PIONEER
ACADEMIC PUBLISHING LIMITED

Journal of **Advanced Research** in Education

Volume 4, Number 6 **November 2025**

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PIONEER
ACADEMIC PUBLISHING LIMITED

Journal of Advanced Research in Education
ISSN 2709-3980
www.pioneerpublisher.com/jare
Volume 4 Number 6 November 2025

EFL Motivation of College Engineering Students in China in the Era of AI

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doi:10.56397/JARE.2025.11.01

Abstract

Based on Gardner's theory of L2 motivation and Dörnyei's L2 motivational self-system (L2 MSS model), this study, using the questionnaire survey method, investigates the English learning motivation of 76 freshmen majoring in engineering in China. The findings reveal that: (1) The English learning motivation of engineering students is dominated by instrumental motivation, with academic requirements (72.4%) and career development (68.4%) being the most prominent initial motivations; (2) Learning motivation shows a declining trend over time, with 63.2% of students reporting a decrease in enthusiasm, mainly attributed to the low relevance of course content to their major (average score 3.8/5) and the heavy workload of main courses (average score 4.1/5); (3) The use of AI tools shows the characteristic of "efficiency priority, efficacy in doubt", with 58% of students using AI to complete English homework weekly, but 64.5% believing that it has limited effect on improving language proficiency; (4) Students have a strong demand for teaching reform, especially expecting material related to their major (efficacy score 4.3/5) and personalized feedback (efficacy score 4.38/5). The research indicates that in the AI era, the EFL learning motivation of engineering students presents a complex situation of "strengthened instrumental rationality and weakened intrinsic motivation", which requires responses through curriculum integration, AI literacy cultivation, and the reconstruction of teacher-student relationships.

Keywords: EFL learning motivation, engineering students, artificial intelligence, instrumental motivation, college English teaching

1. Introduction

With the rapid advancement of generative artificial intelligence (Gen AI) technology, especially the increasing sophistication of large language models such as GPT-4 and GPT-5, and intelligent tools like DeepSeek, a fundamental transformation is taking place in the ecological environment of language learning (Li & Wu, 2025). In the realm of higher education, foreign language learning, particularly English learning, is confronted with unprecedented challenges and opportunities. Yang Lianrui (2024) noted that generative AI has exerted a profound influence on both the practice and theoretical research of foreign language learning.

For non-English major engineering students in China, English has long been regarded as a crucial instrument for accessing cutting-edge professional knowledge and engaging in international academic exchanges. However,

with Gen AI now capable of providing efficient and convenient translation and writing services, an urgent educational question arises: In an era where AI can offer such services, do engineering undergraduates still possess a strong intrinsic motivation to systematically learn and master English? Are the components of their learning motivation undergoing essential alterations?

This study zeroes in on the specific cohort of first-year engineering students in a second-tier engineering university in Jiangsu, China. Engineering freshmen are at a pivotal transitional period from basic English learning in high school to the application of academic English in university. Through preliminary classroom observations and informal teacher interviews, a prevalent phenomenon has emerged: At the commencement of the semester, freshmen typically exhibit a strong interest in College English, demonstrating high levels of classroom participation and enthusiasm for learning. Nevertheless, this positive state often proves short-lived. Approximately one month later, both the frequency of classroom interaction and students' learning engagement show a notable decline.

Does this phenomenon stem from a swift weakening of their English learning motivation? What are the specific types of their learning motivation (such as instrumental motivation, integrative motivation, etc.)? How do the intensity and persistence of these motivations impact their learning behaviors and academic performance? These questions form the core impetus of this study.

This research aims to delve into the following questions through empirical investigation, grounded in the educational landscape of the AI era and with first-year engineering students as the subjects of inquiry:

(1) What types of learning motivation primarily constitute the English learning motivation of first-year Chinese engineering students?

(2) Does their learning motivation undergo significant changes from the beginning of the semester to approximately one month later? If so, how?

(3) To what extent and in what ways does the popularization and application of Gen AI tools impact their English learning motivation?

2. Literature Review

2.1 Theoretical Framework of Second Language Learning Motivation

2.1.1 Classic Paradigms of Motivation Theory

Research on second language learning motivation traces its origins to the classic works of Gardner and Lambert. Gardner (1985), within the framework of his socio-educational model, clearly classified language learning motivation into two broad categories: "integrative motivation" and "instrumental motivation". Integrative motivation refers to learners' genuine interest in the culture and people of the target language community, accompanied by a desire to communicate with and integrate into it. In contrast, instrumental motivation is more utilitarian, oriented towards reaping practical benefits through language learning, such as passing exams, securing better jobs, or climbing career ladder. This dichotomy laid a solid foundation for subsequent decades of motivation research.

Subsequently, motivation theory has undergone continuous evolution and enrichment. Dörnyei (1994, 2005) extended Gardner's model, proposing a more dynamic and multidimensional "Second Language Motivational Self-System" (L2MSS). This system encompasses three dimensions: the Ideal L2 self, the Ought-to L2 Self, and L2 Learning Experience. It places greater emphasis on learners' projections of their future self-images and the influence of specific learning contexts on motivation. L2MSS model changed the way of understanding L2 learning's motivation by reinterpreting language learning motivation as "a form of self-development or self-realization" (Ryan & Dörnyei, 2013, p. 92).

In China, motivation theory has also been widely employed to explore English as a foreign language (EFL) learning. Gao Yihong et al. (2004) further introduced concepts such as "productive motivation", suggesting that the motivation of Chinese English learners may be multifaceted, dynamic, and subject to transformation. Zhang Hong and Du Xinran (2021) conducted a systematic study of college students' English learning motivation using the Q method and identified four primary types of motivation among them: future-oriented, failure-avoidant, self-developmental, and culturally interested. This classification has augmented the research paradigm of EFL motivation in the Chinese context, offering a novel perspective for comprehending the

complexity of students' learning motivation.

2.1.2 The Evolution of Motivation Theory in the Era of AI

In tandem with the changing landscape of second language learning, particularly the increasing penetration of technology, motivation theory has continued to develop. Ushioda (2011) suggested that in the context of globalization and the preeminence of English, traditional concepts like "integrative motivation" have lost some of their explanatory power to some extent. As English becomes an essential basic educational skill and the concept of a distinct target language community becomes less defined, second language motivation is being re-conceptualized from the vantage point of contemporary self and identity theory.

ElMajanini (2024)'s qualitative research underscored the key role of motivation in second language acquisition and highlighted the significant influence of classroom dynamics and teacher support on students' learning motivation. Bronfenbrenner's (1998) ecological systems theory suggests that teacher support, as an element within the micro-environment that directly impacts students' learning, is closely intertwined with their learning engagement.

2.2 Research on the Impact of AI Technology on L2 Learning Motivation

2.2.1 The Impetus of AI Technology on L2 Motivation

In recent years, research on the application of Gen AI in L2 learning has burgeoned. Jin et al. (2025) discovered through empirical research that the quality of students' academic writing improved and their writing motivation was strengthened after using Gen AI. Alrajhi et al. (2025) conducted a group-tracking study and found that, compared to online dictionaries, Google Assistant could significantly enhance students' L2 vocabulary acquisition. Shafiee Rad (2025) explored the facilitative effect of Gen AI on L2 reading comprehension. Huang & Mizumoto (2025) investigated the impact of using generative AI in EFL classrooms on the second language motivation self-system and found that the judicious use of AI tools could enhance students' ideal second language self and boost their learning motivation. Li & Wu (2025)'s systematic review of the use of generative AI tools in academic writing indicated that these tools could elevate writing quality, streamline writing processes, and cultivate self-regulated learning. These studies, from diverse perspectives, attest to the potential of Gen AI technology in enhancing the efficiency and effectiveness of second language learning.

2.2.2 The Potential Risks of AI Technology on L2 Motivation

Nonetheless, some scholars harbor reservations about the use of AI in L2 learning, criticizing its potential ethical implications, such as AI-assisted cheating. Zhang Hong and Du Xinran's (2021) research identified factors influencing English learning motivation, including teacher-related factors, learner characteristics, learning environment variables, family influences, and peer interactions. The intrusion of technology, they posited, may disrupt the equilibrium among these factors, thereby affecting learning motivation. Dang (2025)'s research directly confirmed this view. Dang found that after the implementation of AI in Vietnamese higher education classrooms, students not only became overly reliant on large language models but also demonstrated reduced critical thinking and collaborative skills during classroom activities.

Wu Heping and Wang Jing (2021) conducted a comprehensive review of three decades of research on instructed second language acquisition and identified that research on corrective feedback in classroom teaching and its specific manifestations (such as recasts, prompts, and questions) within the framework of cognitive psychology has been a focal point. This stands in interesting contrast to the automated feedback provided by AI technology, sparking inquiries into the potential disparities between AI and human teachers in providing feedback.

2.3 Research Gaps and Innovations

In summary, existing research in the intersection of AI technology and L2 learning motivation presents the following gaps:

(1) The majority of studies concentrate on the impact of AI on language learning outcomes, with relatively scant attention paid to its influence on learning motivation.

(2) There is little research targeting the specific group of engineering students, despite the fact that their English learning requirements differ significantly from those of non-engineering students.

(3) Empirical research on English learning

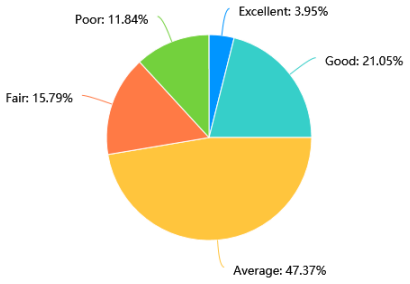
motivation as a foreign language in the AI era in China remains in its initial stage.

This study endeavors to address these research gaps by employing empirical investigation methods to explore the types, changes, and influencing factors of English learning motivation among engineering students in the AI era, thereby providing theoretical guidance and practical insights for related educational practices.

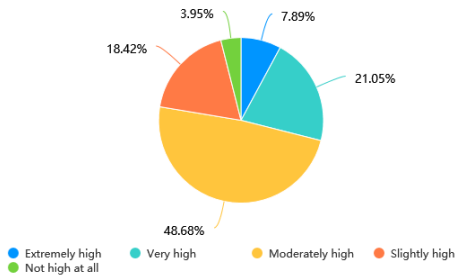
3. Research Design

3.1 Research Participants

This study utilized a questionnaire survey approach, targeting 76 first-year students from a second-tier engineering institution. Among them, 51.32% were male, 40.79% were female, and 7.89% did not disclose their gender information, indicating a relatively balanced gender distribution. As to their College Entrance Examination English scores, 56.58% of the participants scored within the range of 90 - 119, suggesting that the overall English proficiency of the sample was at a medium level. Additionally, 47.37% of the students self-assessed their English proficiency as "average" while 48.68% reporting moderate initial enthusiasm for learning College English, indicating a relatively rational distribution of representative samples.



Graph 1.



Graph 2.

3.2 Research Methods

This study adopts a mixed research approach with a quantitative focus and a qualitative supplement. Quantitative data was collected through a questionnaire survey to understand the basic situation, changing trends, and usage of AI tools of engineering students' English learning motivation. The questionnaire was designed based on Gardner's motivation theory framework and Zhang Hong's (2021) classification of motivation types, and was also combined with the usage of AI tools. The internal consistency reliability of the questionnaire, as measured by Cronbach's with α coefficient 0.87, indicating good reliability. Additionally, qualitative data was obtained through content analysis of the open-ended questions in the questionnaire survey, providing supplementary and explanatory information for the quantitative results, including students' suggestions for improving English teaching and other factors influencing their learning motivation.

3.3 Research Tools

This study utilized a self-designed "Engineering Students' College English Learning Motivation Questionnaire" based on Gardner's motivation theories. The questionnaire consists of the following sections:

(1) Basic information, including gender, college entrance examination English scores, self-assessed English proficiency, etc.;

(2) Measurement of learning motivation, including initial motivation types and changes in motivation intensity;

(3) Usage of AI tools, including frequency of use, reasons for use, and perception of the effectiveness of AI tools;

(4) Teaching preferences, including evaluations of the effectiveness of different teaching methods and the importance of teachers' qualities;

(5) Open-ended questions, including suggestions for improving English teaching and other factors influencing learning motivation.

3.4 Data Collection and Analysis

The questionnaire was compiled and distributed through the Wenjuanxing platform, and a total of 76 valid questionnaires were collected. Quantitative data was processed using SPSS 25.0 for descriptive statistics and correlation analysis,

etc. Qualitative data from the open-ended questions was analyzed by NVivo 12 through a three-level coding process of open coding, axial coding, and selective coding to extract core categories and relationships.

4. Research Results and Findings

4.1 Types and Intensity of Engineering Students' English Learning Motivation

The survey shows that the English learning motivation of engineering freshmen is clearly oriented towards instrumental purposes. Among the initial motivations, academic requirements (56.58%) and preparation for CET-4/6 exams (67.11%) ranked first and second, indicating that institutional and certification pressures dominate students' initial motivations. This is consistent with Gardner's (1985) instrumental motivation theory and also confirms the "self-development" motivation characteristics in Zhang Hong and Du Xinran's (2021) classification.

