notice.pdf

Privacy notice explaining the handling and storage of participant data.

A5 Teacher Survey Questionnaire.pdf

Full questionnaire used in the teacher survey.

Appendix B. International Scoping Review Data Tables

B1 Summary Table of Included Studies.xlsx

Summary table of the studies included in the international scoping review.

B2 International Scoping Review Extraction Tables.xlsx

Extraction tables for teaching purposes, teaching content, and teaching methods in the international scoping review.

This workbook contains three separate worksheets:

- Teaching purposes
- Teaching content
- Teaching methods

Appendix C. Chinese Scoping Review Data Tables

C1 Summary Table of Included Studies.xlsx

Summary table of the studies included in the Chinese scoping review.

C2 Chinese Scoping Review Extraction Tables.xlsx

Extraction tables for teaching purposes, teaching content, and teaching methods in the Chinese scoping review.

This workbook contains three separate worksheets:

- Teaching purposes
- Teaching content
- Teaching methods

Appendix D. Western Critical Thinking Course Syllabus Analysis

D1 Overview of Western Courses.xlsx

Overview table of the Western critical thinking courses included in the syllabus analysis.

D2.1 Australian Course Syllabuses Extraction Tables.xlsx

This workbook contains thirteen worksheets, with one worksheet for each university.

D2.2 Canadian Course Syllabuses Extraction Tables.xlsx

This workbook contains ten worksheets, with one worksheet for each university.

D2.3 United Kingdom Course Syllabuses Extraction Tables.xlsx

This workbook contains seven worksheets, with one worksheet for each university.

D2.4 United States Course Syllabuses Extraction Tables.xlsx

This workbook contains fourteen worksheets, with one worksheet for each university.

Appendix E. Chinese Critical Thinking Course Syllabus Analysis

E1 Overview of Chinese Courses.xlsx

Overview table of the Chinese critical thinking courses included in the syllabus analysis.

E2 Chinese Course Syllabuses Extraction Tables.xlsx

This workbook contains eighteen worksheets, with one worksheet for each university.

E3 Source Texts of Chinese Course Syllabuses.pdf

Source texts of the Chinese course syllabuses included in the analysis.

Appendix F. Critical Thinking Textbook Analysis

F1 Critical Thinking Textbooks Extraction Tables.xlsx

This workbook contains twenty-two worksheets, with one worksheet for each textbook. The worksheets include both themes derived from the scoping review framework and additional themes identified through the textbook analysis.

Appendix G. Teacher Survey Response Analysis

G1 Teacher Survey Response Extraction and Coding Tables.xlsx

Extraction and coding tables for teaching purposes, content, methods, and challenges in teacher survey responses.

This workbook contains two worksheets:

- Themes derived from the scoping review framework
- New themes emerging from teacher survey responses

Appendix H. Chinese National Education Policy Analysis Tables

H1 Overview of Policy Documents.xlsx

Overview table of the policy documents included in the analysis.

H2 Policy Text Extraction and Coding Table.xlsx

Policy text extraction and coding table, including original extracts, translation results, initial codes, and final themes.