Table 1. Distribution of the Initial EFL learning Motivation Variables (Multiselect, N=76)

Motivation variables	Percentage	Typical Expression
Academic demand	56.58%	"pass the tests"; "graduation precondition"
CET-4/6	67.11%	"required to pass Cet4"; "for more job opportunities"
Career Prospect	68.42%	"foreign companies"; "read technical files"
Cultural Interest	23.68%	"be attracted to American and English culture"; "watch English TV series"
Others	5.26%	"pressure from parents"; "peer influence"

Further analysis reveals that the instrumental motivation of engineering students is characterized by a distinct pragmatism. In responses to open-ended questions, some students stated, "If AI translation is accurate enough, why spend so much time learning English? Unless it's for professional reading or going abroad." This statement reflects the utilitarian assessment of the value of English learning by students in the AI era, which is consistent with Ushioda's (2011) observation that English has become a "necessary skill" in a globalized context.

It is worth noting that although instrumental motivation is dominant, students' emotional attitudes towards English learning are not entirely negative. 42.11% of the students consider the current English learning atmosphere "neutral", and 36.84% think it is "relatively positive". This indicates that engineering students still maintain a basic emotional acceptance of English learning, providing a possible space for teaching intervention.

4.2 Dynamic Changes in Engineering Students' English Learning Motivation

The survey on changes in learning motivation shows that the English learning motivation of engineering students significantly declines over time since enrollment. 56.58% of the students reported that their enthusiasm for learning "has not changed", but the analysis of open-ended questions suggests that this "stability" more reflects a lack of enthusiasm for English learning rather than sustained passion.

Table 2. Engineering student's EFL Motivation Change and Reasons (N=76)

Change types	Percentage	Main reasons
increase	15.79%	"the teacher is interesting"; "content is practical"
Unchanged	56.58%	"nothing"; "the same as before"
decline	27.63%	"excessive burden of major courses"; "low relevance of course content to the major"

Among the factors that lead to a decline in learning enthusiasm, "excessive burden of major courses" (with an agreement rate of 3.11/5) and "low relevance of course content to the major" (with an agreement rate of 3.8/5) stand out the most. One student wrote in an open-ended

question: "There are always lab reports to write every week, and programming assignments as well. I really can't spare time to study English seriously and can only deal with it a little." This reflects the unique predicament faced by engineering students — the academic pressure from major courses has a significant "crowding-out effect" on English learning. This finding echoes Dörnyei's (2005) theory of the L2 motivation self-system. There is a clear gap between the "ought-to self" (such as passing exams and meeting graduation requirements) and the "ideal self" (such as becoming an international engineer) of engineering students, and the heavy workload of major courses further undermines the quality of the second language learning experience, leading to an overall imbalance in the motivation system.

4.3 The Relationship Between AI Tool Usage and English Learning Motivation of Engineering Students

4.3.1 Overview of AI Tool Usage

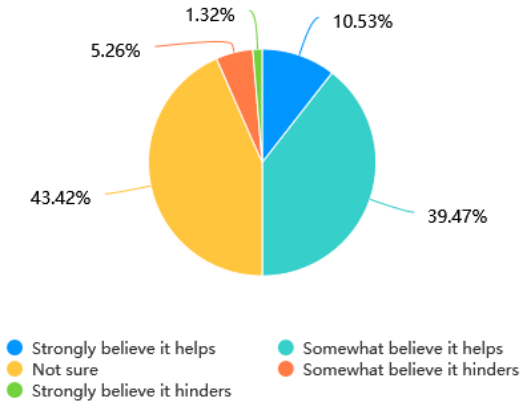
The survey shows that AI tools have become widespread in the English learning of engineering students. 58% of the students use AI tools to complete English homework every week, and 34.21% use them 1-2 times a month. Regarding the reasons for usage, 81.6% of the students choose "saving time", and 53.95% choose "improving the quality of homework", indicating that students mainly view the value of AI tools from the perspective of efficiency.

Table 3. AI Use Frequency and major Cause (N=76)

Frequency	Percentage	Major cause
everyday	11.84%	"to finish homework quickly"; "error checking"
1-2times/week	46.05%	"improve writing quality"; "save time"
1-2times/month	34.21%	"difficult problems"; "sometimes"
rarely	7.89%	"afraid of dependence"; "not allowed by the teacher"

4.3.2 Evaluation of the Effectiveness of AI Tools

Despite the frequent use of AI tools, students' assessment of their actual effectiveness tends to be conservative. 64.5% of the students believe that AI tools have a "limited" effect on improving their actual English proficiency, and 43.42% are "uncertain" whether AI has truly enhanced their English skills. This paradoxical phenomenon of "high usage rate but low sense of effectiveness" reveals the double-edged sword effect of AI tools in English learning.



Graph 3.

On the one hand, AI tools have indeed improved learning efficiency or work quality. As one student put it, "Using ChatGPT to revise my essay, I can get a text with perfect grammar and natural expression in an instant, which is much better than my own efforts for hours."

On the other hand, over-reliance on AI has brought potential risks to the development of abilities. Another student admitted, "Now whenever I encounter English writing, I habitually turn to AI, and I feel that my own expression ability has declined." This result echoes Dang (2025)'s finding that long-term use of AI tools may lead to a decline in students' critical thinking and collaborative abilities. At the same time, it also confirms the view in Li & Wu (2025)'s systematic review that while AI tools can improve writing efficiency, they may have a negative impact on the development of students' critical thinking and independent writing abilities.

4.4 Engineering Students' Expectations for English Teaching Reform

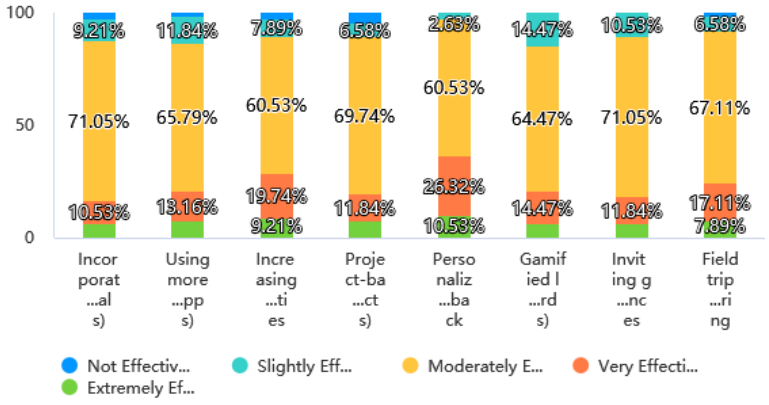
Facing the dual challenges of motivation decline and the impact of AI, engineering students have clear expectations for English teaching reform.

In the evaluation of the most effective teaching methods, "professional-related materials" (efficacy score 4.3/5) and "personalized feedback" (efficacy score 4.38/5) ranked first and second, while "gamification learning elements" (efficacy score 2.89/5) received the lowest evaluation.

Table 4. Efficacy Evaluation of Different Teaching Methods (1 = Completely ineffective, 5 = Extremely effective)

Teaching methods	Average score	Standard Deviation
Personalized feedback	4.38	0.72
professional-related materials	4.30	0.68
Inter-active study	4.10	0.75
Project-based learning	3.85	0.81
Gamification learning elements	2.89	0.92

In terms of teacher qualities, "approachable and supportive attitudes" (67.11%) and "the ability to integrate English application with professional background" (76.3%) are most valued by students, surpassing traditional evaluation indicators such as "proficient in professional knowledge" (42.1%). This reflects students' high expectations for teacher-student relationships and the practicality of teaching content. These findings are consistent with ElMajanini's (2024) qualitative research results, which indicate that teachers' emotional support and the appropriateness of teaching contexts are key factors in maintaining second language learning motivation. At the same time, they also confirm the viewpoint of Wu Heping and Wang Jing (2021) that second language classroom teaching should pay more attention to learners' cognitive mechanisms and emotional needs.



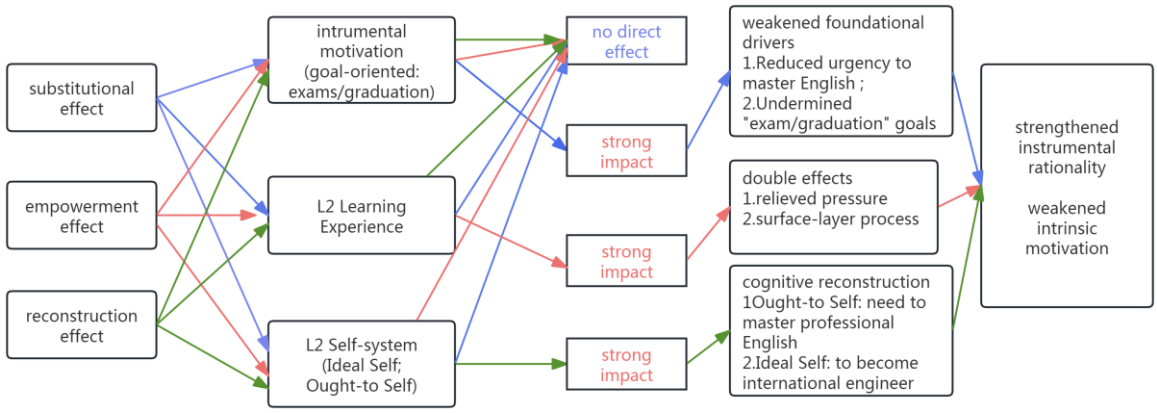
Graph 4.

5. Discussion

5.1 The Development Mechanism of EFL Motivation for Chinese Engineering Students in the AI Era

Based on the survey results, this study constructs a model of the development mechanism of EFL motivation for engineering students in the AI era (see Graph 5). In this model, AI technology, as a key environmental variable, influences engineering students' English learning motivation through three paths: the first is the substitution effect, where the possibility of AI tools substituting for traditional English abilities reduces the urgency of learning English; the second is the empowerment effect, where AI tools enhance the efficiency of English learning and to some extent alleviate learning pressure; the third is the reconstruction effect, where AI technology changes the value structure of English abilities,

making high-level language application abilities (such as technical communication and professional writing) more prominent.



Graph 5. (The Development Mechanism of EFL Motivation for Chinese Engineering Students in the AI Era)

Under this mechanism, the English learning motivation of engineering students presents a complex situation of "strengthened instrumental rationality and weakened intrinsic motivation". On the one hand, in the face of the substitution threat from AI technology, students more rationally assess the input-output ratio of English learning and tend to concentrate their limited learning resources on the most practical areas. On the other hand, the efficiency of AI tools reduces the need for students to deeply engage in the language learning process, thereby reducing the opportunities for the generation of intrinsic motivation. This mechanism can be interpreted from two theoretical perspectives: from Gardner's (1985) motivation theory, AI technology strengthens the utilitarian orientation of instrumental motivation while weakening the cultural interest dimension of integrative motivation; from Dörnyei's (2005) L2 Motivational Self System, AI technology may both enhance the "Ought-to L2 Self" (such as passing exams with AI assistance) and weaken the attractiveness of the "Ideal L2 Self" (such as becoming a proficient English user).

5.2 Implications for College English Teaching

5.2.1 Curriculum Content Reconstruction: Shift from General English to Professional English

The survey results show that engineering students have a strong preference for professional-related English materials (efficiency score 4.3/5), providing a clear direction for the reform of college English teaching. Traditional general English courses are difficult to meet the learning needs of engineering students in the AI era, and there is an urgent need to shift to English teaching based on professional contexts.

Specifically, College English teaching can be adjusted as follows: First, introduce authentic engineering materials such as technical documents, academic papers, and project reports to deeply integrate language learning with professional content; second, carry out project-based language learning, allowing students to develop language skills in professional projects mediated by English, such as writing English project proposals and giving technical presentations; third, strengthen academic English skills, focusing on cultivating students' reading, writing, and communication abilities in professional fields to enhance their English application skills in academic and professional scenarios. This curriculum reconstruction not only echoes the view of Wu Heping and Wang Jing (2021) that second language classroom teaching should pay more attention to the authenticity of language but also aligns with the concept of "contextualized language learning" proposed by ElMajanini (2024).

5.2.2 Integration of AI Literacy: Shift from Tool Use to Capability Development

In the face of the widespread use of AI tools, a simple ban is neither realistic nor wise. Instead, College English teaching should proactively integrate AI literacy education, guiding students

to shift from superficial tool use to in-depth capability development.

First, carry out metacognitive training for AI-assisted learning to help students clarify the appropriate role of AI in English learning, such as being a writing assistant rather than a writer, and a creativity stimulator rather than a substitute for thinking; second, design human-machine collaborative learning tasks, such as comparing the differences between AI and human translations, analyzing the language features of AI-generated texts, etc., to cultivate students' critical AI usage skills; third, establish academic norms for AI use, clearly defining the ethical boundaries of AI-assisted learning to prevent academic misconduct. These measures are consistent with the "responsible AI use" principle proposed by Li & Wu (2025) and also help address the problem of excessive reliance on AI pointed out by Dang (2025).

5.2.3 Reshaping the Teacher-Students Relationship: Expansion from Knowledge Transmission to Emotional Support

In the survey, "approachable and supportive attitude" (67.11%) was regarded by students as the most important teacher quality, suggesting that in the AI era, the role of teachers needs to expand from traditional knowledge transmitters to emotional supporters of learning.

First, strengthen personalized feedback, providing targeted guidance based on students' specific learning difficulties and needs to make up for the mechanical nature and lack of contextual understanding of AI feedback; Second, it is to build a learning community, through group cooperation, peer evaluation and other methods, to create a positive learning atmosphere and counteract the possible sense of isolation brought by AI learning; third, it is to pay attention to the dynamic changes in learning motivation, promptly identify signs of motivation decline among students, and respond through teaching intervention. These measures reflect Bronfenbrenner's (1998) ecosystem theory's view that teacher support is a key element in the micro-environment, and also echo ElMajanini's (2024) finding on the importance of teacher emotional support for second language learning motivation.

5.3 Theoretical Reflection and Innovation

This study makes three contributions to the development of EFL motivation theory in the AI era: Firstly, the study proposes the hypothesis of "strengthening of instrumental rationality and weakening of intrinsic motivation" in the evolution of motivation in the AI era, enriching the theoretical understanding of the mechanism of L2 learning motivation changes in a technological environment. This hypothesis takes into account both the substitution effect of AI technology and its empowering potential, providing a theoretical framework for understanding the complex relationship between AI and EFL learning motivation.

Secondly, the study reveals the particularity of EFL learning motivation among Chinese engineering students, namely the "crowding-out effect" between the academic pressure of major courses and English learning, as well as the interactive influence between professional identity and English learning motivation. This finding expands the application of second language learning motivation theory to specific learner groups and provides a theoretical basis for targeted teaching intervention.

Finally, the study constructs a dynamic model of the second language motivation self-system in the AI era, revealing how AI technology reconstructs students' motivation structure through influencing the dimensions of Ideal L2 Self, Ought-to L2 Self, and L2 Learning Experience. This model provides a testable theoretical framework for subsequent research and theoretical guidance for teaching practice.

6. Conclusions and Suggestions

6.1 Research Conclusions

This study, through questionnaire surveys and qualitative analysis, explored the types, changes, and influencing factors of English learning motivation among Chinese engineering students in the AI era, and reached the following main conclusions:

First, the English learning motivation of Chinese college engineering students is dominated by instrumental motivation, with academic requirements and career development being the most prominent in the initial motivation, showing a clear pragmatism orientation. This motivation structure forms a complex interaction with the substitution possibilities provided by AI technology.

Second, the English learning motivation of engineering students shows a declining trend with the length of time at school, with excessive burden of major courses and low relevance of

course content to the major being the main reasons for the decline in motivation. This motivation decline reflects the special academic pressure faced by engineering students and also reveals the disconnection between current College English courses and professional needs.

Third, the popularity of AI tools in the English learning of engineering students is high, but students' evaluations of their actual effects tend to be conservative, presenting a contradictory phenomenon of "high usage rate and low sense of efficacy". This contradiction not only reflects the actual limitations of AI tools but also reveals the superficial characteristics of students' usage methods.

Fourth, engineering students have clear expectations for English teaching reform, particularly emphasizing the importance of profession-related content and personalized feedback, while also highly valuing the role of teachers' emotional support. These expectations provide directional guidance for College English teaching reform in China in the era of AI.

6.2 Teaching Improvement Suggestions

Based on the research findings, the following teaching improvement suggestions are proposed:

In terms of curriculum integration: Develop an engineering English module, integrating professional tasks such as technical document reading and project report writing into College English teaching class; establish interdisciplinary projects, such as "Engineering Innovation English Workshop", to achieve a deep integration of English learning and professional application.

As for AI application: Formulate an AI usage guideline, clearly defining the appropriate role and usage boundaries of AI tools in each learning stage; offer AI-assisted learning workshops to demonstrate how to use AI for brainstorming, outline drafting, and text revision, while maintaining academic integrity. In other words, devise proper supervising tasks to help students turn AI tools into customized personal AI tutors.

In terms of assessment reform: Establish a multidimensional assessment system, combining technical document translation (35%), collaborative presentation (25%), and academic writing (40%), to comprehensively evaluate students' English application abilities.

Teacher development: Implement teacher development programs, focusing on training personalized feedback skills based on AI tools; establish a teacher-student learning community to jointly explore English learning paths in the AI era through regular exchanges; delve into personal interests and difficulties of students through classroom observation and surveys, establishing emotional connections and support.

6.3 Research Limitations and Future Directions

This study has the following limitations: Firstly, the sample size is limited and comes from a single school, and the general applicability of the results needs further verification; secondly, the study mainly adopts a cross-sectional design, making it difficult to capture the dynamic process of motivation changes; finally, the measurement of AI tool usage is relatively macroscopic and fails to distinguish the possible differences among different types of AI tools. Future research can be conducted in the following aspects: First, carry out long-term follow-up studies to examine the long-term evolving trajectory of engineering students' English learning motivation; second, expand the sample range to include engineering students from different levels and types of universities to enhance the diversity of the samples and representativeness of the results; third, deeply explore the differentiated impacts of different types of AI tools on second language learning motivation; fourth, conduct teaching intervention studies to test the actual effects of different teaching strategies on maintaining and enhancing engineering students' English learning motivation.

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PIONEER
ACADEMIC PUBLISHING LIMITED

Journal of Advanced Research in Education
ISSN 2709-3980
www.pioneerpublisher.com/jare
Volume 4 Number 6 November 2025

Factors Influencing Female Students' Perceptions of Their Choice of Science Subjects at Senior Secondary Schools in Makurdi Metropolis, Benue State, Nigeria

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doi:10.56397/JARE.2025.11.02

Abstract

The study investigated female students' perceptions of selecting science subjects at senior secondary schools in Makurdi Metropolis, Benue State, Nigeria. A descriptive survey design was employed for the research. Two research questions and one hypothesis guided the investigation. The population included all female students in Boarding Secondary Schools (BSS) and Day Secondary Schools (DSS), approved by the Benue State Ministry of Education, with a sample of 1,500 students drawn from 50 schools using stratified random sampling. The Female Students' Choice of Science Subjects Questionnaire (FSCSSQ), developed by the researchers with a reliability coefficient of 0.80, was validated by two Science Education experts and one in Test and Measurement, and used to collect data. The data were analysed through descriptive statistics such as means and standard deviations to answer the research questions, while an independent sample t-test was conducted to test the hypothesis at a 0.05 level of significance. The results showed that factors such as peer influence, drug abuse, and early marriage, among others, significantly affect female students' choice of science subjects. There was a significant difference in how female students in BSS and DSS perceived these factors ($p<0.05$). The study recommended, among others, that the Ministry of Education and other relevant stakeholders should provide well-equipped laboratories, necessary textbooks, and other learning materials to support practical science education in both boarding and day secondary schools to attract more female students to the choice of science subjects. Ensure proper counselling for female students regarding science subject choices, and provide adequate science teachers and facilities in both boarding and day secondary schools to encourage more female students to choose science subjects. Relevant stakeholders should ensure science teachers are competent, enthusiastic, and supportive to make subjects more appealing to female students.

Keywords: female students, perception, choice, science subjects

1. Introduction

The study of science has been recognized worldwide as a key driver for advancement and development across all areas of human

endeavour. Core science subjects such as Biology, Chemistry, and Physics have become essential for students aiming for science-based careers in both developed and developing countries. Consequently, nations around the globe are striving to develop both male and female students in these fundamental sciences from primary through secondary education. To ensure gender balance in science-related careers like medicine, pharmacy, engineering, and geology (Chavatzia, 2020), both boys and girls are given equal opportunities to acquire scientific attitudes and process skills necessary for self-reliance and societal adaptation at each education level. Nevertheless, the perception among female students regarding their choice of science subjects remains a concern for many scholars, as most secondary school science classes—especially in developing countries like Nigeria—are predominantly male-dominated (Adams & Salome, 2014). Abe and Chikoko (2020) further assert that in most science classes, the number of boys exceeds that of girls. They emphasize that girls' perceptions of science subjects influence whether they approach them with confidence or develop a phobia, at any educational level.

Given the importance of science for both individual and national progress, it is essential to examine gender differences in science education, particularly the barriers or factors affecting female students' perceptions and enrolment in science at the secondary level, to promote gender equality in science-oriented careers. Archer, DeWitt, and Soderstrom (2017) assert that science, as a multidimensional field of study, especially at the secondary school level, is divided into three core subjects: chemistry, biology, and physics. While chemistry primarily concerns matter and its properties, biology deals with the scientific study of living things, their interactions, and their relationships with the natural environment. Physics involves the study of matter, energy, and their interactions. The authors highlight that chemistry, biology, and physics are foundational sciences that play a crucial role in both human progress and national development. These subjects provide the tools and knowledge necessary to address global challenges, foster technological innovation, and improve the quality of life. The subjects are interconnected, with advances in one often leading to breakthroughs in others.

According to Bello et al. (2020), National Academy of Sciences, Engineering and Medicine (NASEM, 2018), Chemistry, Biology and Physics are essential to humanity and in so many ways; chemistry is essential for addressing global challenges like climate change, water scarcity, and food security. It enables the development of sustainable technologies and processes. Chemistry is at the heart of medical advancements, including drug discovery, diagnostics, and the development of new materials for medical devices. Biology is fundamental to understanding the human body and its functions, enabling advancements in medicine, public health, and disease prevention. Biology helps us understand ecosystems, biodiversity, and the impact of human activities on the environment. Physics provides the fundamental principles that underpin technological advancements, from communication technologies to renewable energy sources. Physics helps us understand energy resources, develop renewable energy technologies, and optimize energy efficiency and so on. These subjects are useful to every human being, both males and females.

Murphy and Taylor (2017) opine that girls' perceptions of the choice of science subjects in secondary schools could be traced to several factors, such as peer influence, parental pressure, drug abuse, science phobia, early marriage, sexual harassment, poor science background, teacher factors, among other things. The authors maintained that it is only privileged girls at the secondary school level who overcome these factors and consider science subjects like chemistry, biology and physics as favourite subjects. Ezeudu (2018) argued that girls have the same cognitive abilities like boys if not more, thus if properly supported with affective characteristics of the learning process like little attention from science teachers to attract the girl's participation in the class, attendance to class, punctuality, neatness, politeness, self-control, relationship with others, curiosity, honesty, humility, tolerance, leadership and courage. The number of girls in science classes obviously would surpass that of boys. Akram et al. (2024) and Pekrun (2020) stated that both boys and girls receive equal attention and motivation influences from the teachers regarding the choice of science subjects, particularly at the secondary school level. The authors observed that females have a higher achievement motivation compared to males. It is

therefore quite disturbing that discrepancies still abound between the affective disposition of male and female students towards the choice of science subjects. Many scholars have investigated the factors influencing girls' perception of the choice of science subjects.

Naugh (2024) examined the factors which influence the choice of science subjects in Mauritius among girls at the end of the third year of secondary education, the level at which science is a compulsory subject. This low uptake of science subjects by girls beyond the compulsory level is a matter of concern. The study provided insights into teachers' teaching approaches, the behaviour and interest of pupils in the lessons and other factors such as pupils' perceptions of science, their self-identity and role models, and the extent to which parents and peers influence the choice of subjects among girls. The majority of the girls' experiences of science were negative, and this deterred them from taking science beyond the compulsory level, although they were aware of its importance. Teachers had positive opinions about girls' ability to do science, but stated that the lack of infrastructure facilities did not allow them to involve the pupils in practical work as much as they would wish. However, brighter girls' decisions to study sciences were not outweighed by these factors. Parents felt that they did not influence their daughters in the choice of subjects or eventual careers, though they held science in high esteem.

Musingarabwi and Maeresera (2020) explored the perceptions of female students of a secondary school regarding the influence of gender stereotypes on their choice of mathematics and on prospects of pursuing it at the tertiary level after they have completed it at the advanced level. Involving a purposive sample of twenty students, this qualitative case study employed slight quantitative data analysis. Questionnaires, focus group discussions, and interviews were used to collect data. The study established that the majority of students were aware of common stereotypical conceptions that society ascribed to the learning of mathematics by girls. Gender had little impact on the decision to learn mathematics at the advanced and tertiary levels. Although some participants perceived mathematics as being more appropriate for boys than girls, most participants indicated that the choice of mathematics at the advanced level and prospects of studying it at the tertiary level were not so much about gender as they were about several factors. Bahago, Fadipe and Uchenna (2022) investigated the characteristics that influence secondary school female students' choice of science disciplines and the need for counselling in Niger State, Nigeria. The study discovered that certain elements have a strong influence on female students' decisions to pursue science topics and have a sustained power over female students' choice and continuation of science subjects. Female Science students should be given more privileges, particularly in terms of accessing scholarships. Female students should be exposed to vocational counselling services, and educational practices that favour the girl child should be embraced and encouraged more so.

Oguru (2024) examined the inclusiveness of girl-children in STEM education within public senior secondary schools in Rivers State, Nigeria. The findings indicated that family background plays a vital role in shaping children's educational aspirations and choices, especially in STEM fields. The selection of science subjects or the placement of students into pure science classes follows established criteria that, without gender bias, base placements on previous performance in lower classes and provide equal learning opportunities. The primary issue is the reluctance of most girls, particularly at the secondary level, to study or enroll in core science subjects such as chemistry, biology, and physics. The challenge of achieving gender balance in major scientific careers, such as medicine, pharmacy, and engineering, remains a global concern in both developed and developing nations. Therefore, the problem of this study is formulated as follows: What are the perceptions of female students regarding the choice of science subjects at senior secondary schools in Makurdi metropolis, Benue State, Nigeria?

1.1 Purpose of the Study

The purpose of the study is to explore factors influencing female students' perceptions of choosing science subjects at senior secondary schools in Makurdi Metropolis, Benue State, Nigeria. Specifically, the study aims to;

1) Find out the extent to which factors influencing female students' perception affect their choice of science subjects at the

senior secondary school.

2) Find out the extent to which factors influencing female students' perception affect their choice of science subjects in Day Secondary Schools (DSS) and Boarding Secondary Schools (BSS).

1.2 Research Questions

The following research questions were answered in the study.

1) What is the extent to which factors influencing female students' perception affect their choice of science subjects at the senior secondary school?

2) What is the extent to which factors influencing female students' perception affect their choice of science subjects in Day Secondary Schools (DSS) and Boarding Secondary Schools (BSS)?

1.3 Research Hypothesis

The following hypothesis guided the study.

1) There is no significant difference in how female students in Day Secondary Schools (DSS) and Boarding Secondary Schools (BSS) perceive factors influencing their choice of science subjects.

2. Methodology

A descriptive survey design was employed in this study to examine female students' perception of choosing science subjects at senior secondary schools in Makurdi Metropolis, Benue State, Nigeria. The population consisted of all female students in approved Boarding Secondary Schools (BSS) and Day Secondary Schools (DSS) by the Benue State Ministry of Education, with a sample of 1500 selected from 50 schools through stratified random sampling. The Female Students' Choice of Science Subjects Questionnaire (FSCSSQ), developed by the researcher, which had a reliability coefficient of 0.80 and was validated by two experts in Science Education and one in Test and Measurement, was used to gather data. The instrument, containing Sections A and B, was based on a modified four-point Likert scale with ratings of 4, 3, 2, and 1: each item in the two sections was scored as follows — Great Extent (GE) = 4 points, range 3.50–4.00; Moderate Extent (ME) = 3 points, range 2.50–3.49; Less Extent (LE) = 2 points, range 1.50–2.49; No Extent (NE) = 1 point, range 0.50–1.49. Any item with a mean of 2.50 or above was deemed acceptable, while items with a mean below 2.50 were considered to reflect a lesser extent. The researcher, assisted by a trained research assistant, administered the questionnaires. Data were analysed using descriptive statistics, including mean and standard deviation, and the three null hypotheses were tested at a 0.05 significance level using an independent t-test.

3. Results

3.1 Research Question 1

What is the extent to which factors influencing female students' perception affect their choice of science subjects at the senior secondary school? The answer to research question one is presented in Table 1.

Table 1. Mean rating scores on the extent factors influence female students' perception of the choice of science subjects at the senior secondary school

S/N	Factors	No	(No. 1500)	
		$\bar{X}$	SD	DEC
1	Peer influence	2.64	1.12	ME
2	Parental Pressure	2.58	1.19	GE
3	Drug Abuse	3.70	1.14	ME
4	Intelligent Quotient (IQ)	2.60	1.15	ME
5	Early Marriage	4.00	1.16	GE
6	Family Background	2.60	1.21	ME
7	Poor Science Background	2.73	1.22	ME
8	Teacher's factor	4.00	1.17	LE
9	School Factor	4.00	1.19	LE
10	Poor Counseling	3.35	1.20	LE
		4.00		

Key: Great Extent (GE) =4, Moderate Extent (ME) = 3, Less Extent (LE) = 2, No Extent (NE) =1 (Survey, 2025).

The result in Table 1 revealed the extent to which factors influencing female students' perception affect their choice of science subjects at the senior secondary school in Makurdi Metropolis, Benue State. The result shows a recorded higher mean of 4.00, which implies factors such as peer influence, parental pressure, and drug abuse, among others, affect female

students' perception of the choice of science subjects at the senior secondary school to a great extent.

3.2 Research Question 2

What is the extent to which factors influencing female students' perception affect their choice of science subjects in Day Secondary Schools (DSS) and Boarding Secondary Schools (BSS)? The answer to research question two is presented in Table 2.

Table 2. Mean rating scores on the difference in the perception of science subjects by female students in Boarding Secondary Schools (BSS) and Day Secondary Schools (DSS)

S/N	Factors	BSS (No. 695)			DSS (No.805)		
		$\overline{X}$	SD	DEC	$\overline{X}$	SD	DEC
1	Peer influence	3.50	1.19	ME	3.80	1.13	GE
2	Parental Pressure	2.00	1.12	LE	2.50	1.18	ME
3	Drug Abuse	2.50	1.16	ME	3.80	1.16	GE
4	Intelligent Quotient (IQ)	3.66	1.13	ME	3.70	1.19	GE
5	Early Marriage	3.70	1.19	GE	3.60	1.15	GE
6	Family Background	2.10	1.11	LE	3.80	1.17	GE
7	Poor Science Background	3.60	1.17	ME	4.00	1.12	GE
8	Teacher's factor	2.20	1.19	LE	3.00	1.14	ME
9	School Factor	4.00	1.12	LE	2.60	1.17	ME
10	Poor Counseling	3.45	1.18	LE	2.60	1.18	ME
		3.39			**4.50**		
	Grand Mean = 4.00						

Key: Great Extent (GE) =4, Moderate Extent (ME) = 3, Less Extent (LE) = 2, No Extent (NE) =1 (Survey, 2025).

The result in Table 2 extent to which factors influencing female students' perception affect their choice of science subjects in Day Secondary Schools (DSS) and Boarding Secondary Schools (BSS). The result shows that the female students in BSS perceive the factors influencing them to a moderate extent, with a mean of 3.39, while the DSS students perceived the factors affecting their choice of science subjects to a great extent, with a mean of 4.50.

3.3 Hypothesis

There is no significant difference in how female students in Day Secondary Schools (DSS) and Boarding Secondary Schools (BSS) perceive factors influencing their choice of science subjects. The answer to the hypothesis is presented in Table 3.

Table 3. t-test of independent samples on the extent digital technologies are available in GSS and PSS

Variables	N	Mean	SD	t	df	P-value	Decision
BSS	695	2.8300	0.5114				
				0.050	1498	0.02	Rejected
DSS	805	3.9940	0.5323				

The t-test of independent samples on the extent female students in Boarding Secondary Schools (BSS) and Day Secondary Schools (DSS) perceived factors in their choice of science subjects recorded a t-test value of 0.052 with a p-value of 0.02. This is less than a 0.05 level of significance ($p=0.02<0.05$). Thus, the null hypothesis is rejected. This means there is a

significant difference in the extent female students in Boarding Secondary Schools (BSS) and Day Secondary Schools (DSS) perceived factors in their choice of science subjects.

4. Discussion

The result in Table 1 of research question 1 is on the extent to which factors influence female students' perception of the choice of science subjects at the senior secondary schools in BSS and DSS in Makurdi Metropolis, Benue State. The result shows that the BSS and DSS recorded higher means of 4.00 and 3.99, respectively. This implies that factors such as peer influence, parental pressure, and drug abuse, among others, affect female students' perception of the choice of science subjects at the senior secondary school in both BSS and DSS to a great extent. The result is agreement with Oguru (2024), who discovered that factors such as family background affect female students' choice of science subjects in school. The result in Table 2 of research question 2 is on the difference in the perception of choice of science subjects by female students in Boarding Secondary Schools (BSS) and Day Secondary Schools (DSS) perceived factors to their choice of science subjects. The result shows that the female students in BSS perceive the factors influencing them to a moderate extent, with a mean of 3.39, while the DSS students perceived the factors affecting their choice of science subjects to a great extent, with a mean of 4.50.

The t-test of independent samples on the extent female students in Boarding Secondary Schools (BSS) and Day Secondary Schools (DSS) perceived factors in their choice of science subjects recorded a t-test value of 0.050 with a p-value of 0.02. This is less than a 0.05 level of significance ($p=0.02<0.05$). Thus, the null hypothesis is rejected. This means there is a significant difference in the extent female students in Boarding Secondary Schools (BSS) and Day Secondary Schools (DSS) perceived factors in their choice of science subjects. The finding aligns with Bahago, Fadipe and Uchenna (2022), whose study revealed a significant difference in the female students' choice of science subjects due to factors such as peer groups, family background, IQ, students' ability to access adequate instructional materials, and the lack of career guidance/counselling services, all influence female students' choice of science topics.

5. Conclusion

Going by the findings of this study, it is a combination of personal, peer influence, parental pressure, drug abuse, and early marriage that significantly impact female students' perceptions and choices of the choice of science subjects at the senior secondary school in both BSS and DSS to a great extent. Key factors often include peer and parental influence or support, drug abuse, intelligence quotient, early marriage, poor science background, teacher quality and teaching methods, the school's learning environment (especially laboratory facilities), perceptions about science subjects and gender.

6. Recommendations

Based on the findings of this study, the following recommendations were made:

1) The Ministry of Education and other relevant stakeholders should provide well-equipped laboratories, necessary textbooks, and other learning materials to support practical science education in both boarding and day secondary schools to attract more female students to the choice of science subjects.
2) The Ministry of Education, school administrations and other relevant stakeholders should ensure science teachers are competent, enthusiastic, and supportive to make subjects more appealing to female students.
3) Science teachers should be enthusiastic and supportive, parents should actively engage with their children's science education, and schools should ensure access to modern teaching tools.
4) Science teachers should ensure the use of more engaging teaching methods, such as "science by doing," to improve understanding and interest.
5) The Ministry of Education and other relevant stakeholders should ensure proper counselling for female students at the senior secondary schools on the choice of science subjects.

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PIONEER
ACADEMIC PUBLISHING LIMITED

Journal of Advanced Research in Education
ISSN 2709-3980
www.pioneerpublisher.com/jare
Volume 4 Number 6 November 2025

From Knowledge to Competence: Educational Purpose in Competency-Based Education

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doi:10.56397/JARE.2025.11.03

Abstract

This paper examines the philosophical transformation of educational purpose under the global rise of Competency-Based Education (CBE). It argues that the shift from knowledge to competence represents not merely a reform of pedagogy but a reconfiguration of the normative foundations of education. Traditionally, knowledge occupied a formative and ethical role in shaping persons capable of judgment and reflection. CBE redefines this role through a logic of performance, in which learning is measured by demonstrable outcomes rather than oriented toward understanding. Drawing on the critical theories of Horkheimer, Habermas, and contemporary educational philosophers such as Chappell, Gonczi, Hager, and Waghid, the paper explores how instrumental rationality has narrowed the horizon of educational purpose. Competence, while valuable as a means of organizing learning, becomes problematic when elevated to an educational end. The analysis identifies three structural consequences of this shift: the internalization of purpose within technical systems, the managerial rationalization of learning, and the erosion of reflective and moral formation. In addressing major defenses of CBE—its neutrality, its integration of knowledge, and its pragmatic alignment with societal needs—the paper acknowledges their partial validity while showing that each rests on an implicit instrumentalism. It concludes by proposing a framework for reclaiming educational purpose beyond competence through the restoration of knowledge as a formative good, the cultivation of reflection and uncertainty, and the reaffirmation of education as an ethical encounter. The paper contends that education must remain a human practice oriented toward understanding, not a technical system of measurable performance.

Keywords: competency-based education (CBE), educational purpose, instrumental reason, knowledge and formation

1. The Rise of Competency-Based Education and the Question of Purpose

In recent decades, educational reform across many regions has been animated by a rhetoric of relevance, accountability, and measurable outcomes. Competency-Based Education (CBE) emerged as a response to concerns that traditional schooling emphasized abstract knowledge disconnected from practical performance. Originating in the behavioral and vocational education movements of the 1960s and 1970s, CBE sought to specify educational outcomes in precise, observable terms (Klingstedt, 1972). Within this framework,

learning was to be validated not by time spent in instruction but by demonstrated mastery of defined competencies. This model promised fairness, transparency, and alignment with the labor market, providing a seemingly objective basis for evaluating educational achievement (Ainsworth, 1977).

Beneath this reformative language lies a deeper philosophical shift. CBE reconfigures the very purpose of education by redefining its outcomes in behavioral and operational terms. Knowledge is no longer regarded as the central medium of formation but as a resource serving performance. The epistemic dimension of learning—its capacity to shape understanding, judgment, and identity—tends to be absorbed within measurable frameworks of competence. Education becomes a system of goal attainment rather than a process of cultivation. As Schilling and Koetting observe, CBE's intellectual genealogy rests upon an epistemology of control, where learning is understood as a form of prediction and management rather than exploration (Schilling & Koetting, 2010).

This transformation exemplifies what may be called the defaulting of educational purpose. Across many reform agendas, questions about the ends of education have receded into the background. Efficiency, employability, and performance occupy the space once reserved for reflection on what kind of person education ought to form. The purpose of education has not disappeared; it has been silently redefined in operational terms. As Moon argues, the spread of CBE in global reform discourse reflects a broader cultural movement that privileges measurable performance as the ultimate indicator of quality (Moon, 2007).

The argument of this essay is that the transition from knowledge to competence reshapes the normative core of educational purpose. Competence is not merely a technical category but a carrier of implicit assumptions about human development, value, and social order. When competence becomes the organizing principle of educational systems, the purpose of education undergoes a subtle contraction. It shifts from the cultivation of understanding to the optimization of performance. This essay explores that transformation, clarifies the conceptual foundations of competence, and reclaims an idea of educational purpose that transcends the instrumental rationality embedded in CBE.

The discussion unfolds in several stages. The second section revisits classical and modern understandings of educational purpose and knowledge, providing a normative baseline for later critique. The third clarifies the meaning of competence and its diverse interpretations in educational theory. The fourth traces the structural shift from knowledge-centered to outcome-oriented education. The fifth and sixth sections analyze how educational purpose becomes recoded and narrowed within CBE. The seventh engages with common defenses of CBE, showing that technical arguments cannot settle normative questions. The eighth proposes a more open conception of educational purpose that acknowledges competence without reducing education to it. The essay concludes by reflecting on the broader significance of this shift in the contemporary age of competence.

2. Educational Purpose and Knowledge: Classical and Modern Perspectives

Education has long been regarded as a practice oriented toward the formation of persons rather than the production of outcomes. In classical philosophy, the question of educational purpose was inseparable from the question of the good life. Plato's conception of paideia envisioned education as the cultivation of the soul toward knowledge of the good. Knowledge in this sense was formative, shaping both judgment and virtue. Aristotle's tripartite distinction between *episteme*, *techne*, and *phronesis* further elaborated this idea: knowledge encompassed theoretical understanding, practical skill, and ethical judgment. Education, therefore, aimed not at performance but at wisdom.

Modern educational thought reinterpreted these ideals in light of emerging notions of reason and autonomy. Kant understood education as a process of moral and rational self-legislation, in which knowledge enables individuals to act according to principles rather than impulses. The purpose of education was to cultivate the capacity for reason and freedom, positioning knowledge as the path to moral maturity. Knowledge thus retained its normative status: it was both emancipatory and constitutive of selfhood.

The Enlightenment's elevation of knowledge gradually gave way to new forms of instrumental rationality as industrialization and state administration expanded. The nineteenth and twentieth centuries saw education redefined

through systems of mass schooling aimed at economic productivity and civic conformity. In the twentieth century, John Dewey's pragmatism sought to reconcile knowledge and experience, defining learning as the reconstruction of experience through reflective inquiry. Dewey's vision preserved education's formative purpose even while emphasizing utility. Education's aim was not only to prepare individuals for work but also to foster intelligent participation in democratic life.

This historical arc provides a benchmark for evaluating contemporary transformations. Across classical and modern traditions, education was never merely a process of skill acquisition. It was a normative practice concerned with what kind of person one becomes through knowledge. The loss of this orientation marks the depth of the current shift. The competence paradigm, in its focus on measurable outcomes, reduces knowledge to an operational resource, stripping it of its formative significance. As Chappell, Gonczi, and Hager point out, this reduction arises when competence frameworks are employed as substitutes for educational philosophy rather than as its expression (Chappell, Gonczi, & Hager, 2020).

To re-engage with educational purpose, one must recover the idea that knowledge possesses a normative dimension. Knowledge not only enables performance but also shapes understanding of the world and oneself. It carries within it assumptions about truth, value, and meaning that define the horizon of education. Without acknowledging these assumptions, reforms risk collapsing education into training. The enduring task is to sustain an idea of education in which knowledge serves as both means and end, a process that forms judgment as well as competence.

3. Clarifying Competence: Conceptual Foundations and Educational Meanings

The term competence carries a layered and often contested meaning within educational discourse. Its genealogy traverses psychology, professional training, and organizational management, acquiring diverse interpretations along the way. As Klingstedt noted in one of the earliest philosophical treatments, CBE was founded on the belief that educational outcomes should be made explicit and measurable so that learning can be verified empirically (Klingstedt, 1972). This behavioral orientation framed competence as the observable ability to perform specified tasks under controlled conditions.

Three broad interpretations of competence can be identified. The first is technical competence, centered on the execution of specific procedures to a given standard. It corresponds to the behavioral models of learning that dominate vocational education and performance assessment. In this view, competence equates to accuracy and efficiency. Schilling and Koetting observe that such models are sustained by a managerial logic that values predictability over understanding, rendering learning a form of operational compliance (Schilling & Koetting, 2010).

The second is situational competence, which emphasizes contextual judgment and adaptability. This view, influenced by phenomenology and situated cognition, holds that competence involves not only knowing how to act but discerning what is appropriate in a specific situation. Education, under this conception, develops perceptiveness and responsiveness, qualities that cannot be reduced to procedural mastery. Chappell and colleagues highlight that genuine competence requires integrating knowledge, skill, and ethical discernment within the contingencies of practice (Chappell, Gonczi, & Hager, 2020).

The third interpretation is transferable competence, referring to capacities applicable across contexts, such as critical thinking, communication, and collaboration. These have been promoted as "twenty-first century skills," signaling education's adaptation to globalized economies and digital cultures. Yet even this broadened notion often remains framed within instrumental expectations of employability and adaptability rather than intellectual or ethical formation. Moon observes that CBE's global expansion reflects this instrumental orientation, which equates educational success with flexibility and measurable productivity (Moon, 2007).

Clarifying these distinctions reveals that the idea of competence itself is not inherently narrow. The problem arises when competence as an educational purpose replaces competence as an educational outcome. When competence serves as an outcome, it indicates the learner's ability to apply knowledge meaningfully. When it becomes the purpose, it defines the end of

education itself. In that shift, education risks losing its orientation toward understanding and becoming. The conceptual boundaries of competence must therefore remain open to philosophical scrutiny, lest the richness of education be reduced to the precision of performance metrics.

CBE's limitations thus lie not in the notion of competence but in its institutional codification. As Ainsworth observed, once educational achievement is translated into a system of discrete competencies, "the behavioral philosophy of education becomes self-validating," marginalizing inquiry and reflection (Ainsworth, 1977). To sustain a meaningful conception of educational purpose, competence must be reintegrated within a wider framework of knowledge and formation, where learning is not exhausted by what can be measured but remains animated by what can be understood.

4. The Turn from Knowledge to Competence

4.1 From Epistemic to Operational Rationality

The shift from knowledge-centered education to competency-based education is not simply a change in curriculum design. It represents a reordering of the epistemological and ethical foundations of modern schooling. For centuries, the pursuit of knowledge was understood as a moral and intellectual good in itself. Knowledge cultivated the human capacity for judgment, discernment, and imagination. It connected education to questions of truth, justice, and civic virtue. In the classical and humanist traditions, knowledge was the formative medium through which individuals became self-reflective and responsible members of a shared world.

Competency-Based Education (CBE) redefines this orientation. It introduces what can be called operational rationality, in which knowledge functions as a means to demonstrable outcomes rather than as an end of learning. This transformation began in the mid-twentieth century, when the behavioral sciences began to influence curriculum design and assessment. Educational psychologists such as Benjamin Bloom and Ralph Tyler promoted the view that learning should be defined through observable objectives, measurable through assessment. Within this framework, the epistemic content of education—concepts, theories, ideas—was subordinated to behavioral indicators of performance. Klingstedt identified this transition early on, describing CBE as a reform movement grounded in "precise specification of what learners must demonstrate" as evidence of mastery (Klingstedt, 1972).

This behavioral turn aligned with broader transformations in industrial and bureaucratic society. As organizations sought greater efficiency and predictability, education was recast as a form of human resource development. Learning became the process of acquiring competencies that could be mobilized for productivity. Magnusson and Osborne describe this development as the rise of "instrumental reason" in education: a mode of rationality that measures knowledge by its utility within systems of production (Magnusson & Osborne, 1990). The logic of performance thus displaced the older logic of understanding.

4.2 The Decline of Knowledge as a Public Good

The transformation of educational rationality must also be seen in relation to the changing social status of knowledge. In the Enlightenment and early modern period, knowledge was regarded as a public good. Universities were institutions for the cultivation of shared reason, grounded in the ideal that truth possessed intrinsic value beyond immediate utility. The expansion of mass education in the nineteenth and twentieth centuries extended this principle to citizens, linking knowledge to democratic participation and human emancipation.

By the late twentieth century, however, the rise of global capitalism and the knowledge economy redefined the function of education. Knowledge came to be valued for its capacity to generate innovation, competitiveness, and employability. Educational institutions were increasingly evaluated according to measurable outputs: graduation rates, employment statistics, and standardized test performance. Under such conditions, knowledge ceased to be an intrinsic public good and became an economic resource. The university became a producer of competencies for the labor market, while schools became sites of performance management. This reconfiguration of knowledge aligns with what Habermas calls the colonization of the lifeworld by systems of instrumental rationality, where communicative and ethical dimensions are displaced by technical control.

Chappell, Gonczi, and Hager note that competency-based systems "construct all learning as instrumental and performative,"

dissolving the distinction between education as a space of reflection and training as a system of compliance (Chappell, Gonczi, & Hager, 2020). Under this paradigm, knowledge acquires meaning only insofar as it contributes to measurable performance. The epistemological and ethical questions that once animated education—What counts as truth? What kind of person should we become?—are replaced by managerial questions about outcomes and accountability.

4.3 The Governance Function of Competence

The rapid adoption of CBE across policy contexts cannot be explained solely by pedagogical considerations. Its appeal lies in its governance function. Competence provides a language of control that renders learning visible, quantifiable, and comparable. It allows policymakers to translate the complex processes of education into discrete indicators that can be monitored and reported. This managerial rationality aligns education with the techniques of auditing and performance management that dominate modern institutions.

Waghid observes that this managerial framing of education reflects a deeper philosophical tension between education as formation and education as production (Waghid, 2003). Formation, or Bildung, conceives education as the cultivation of understanding and ethical judgment. Production conceives it as the efficient creation of measurable skills. The language of competence belongs to the latter, where learning outcomes are predetermined and standardized. The learner becomes a performer within a regulated system rather than an inquirer engaged in self-cultivation.

The governance advantages of competence are significant. Competency frameworks simplify the relationship between teaching and accountability. They provide administrators with quantifiable evidence of performance and funders with assurances of efficiency. Yet, as Magnusson and Osborne argue, this very efficiency conceals a philosophical loss: "The rationalization of learning under the rubric of competence transforms education into a form of management" (Magnusson & Osborne, 1990). The managerial promise of transparency masks the disappearance of reflection. When the purposes of education are encoded in performance standards, the space for questioning those purposes vanishes.

4.4 The Seductive Simplicity of Outcomes

The movement toward competence is sustained by the seductive simplicity of outcomes-based logic. Outcomes appear objective and neutral, offering clarity in a world of educational ambiguity. They promise to replace vague ideals with measurable criteria. In practice, however, outcomes obscure the complexity of learning. They reduce rich intellectual and moral processes to observable behaviors. Learning becomes a matter of alignment between input and output rather than transformation and meaning.

Preston describes this as the existential threat of competency: a reduction of human learning to quantifiable performance that erodes the reflective dimension of education (Preston, 2017). When learners internalize the expectation that their worth is measured by performance indicators, education risks becoming an exercise in self-optimization. The uncertainty, curiosity, and wonder that accompany genuine understanding are replaced by the anxiety of demonstration. The learner becomes both the subject and object of assessment, governed by the imperative to perform.

Ainsworth's early critique remains relevant here. Writing in *The Journal of Higher Education*, he argued that CBE's focus on achievement "exclusive of the concept of understanding" risks producing technically competent but intellectually impoverished graduates (Ainsworth, 1977). The modern educational landscape bears witness to this danger. Students are trained to master frameworks and rubrics, yet they often struggle to articulate why knowledge matters or how it relates to the human condition. The substitution of competence for knowledge thus narrows not only what education achieves but also what it imagines as possible.

4.5 The Reconfiguration of the Learner

One of the most profound consequences of the turn to competence is the reconfiguration of the learner. Under knowledge-centered education, the learner was conceived as an autonomous subject engaged in inquiry and reflection. The goal of education was to cultivate intellectual independence and ethical discernment. Under CBE, the learner becomes a performer whose achievements are verified through demonstration. Learning is externalized in outcomes, and the learner's

interiority—understanding, motivation, uncertainty—becomes invisible.

Chappell and colleagues describe this transformation as the technologization of learning, where pedagogy becomes a set of procedures for producing specified outcomes (Chappell, Gonczi, & Hager, 2020). In such systems, reflection and dialogue risk being marginalized because they cannot easily be measured. The learner's identity becomes bound to performance records, portfolios, and rubrics. This aligns with Foucault's analysis of disciplinary power, in which subjects are constituted through systems of surveillance and normalization. Education thus shifts from an emancipatory to a regulatory function.

This transformation has ethical implications. When learners are evaluated solely on competencies, their value is determined by conformity to institutional expectations. Individual differences of perspective or interpretation are often treated as deficiencies rather than expressions of intellectual independence. The learner's capacity for critique, imagination, or resistance becomes secondary to their capacity for compliance. Such a conception of learning may produce efficient workers, but it cannot sustain democratic citizens or reflective thinkers.

4.6 Competence and the Logic of the Market

The global spread of CBE also reflects the penetration of market logic into education. In policy discourse, competencies are often equated with employability, flexibility, and adaptability—qualities prized in post-industrial economies. Education is thus positioned as a supplier of human capital, and learning is framed as investment. The vocabulary of competence dovetails neatly with the vocabulary of economics. Both treat human potential as a measurable asset.

Moon's analysis of education reform notes that CBE's expansion coincided with the emergence of neoliberal governance, where the value of knowledge is determined by its contribution to competitiveness and innovation (Moon, 2007). In this context, educational policy adopts the language of efficiency and accountability drawn from the corporate world. Learners are redefined as consumers, and institutions as providers of services. The success of education is judged by market outcomes rather than intellectual or moral development.

This economization of education produces a paradox. By promising relevance, it risks undermining meaning. When the purpose of learning is aligned entirely with employability, the question of what constitutes a good or just society becomes irrelevant. Education ceases to cultivate judgment and becomes a tool of adaptation. As Magnusson and Osborne caution, "competence becomes the ideology of late modernity," legitimizing systems that value control over reflection (Magnusson & Osborne, 1990).

4.7 Beyond the Binary: Knowledge and Competence as Complementary

Although the critique of CBE is compelling, it would be mistaken to romanticize knowledge as an unproblematic ideal. Traditional knowledge-centered education often reproduced elitism, abstraction, and exclusion. The rise of competence represents an attempt to make learning more accessible, transparent, and accountable. In principle, competence need not negate knowledge. It can provide a bridge between understanding and application, ensuring that education remains connected to practice and experience.

Chappell and Hager propose a more integrated conception of competence that includes reflective, ethical, and contextual dimensions. They argue that genuine competence involves not only technical skill but also "the capacity for judgment and meaning-making within practice" (Chappell, Gonczi, & Hager, 2020). This conception resists the reduction of competence to performance by linking it to knowledge and understanding. In such a model, competence becomes an expression of Bildung rather than its replacement.

The challenge, however, lies in institutional realization. Educational systems organized around assessment and accountability find it difficult to sustain open-ended conceptions of learning. Reflection, dialogue, and uncertainty resist quantification. Unless institutional structures are redesigned to value these dimensions, competence will continue to function as a mechanism of control rather than empowerment.

The turn from knowledge to competence marks a structural transformation in the meaning of education. It redefines what it means to know, to learn, and to be educated. Knowledge loses its autonomy and becomes a function of

performance. Learning is reorganized as production, and the learner as a measurable unit of output. These changes reflect not only pedagogical trends but also broader social shifts toward instrumental rationality, managerial governance, and economic efficiency. Yet the consequences are not merely structural; they are human. When education is reduced to competence, learners lose the space for uncertainty, imagination, and self-formation. The moral dimension of education—its concern with what is good, just, and meaningful—fades behind the imperative to perform. The task for contemporary educators and theorists is not to reject competence but to re-situate it within a richer conception of learning, where knowledge remains formative and inquiry remains open. The turn from knowledge to competence thus poses a fundamental question to modern societies: whether education will continue to serve as a space for the cultivation of understanding or become an instrument for the management of performance. The answer to that question will determine not only the future of education but the future of human freedom.

5. Educational Purpose under Competency-Based Education

5.1 From Normative Reflection to Technical Design

Competency-Based Education (CBE) transforms the very grammar through which educational purpose is articulated. In the classical tradition, educational purpose is a normative question. It concerns the moral and intellectual formation of persons, asking what it means to live well and act wisely. Within the CBE framework, purpose becomes a technical matter of program design. It is expressed through learning outcomes, assessment rubrics, and measurable indicators. The central question shifts from "What is education for?" to "What can education produce?" This is not a trivial linguistic substitution but a reorganization of meaning.

The transformation can be traced to the managerial rationality that has permeated public institutions since the late twentieth century. Schools and universities are increasingly evaluated through performance metrics, funding models, and audits. The discourse of competence fits neatly into this regime. It offers a vocabulary that translates education into quantifiable outcomes, enabling governance through data. As Schilling and Koetting observe, the philosophical underpinnings of CBE rest upon a "technological interpretation of education," where learning becomes a form of production rather than cultivation (Schilling & Koetting, 2010).

The danger of this transformation lies not in the pursuit of effectiveness but in the displacement of reflection by technique. The problem is not that CBE defines learning outcomes but that it defines them as substitutes for educational purposes. Purpose becomes internal to the system, encoded within its operational logic, and detached from broader philosophical or ethical reflection. This internalization renders educational institutions efficient yet hollow, able to measure everything except meaning.

5.2 The Logic of Contraction

Educational purpose under CBE experiences what can be called a triple contraction. Each contraction narrows the horizon within which education can be understood.

The outcome contraction occurs when learning is reduced to observable achievements. CBE's insistence on demonstrable performance compresses the open-ended nature of learning into discrete and assessable behaviors. Learning ceases to be a process of inquiry or discovery and becomes an act of completion. Preston identifies this contraction as the core of what he calls the "existential threat of competency," where human learning loses its reflective and transformative dimensions (Preston, 2017). The learner becomes an executor of tasks rather than an explorer of ideas.

The temporal contraction follows from the first. Competence frameworks emphasize immediacy and accountability. They privilege short-term demonstrations over long-term cultivation. The temporal rhythm of education—its capacity for patience, repetition, and contemplation—is replaced by the urgency of proof. In CBE systems, learning is verified through evidence collected in portfolios and standardized assessments, compressing complex developmental processes into snapshots of performance. The slowness of education, once considered integral to formation, becomes inefficiency.

The normative contraction is the most profound. In knowledge-centered traditions, the purposes of education were debated in moral and political terms. CBE translates these debates into the language of effectiveness. Values are redefined as competencies: ethical judgment becomes

"ethical decision-making," civic responsibility becomes "participation competency," and aesthetic appreciation becomes "cultural literacy." In this translation, education's normative dimension is rendered technical. Bagnall and Hodge describe this process as an "epistemology of control," in which the moral ambiguity of human learning is domesticated by managerial rationality (Bagnall & Hodge, 2016).

These contractions reveal how CBE reshapes not only pedagogy but also the ontology of education itself. The meaning of being educated becomes synonymous with the ability to perform predefined acts. What cannot be measured—understanding, imagination, moral struggle—gradually disappears from view.

5.3 Embedded Purpose and Administrative Rationality

In the architecture of CBE, educational purpose is no longer external to institutional practice. It becomes embedded within procedures, frameworks, and assessment systems. Once codified in competencies, purpose is no longer a matter of deliberation but of implementation. Educators are not asked to debate what counts as worthwhile learning; they are tasked with aligning instruction to predetermined standards.

This embedding process transforms purpose into a governance mechanism. Educational outcomes become performance indicators for teachers, students, and institutions alike. The system thereby converts philosophical questions into administrative tasks. Magnusson and Osborne's deconstructionist analysis of the competency movement identifies this as a form of ideological closure: "the redefinition of educational questions as management problems" (Magnusson & Osborne, 1990). Once purpose is embedded in technical structures, critique itself becomes marginalized. The question "why" gives way to the question "how."

The embedding of purpose within administration has profound consequences for academic autonomy. Teachers increasingly function as facilitators of competencies rather than interpreters of knowledge. Their professional judgment becomes constrained by frameworks of accountability. The curriculum loses its open texture and becomes a grid of outcomes. This proceduralization of education aligns with the logic of bureaucratic governance identified by Max Weber, where rationalization leads to the domination of technical means over substantive values. In CBE, the educational good becomes indistinguishable from institutional efficiency.

5.4 The Technologization of Learning

The embedding of purpose also results in the technologization of learning. Education is reimagined as a system of inputs, processes, and outputs that can be optimized through design. The pedagogical relationship between teacher and student becomes mediated by digital platforms, rubrics, and algorithms. Learning analytics and automated assessments translate human development into data flows. This technological mediation further distances education from its humanistic roots.

Chappell, Gonczi, and Hager argue that CBE's adoption of technological rationality reflects a broader epistemological shift from reflective understanding to performative measurement (Chappell, Gonczi, & Hager, 2020). In this environment, learning is defined not by what the learner knows but by what the system can record. The educational relationship becomes a process of calibration between instruction and assessment. Students are trained to self-monitor, self-assess, and self-report, internalizing the evaluative gaze of the institution. The pursuit of truth or meaning gives way to the management of performance.

Technological mediation also changes the emotional texture of learning. Anxiety and self-surveillance replace curiosity and wonder. Learners become project managers of their own development, constantly producing evidence of competence. The moral horizon of education—its invitation to encounter the unknown—is replaced by an economy of validation. Preston's existential critique is acute on this point: when learning is reduced to competence, "human education ceases to be an adventure and becomes an exercise in proof" (Preston, 2017).

5.5 The Displacement of Formation by Optimization

Competency-based systems redefine education as optimization. The ideal learner is efficient, adaptable, and measurable. Formation—understood as the gradual development of judgment, taste, and moral sensibility—is displaced by continuous improvement. The question is no longer what kind of person one becomes but how well one performs relative to benchmarks.

This displacement reflects the deep penetration of economic rationality into education. Moon identifies this as part of the global reform agenda that treats education as a subsystem of economic competitiveness (Moon, 2007). CBE's focus on employability and skill alignment mirrors corporate management principles. Educational institutions are expected to function like enterprises that produce competent graduates as human capital. In this process, the ethical and civic dimensions of education are marginalized. The learner is no longer a citizen or moral agent but a resource.

Such economization transforms not only institutions but subjectivities. Students are encouraged to see themselves as self-entrepreneurs responsible for maintaining their "skills portfolio." Teachers are urged to design learning in terms of measurable deliverables. Even intellectual inquiry is reframed as "research impact." The vocabulary of competence thus naturalizes an economic ontology of the self. Education becomes a technology of self-optimization aligned with market imperatives.

5.6 The Ontological Cost of Competence

The reduction of educational purpose to competence entails a loss that is both epistemological and ontological. Epistemologically, it narrows what counts as knowledge to what can be operationalized. Ontologically, it redefines the learner as a functional being rather than a reflective subject. This double reduction transforms education from a process of becoming into a process of adaptation.

Bagnall and Hodge emphasize that this transformation is not accidental but systemic. Competence frameworks, by their very design, "constrain the epistemic field" of learning and regulate the kinds of identities that can emerge within it (Bagnall & Hodge, 2016). The learner's relationship to knowledge becomes instrumental, mediated by external validation. The notion of learning as self-formation or moral awakening becomes unintelligible within this logic.

The ontological cost of competence is thus a loss of depth. Education no longer addresses the inner life of the learner—their sense of purpose, wonder, or moral struggle. It addresses only what can be observed and certified. Preston warns that this leads to "an erosion of the metaphysical dimension of education," the space in which human beings confront questions of meaning and existence (Preston, 2017). When education forgets this dimension, it ceases to be education in the humanistic sense and becomes a system of training.

5.7 The Persistence of Purpose Beneath the System

Despite these transformations, educational purpose does not disappear entirely. It persists beneath the surface of systems and standards, manifesting in moments of curiosity, dialogue, and wonder that resist quantification. Even within CBE frameworks, teachers and students often reclaim spaces for reflection. These acts of resistance demonstrate that purpose cannot be eradicated; it can only be suppressed.

Educational purpose persists because it is intrinsic to the act of learning itself. To learn is to orient oneself toward meaning. No amount of managerial design can eliminate this orientation. The challenge lies in making it visible again. This requires reclaiming the language of purpose from the language of performance. It demands that educators reassert their role as interpreters of meaning rather than implementers of policy.

Preston suggests that the future of education depends on recovering "the existential imagination," the capacity to see learning as a mode of being rather than a process of doing (Preston, 2017). In this sense, critique of CBE is not nostalgia but necessity. It is a call to preserve the human vocation of education in the face of technical and bureaucratic encroachment.

The redefinition of educational purpose under CBE reveals the vulnerability of education to the forces of instrumental rationality. When purpose is operationalized, education loses its reflective depth. It becomes a self-referential system that can measure its efficiency but not its meaning. Yet the very persistence of critique, both philosophical and pedagogical, shows that this transformation is not total. Reclaiming educational purpose requires reasserting the distinction between means and ends. Competence may serve as a means of structuring learning, but it cannot define its ultimate end. The end of education must remain open, shaped by reflection on human flourishing rather than institutional convenience. As Bagnall and Hodge remind us, "education begins where measurement ends" (Bagnall & Hodge, 2016). Purpose, in this sense, is not a goal to be achieved but a horizon to be pursued.

6. Instrumental Reason and the Narrowing of Educational Purpose

6.1 The Concept of Instrumental Reason

The notion of instrumental reason occupies a central place in critical theory and provides an incisive lens for understanding the transformation of education in the age of Competency-Based Education (CBE). First articulated by Max Horkheimer and Theodor Adorno in *Dialectic of Enlightenment* (1944), instrumental reason describes a mode of rationality that subordinates thought to utility. It measures knowledge by its capacity to control, predict, or produce results rather than by its capacity to reveal meaning or truth. In this view, reason itself becomes a tool of domination. It ceases to inquire into ends and concerns itself only with the optimization of means.

Horkheimer distinguished instrumental reason from objective reason, which once guided moral and philosophical reflection on the good and the just. Objective reason asked what was worth doing; instrumental reason asks only how something can be done efficiently. When this rationality enters education, it converts learning into a process of optimization. Knowledge becomes a technical resource rather than a domain of understanding. Questions about the meaning of knowledge, the cultivation of character, or the formation of judgment are displaced by questions about performance, assessment, and employability.

Within contemporary educational systems, CBE exemplifies this rationality. Its design rests on the logic of specification, measurement, and control. Every educational act must produce demonstrable outcomes, and every learner must show evidence of mastery. As Magnusson and Osborne explain, the rise of CBE reflects the broader "instrumentalization of learning," where the value of knowledge is equated with its function within systems of accountability (Magnusson & Osborne, 1990). Instrumental reason thus provides both the philosophical foundation and the political logic of competency-based reform.

6.2 Rationalization and the Loss of Ends

The dominance of instrumental rationality in education represents a broader historical process of rationalization, which Max Weber identified as characteristic of modern societies. Rationalization brings predictability, efficiency, and control, but it also produces what Weber called the "iron cage" of bureaucratic logic. In education, this manifests as the proliferation of assessment systems, accountability frameworks, and quality assurance mechanisms. The language of competence fits perfectly within this environment because it translates learning into a series of operational tasks. The question of *why* one learns is replaced by the question of *how effectively* one learns.

The classical tradition of education, stretching from Aristotle's notion of *phronesis* to John Dewey's conception of reflective inquiry, assumed that knowledge served to orient human action toward good ends. Instrumental rationality severs this connection. It treats knowledge as neutral and value-free, ignoring the moral dimension of understanding. The consequences are profound. Educational institutions become highly efficient in producing measurable outcomes but increasingly incapable of articulating why those outcomes matter. The purpose of education becomes self-referential: it exists to improve its own performance indicators.

Chappell, Gonczi, and Hager have observed that this self-referentiality underlies the "performative culture" of modern education, where learning is judged not by intrinsic understanding but by evidence of productivity (Chappell, Gonczi, & Hager, 2020). In this environment, knowledge is validated by its capacity to generate measurable performance. The rational pursuit of ends gives way to the administrative management of results. The narrowing of educational purpose is thus not an accidental byproduct of reform but the logical outcome of instrumental reason applied to learning.

6.3 The Technocratic Transformation of Purpose

Instrumental reason transforms educational purpose into a technocratic project. It redefines educational success through measurable criteria such as efficiency, completion rates, and employability. These criteria appear neutral but encode a specific conception of the learner as a productive unit. Under CBE, the learner's value lies in their demonstrable competencies, which can be audited, compared, and certified. Learning becomes a technology of control that aligns human development with institutional priorities.

Habermas's distinction between instrumental and communicative rationality** illuminates this

transformation. In communicative rationality, meaning is generated through dialogue and mutual understanding; in instrumental rationality, meaning is replaced by efficiency. Educational purpose shifts from cultivating communicative engagement with the world to optimizing behavior within it. The discourse of CBE celebrates transparency and accountability, yet these values operate within a closed system that excludes moral and existential reflection. What counts as valuable learning is already decided by the framework itself.

Preston's *Competence-Based Education and Training and the End of Human Learning* explores this technocratic drift as an existential problem. He argues that when learning is defined solely by competence, the learner's inner life—curiosity, doubt, and wonder—becomes irrelevant (Preston, 2017). The human subject is reconstructed as an instrument of performance. The educational process, which once invited learners to question, imagine, and interpret, becomes a process of adaptation. The rationalization of purpose thus produces an ontological impoverishment: learners are taught how to achieve but not why achievement matters.

6.4 Learning as Optimization and Surveillance

Instrumental rationality produces a distinctive pedagogy of optimization and surveillance. Education is organized as a system for improving performance through continuous monitoring. Learners are expected to manage their progress, demonstrate self-regulation, and provide evidence of mastery. The teacher becomes a facilitator of data collection rather than a guide in inquiry. The classroom transforms into a site of verification.

Chappell and Hager describe this system as one in which "learning is no longer judged by insight or creativity but by conformity to predefined criteria" (Chappell, Gonczi, & Hager, 2020). The surveillance of learning is not necessarily coercive; it operates through the internalization of accountability. Students learn to monitor themselves, to think in the categories of performance, and to evaluate their worth through measurable results. The outcome is a form of self-regulation that mirrors the dynamics of the workplace.

Michel Foucault's analysis of disciplinary power helps clarify this phenomenon. Under CBE, power operates not by repressing learning but by structuring its possibilities. The learner's freedom is exercised within a pre-defined system of competencies. Autonomy becomes indistinguishable from compliance. Instrumental rationality thus reproduces a subtle form of domination: it shapes the very ways learners understand themselves. Education becomes a technology of the self, guiding individuals to align their aspirations with the imperatives of productivity.

6.5 The Ethical and Ontological Consequences

The ethical consequences of instrumental reason in education are visible in the erosion of responsibility and judgment. In the classical conception, education formed the capacity for moral discernment—the ability to act wisely in uncertain situations. Instrumental rationality, by contrast, privileges procedural correctness over moral reflection. It replaces questions of value with questions of efficiency. Learners are taught to comply with standards rather than deliberate about principles.

This shift has ontological implications. The learner is no longer a being-in-formation but a being-in-performance. The interior life of the learner, once nurtured through dialogue and contemplation, is rendered invisible. Preston warns that this transformation produces "a crisis of interiority" in education, where selfhood becomes fragmented into measurable competencies (Preston, 2017). The capacity to dwell in uncertainty—to think beyond outcomes—erodes. Education ceases to cultivate the ability to live meaningfully with complexity.

The loss of interiority also affects teachers. As educational purpose becomes technical, the moral and intellectual agency of teachers is constrained. They become implementers of curricula rather than participants in philosophical reflection. Magnusson and Osborne note that this loss of agency results in the depersonalization of teaching, where educators are valued for procedural fidelity rather than interpretive wisdom (Magnusson & Osborne, 1990). Instrumental rationality thus narrows the ethical scope of education at every level—from learners to institutions.

6.6 Education and the Market Logic of Instrumentality

Instrumental reason in education is inseparable from the market logic that dominates late modern societies. CBE thrives in environments where learning is framed as investment and

knowledge as capital. The economic metaphor reshapes educational purpose. Schools become suppliers of human capital, students become investors in their employability, and learning becomes a commodity. The question of educational purpose is subsumed under the question of market alignment.

Moon identifies this economic rationality as the defining characteristic of global education reform. The rhetoric of competence aligns with neoliberal ideals of flexibility, adaptability, and self-management (Moon, 2007). The result is a new subjectivity: the enterprising learner who continuously upgrades their competencies to remain competitive. Education thus becomes a lifelong project of optimization in service of economic systems. Learning is reimagined as labor.

This economization of education carries ideological consequences. It masks power relations behind the neutral language of competence. Learners are told that success depends on their skills, obscuring structural inequalities that shape access to knowledge. The discourse of meritocracy legitimizes inequality by presenting performance as objective measurement. Instrumental reason thus reinforces the very hierarchies it claims to transcend. The narrowing of educational purpose becomes a mechanism of social normalization.

6.7 Resistance and the Recovery of Reflective Reason

Despite its pervasiveness, instrumental rationality is not total. Education still contains moments of resistance where reflection interrupts optimization. Critical pedagogy, inspired by thinkers like Paulo Freire, reminds us that learning is inherently dialogical and ethical. Freire's concept of *conscientização*—the awakening of critical consciousness—offers an antidote to instrumental reason. It positions education as a practice of freedom, not a process of adjustment.

Waghid's philosophical defense of non-instrumental education echoes this spirit. He argues that education must remain committed to the cultivation of practical reason, the capacity to deliberate about the good in plural contexts (Waghid, 2003). Such reason cannot be reduced to competencies because it involves judgment, empathy, and imagination. It is exercised through participation in dialogue, not compliance with standards.

Reclaiming reflective reason in education requires rethinking assessment, pedagogy, and institutional culture. Assessment must move beyond performance indicators to include interpretive and dialogical dimensions of learning. Pedagogy must be oriented toward understanding rather than completion. Institutions must rediscover their moral vocation as spaces of inquiry. As Habermas insists, communicative rationality offers an alternative to the instrumental: it grounds education in the pursuit of mutual understanding rather than efficiency.

The narrowing of educational purpose under CBE is a symptom of the broader ascendancy of instrumental reason in modern life. By reducing knowledge to performance, it transforms education into an apparatus of optimization. The learner becomes a producer of evidence, and the teacher becomes a manager of outcomes. Yet the persistence of critique demonstrates that education still harbors a countervailing impulse: the desire to understand and to become. To resist the hegemony of instrumental rationality is not to reject efficiency or accountability but to restore reflection as the heart of education. Purpose must once again include moral and existential dimensions. Learning must be understood not as the achievement of competencies but as participation in a shared search for meaning. Only by reclaiming this reflective vocation can education remain a human endeavor rather than a technical system.

7. Addressing Defenses of Competency-Based Education

7.1 The Need to Engage Defenses Philosophically

Critiques of Competency-Based Education (CBE) often risk appearing dismissive if they fail to acknowledge the genuine aspirations that motivate reform. CBE's defenders do not see themselves as undermining education's moral or intellectual depth. On the contrary, they present it as a pragmatic innovation designed to make education more responsive, transparent, and equitable. Many of its advocates work from within traditions of progressive reform that emphasize learning outcomes, student agency, and real-world relevance. A philosophical critique must therefore begin by granting these motivations their seriousness. The issue is not whether CBE can yield technical improvements, but whether it can sustain education's normative and formative purposes.

Klingstedt's early defense of competency-based reform in the 1970s was grounded in democratization. He argued that making learning outcomes explicit could reduce arbitrariness in evaluation and create fairer opportunities for all learners (Klingstedt, 1972). Later advocates such as Sturgis (2016) and Spady (1994) developed this argument further, suggesting that competency frameworks empower students by clarifying expectations and allowing individualized progression. These defenses point to real limitations in traditional knowledge-centered systems, where success often depends on implicit cultural capital rather than transparent standards. Yet the philosophical problem arises when transparency becomes totalizing—when the measurable replaces the meaningful.

The following subsections examine three common defenses of CBE and explore how each, while containing valid insights, reveals deeper tensions concerning educational purpose. These defenses are: (1) the organizational defense, which treats CBE as a neutral framework; (2) the epistemic defense, which argues that competence inherently includes knowledge and judgment; and (3) the pragmatic defense, which holds that education must serve economic and social needs. Addressing these claims requires moving beyond surface-level pragmatics to consider the ontological and normative implications of defining education through competence.

7.2 The Organizational Defense: "CBE Is Just a Model"

The first and most frequent defense holds that CBE is not a philosophy of education but a technical framework for organizing teaching and assessment. Advocates claim that it merely provides clarity by specifying what students should know and be able to do. This defense rests on a distinction between form and content: CBE is said to affect only the form of educational delivery, leaving its deeper purposes untouched. By this logic, philosophical critiques are misdirected, because the framework itself carries no normative assumptions.

At first glance, this argument seems persuasive. Teachers can, in theory, design competencies that include ethical, critical, and creative outcomes. The structure of CBE does not predetermine the content of what is taught. Yet as Schilling and Koetting note, every instructional framework implicitly encodes a conception of the learner and the teacher (Schilling & Koetting, 2010). In practice, the operational logic of CBE privileges what can be standardized, recorded, and compared. Its form gradually shapes its content. The categories of competence, no matter how flexibly defined, function as containers that favor measurable over interpretive knowledge.

Magnusson and Osborne's critical analysis makes a similar point. They argue that the "neutrality" of competency discourse is illusory because the very act of specifying learning in advance transforms education into a process of compliance (Magnusson & Osborne, 1990). The neutrality of form conceals a technocratic conception of purpose. The moment learning is structured around demonstrable outcomes, the unpredictable and dialogical character of inquiry is subordinated to performance verification. Thus, even if CBE is introduced as a neutral model, it carries a latent epistemology that values precision over ambiguity, certainty over exploration, and management over reflection.

The organizational defense, then, cannot hold. CBE's neutrality is structural, not philosophical; its very procedures enact a form of instrumental reason. Educational purpose becomes embedded in the operational logic of the system. Once purpose is internalized in procedure, reflection on purpose itself becomes unnecessary or even unintelligible. The claim that CBE is "just a model" fails because all models, once institutionalized, become carriers of implicit norms.

7.3 The Epistemic Defense: "Competence Includes Knowledge"

A second defense asserts that competence does not exclude knowledge but rather presupposes it. Advocates argue that CBE is compatible with knowledge-centered education because genuine competence involves understanding as well as skill. Chappell, Gonczi, and Hager advance this argument persuasively, proposing that competence be defined as the "holistic integration of knowledge, skills, attitudes, and values within contextually appropriate action" (Chappell, Gonczi, & Hager, 2020). On this view, competence frameworks can promote deep learning by connecting theory with practice, reducing the gap between abstract knowledge and real-world application.

This epistemic defense addresses a legitimate concern about traditional schooling. Academic systems have often privileged theoretical abstraction detached from life. Students learn concepts but cannot apply them meaningfully. CBE's focus on transferability and context seeks to overcome this divide. Yet the critical question is not whether competence can include knowledge in theory but whether it does so in practice. When institutional accountability demands quantifiable results, complex forms of understanding are translated into simplified indicators. The richness of judgment collapses into the clarity of measurement.

Ainsworth's historical critique remains instructive. Writing in the 1970s, he warned that the behavioral definition of competence, while effective for training tasks, was "insufficient for intellectual education" because it fails to capture the reflective dimensions of understanding (Ainsworth, 1977). Modern CBE systems, even when they claim holistic intent, face similar challenges. The managerial need for comparability drives them toward simplification. Knowledge is incorporated only to the extent that it can be operationalized. In this process, its intrinsic value as a form of insight is lost.

Epistemically, competence differs from knowledge in its orientation toward performance. Knowledge seeks understanding; competence seeks adequacy. The two are not mutually exclusive, but their priorities diverge. A learner may demonstrate competence without genuine comprehension, just as one may understand deeply without immediate performance. The substitution of competence for knowledge thus redefines what counts as learning. It privileges *doing* over *thinking*, *use* over *truth*. Preston argues that this substitution leads to "ontological impoverishment," in which learning becomes functional adaptation rather than personal transformation (Preston, 2017).

The epistemic defense therefore overlooks a fundamental tension. Competence may require knowledge, but it instrumentalizes it. Knowledge becomes subordinate to performance goals. The reflective relation between knower and known—central to philosophical and humanistic traditions—dissolves into technical adequacy. Education becomes a system for producing capable agents rather than thoughtful persons.

7.4 The Pragmatic Defense: "Education Must Serve Reality"

The third defense of CBE is pragmatic. It holds that education must respond to the demands of the real world. In an era of rapid technological change and economic uncertainty, schools and universities cannot remain insulated from social needs. Competence-based frameworks are said to ensure relevance by aligning education with employment, innovation, and civic engagement. To oppose them, advocates claim, is to defend outdated elitism or academic abstraction.

Moon's analysis of global education reform captures the spirit of this defense. He notes that CBE emerged in part as a response to the "crisis of relevance" in traditional systems that failed to prepare learners for contemporary life (Moon, 2007). Governments and institutions adopted competency frameworks to link education with national development goals. This pragmatism is not inherently problematic; education must indeed address real human needs. Yet the problem arises when the definition of "reality" is narrowed to economic efficiency. The so-called real world is interpreted through the logic of markets, productivity, and competitiveness. The moral and cultural dimensions of human existence recede from view.

Schilling and Koetting observe that when educational design becomes a response to external demand, it loses its reflective autonomy (Schilling & Koetting, 2010). The pragmatic defense thus risks transforming education into a service industry. The institution no longer asks what kind of society education ought to create; it merely adapts to what society already is. This adaptation may appear realistic, but it eliminates education's critical function. As Habermas would argue, instrumental adaptation without reflection reproduces existing power structures. Education becomes conservative in the deepest sense: it preserves the present under the guise of innovation.

Preston deepens this critique by describing CBE as "a pedagogy of adjustment" that trains individuals to navigate systems rather than question them (Preston, 2017). The rhetoric of relevance thus conceals a loss of agency. Learners become efficient participants in the given order, not creators of new possibilities. The pragmatic defense mistakes adaptation for freedom. True education, as philosophers from Dewey to Freire have argued, must not only respond to the world but also transform it.

7.5 Reconciling Utility with Meaning

The persistence of these defenses shows that CBE addresses real anxieties about education's purpose. It responds to demands for fairness, clarity, and relevance. Yet its solutions tend to overcorrect. The organizational defense reduces purpose to structure, the epistemic defense subordinates knowledge to performance, and the pragmatic defense identifies value with utility. The challenge is to reconcile utility with meaning, to create systems that are both responsive and reflective.

Bagnall and Hodge propose an "epistemology of openness" as an alternative to both the rigidity of CBE and the abstraction of traditional schooling (Bagnall & Hodge, 2016). They argue that education must retain a dimension of uncertainty, where outcomes are not wholly predetermined. Learning should engage students in the construction of understanding rather than the reproduction of competencies. This approach accepts the practical insights of CBE—clarity, accountability, connection to context—while resisting its totalization. Competence can serve as a means within a broader conception of formation, but it cannot replace formation itself.

Reconciliation also requires rethinking the relationship between education and work. Instead of treating employability as education's ultimate end, institutions could treat it as one domain of human flourishing among others. The ability to think, to question, to imagine alternative futures remains as vital to social progress as technical proficiency. As Waghid argues, education achieves its highest purpose when it cultivates *practical reason*: the capacity to deliberate about the good in uncertain circumstances (Waghid, 2003). Such reason resists instrumentalization because it is oriented toward understanding rather than control.

The defenses of CBE reveal both the promise and the peril of educational reform in an age of management. Each defense begins with a legitimate concern—inefficiency, irrelevance, inequity—and ends by reinforcing the logic of instrumentality. The deeper problem is not CBE itself but the conception of reason that underlies it. When rationality is reduced to technique, purpose becomes indistinguishable from performance. Education can measure its success but not justify it. Addressing these defenses philosophically requires recovering the distinction between technical improvement and moral advancement. Technical systems can make education more efficient, but they cannot determine what education is for. Only reflective judgment—what Aristotle called *phronesis*—can do that. The task is to restore spaces within educational systems where such judgment can flourish. Without them, competence will continue to expand while understanding contracts. In this sense, the critique of CBE is not a rejection of competence but a defense of education's human vocation. To educate is to invite learners into the shared project of meaning-making, not merely to train them for measurable performance. The technical logic of competence can support this vocation only when subordinated to reflective reason. The danger lies in forgetting that distinction. When the measurable becomes the meaningful, education loses its soul.

8. Reclaiming Educational Purpose Beyond Competence

8.1 The Question of Recovery

To reclaim educational purpose beyond competence is to ask what kind of learning remains possible when performance ceases to be the final measure of value. The question is not whether competence should exist but whether education can still serve as a space for formation, reflection, and understanding. Competence describes what learners can do; purpose concerns what they ought to become. The challenge is to recover this dimension of *becoming* without rejecting the insights that have made CBE attractive to reformers.

The recovery of purpose requires a philosophical act of remembering. It demands that education re-engage with its moral and epistemic inheritance—the conviction that knowledge possesses intrinsic worth and that learning involves more than adaptation to social needs. Preston describes this recovery as a return to "the existential core of education," the recognition that learning is inseparable from the search for meaning (Preston, 2017). The recovery is not nostalgic but critical. It does not seek to restore an idealized past but to retrieve what has been lost: the idea that education is a mode of self-formation grounded in knowledge and reflection.

8.2 Bildung and the Ethics of Formation

The concept of Bildung offers one of the most profound frameworks for rethinking

educational purpose beyond competence. Originating in German idealism, Bildung denotes a process of self-cultivation through which the individual shapes both understanding and moral sensibility. It unites intellectual and ethical growth, linking the acquisition of knowledge with the development of character. In this tradition, education is not the transmission of skills but the cultivation of humanity.

Wilhelm von Humboldt, the architect of the modern university ideal, regarded Bildung as an activity of inner freedom. To be educated was to engage in an ongoing dialogue between self and world, mediated through knowledge. Humboldt insisted that the goal of learning was not utility but self-determination through reason. Knowledge served as the medium through which individuals could recognize their dependence and autonomy simultaneously. This vision contrasts sharply with CBE's logic of outcomes, where the learner's development is externally defined and evaluated.

Waghid's reinterpretation of R. S. Peters' non-instrumental justification of education aligns with this humanistic ideal. He argues that education must retain moral autonomy from economic or political utility (Waghid, 2003). Learning acquires meaning not through performance but through its contribution to reflective life. Education as Bildung is thus an ethical practice: it concerns how individuals come to inhabit the world responsibly. Competence, in this context, may be a by-product of formation, but it cannot replace it as purpose. Where competence aims for adequacy, Bildung seeks wholeness.

8.3 Knowledge as a Formative Good

Reclaiming educational purpose requires restoring the formative status of knowledge. Knowledge is not merely information or skill but a way of being oriented toward truth. It engages the learner in the labor of understanding, which includes uncertainty, interpretation, and transformation. The formative power of knowledge lies in its capacity to reshape perception and value. It allows individuals to encounter the unfamiliar, to revise assumptions, and to act with judgment.

Chappell, Gonczi, and Hager suggest that any authentic education must include the integration of knowledge, skill, and ethical reflection within situated practice (Chappell, Gonczi, & Hager, 2020). Their argument implies that competence is meaningful only when grounded in knowledge that extends beyond technical procedures. Knowledge provides the interpretive depth that enables learners to see the significance of what they do. Without this depth, competence risks becoming empty performance.

The recognition of knowledge as formative also challenges the dominance of instrumental reason. Magnusson and Osborne observe that modern education's crisis stems from the reduction of knowledge to utility, which impoverishes the intellectual and moral imagination (Magnusson & Osborne, 1990). To reclaim purpose, education must once again affirm knowledge as a public good rather than a private asset. This affirmation requires institutional courage: to defend the space of inquiry against the encroachment of measurement.

8.4 Restoring Openness and the Value of Uncertainty

Competency-based systems assume that effective education requires closure. Every learning process must be defined by explicit outcomes and measurable indicators. Yet genuine education depends on openness—the willingness to dwell with questions that cannot be resolved in advance. Learning is not linear progress toward mastery but an encounter with complexity. The recovery of purpose therefore entails revaluing uncertainty as an essential condition of learning.

Bagnall and Hodge describe this revaluation as an "epistemology of openness," which recognizes that education must include dimensions that cannot be codified (Bagnall & Hodge, 2016). Openness allows education to remain responsive to the unforeseen and the emergent. It resists the temptation to define outcomes exhaustively, preserving the space for interpretation. In this sense, uncertainty is not a defect but a virtue. It keeps education human by reminding us that learning is an unfinished dialogue between self and world.

Preston's existential critique reinforces this view. He warns that when learning is reduced to competence, education "ceases to acknowledge its own mystery" (Preston, 2017). The mystery he describes is not irrational but reflective. It refers to the openness that allows learners to ask why knowledge matters. To reclaim purpose, educational systems must create spaces where

learners and teachers can engage with questions that have no predetermined answers. Such spaces resist the closure of technical rationality and restore education's contemplative dimension.

8.5 The Role of Reflection in Educational Renewal

Reflection is the central act through which education transcends competence. It transforms performance into understanding and experience into meaning. Reflection enables learners to connect what they do with who they are becoming. In CBE systems, reflection is often reinterpreted as "self-assessment," a procedural activity focused on identifying strengths and weaknesses. While such exercises have value, they do not capture the deeper philosophical meaning of reflection as the capacity to examine one's assumptions, values, and purposes.

Waghid's work on *practical reason* offers a framework for this deeper understanding. Practical reason involves deliberation about what is good or right in particular contexts. It requires engagement with ethical and political questions, not merely technical decisions. Education that fosters practical reason cultivates learners who can act with judgment rather than mere competence (Waghid, 2003). Reflection thus becomes a moral practice that anchors knowledge in responsibility.

Institutions can nurture reflective learning by creating pedagogies that privilege dialogue over compliance. The Socratic method, project-based inquiry, and philosophical discussion are examples of practices that engage students in interpretive reasoning. These methods reassert the teacher's role as a guide in meaning-making rather than an assessor of outcomes. They also reframe assessment itself as a conversation about understanding rather than a certification of performance. Through such reorientation, reflection becomes the bridge between competence and purpose.

8.6 Integrating Accountability with Formation

Reclaiming educational purpose does not mean abandoning accountability. Institutions must still ensure that learning achieves recognizable outcomes. The challenge is to balance accountability with formation, efficiency with openness. Preston argues that this balance is possible only if institutions treat measurement as servant rather than master (Preston, 2017). Assessment should illuminate learning, not define it.

Accountability can support formation when it respects the qualitative nature of knowledge. Evaluative practices that include narrative feedback, dialogical evaluation, and portfolio-based assessment can capture dimensions of learning that standardized tests miss. Such methods recognize that competence is meaningful only when situated within a story of growth. They allow for diversity of interpretation while maintaining rigor.

Chappell, Gonczi, and Hager's conception of competence as holistic integration provides a model for this reconciliation. Their framework acknowledges the importance of measurable outcomes but situates them within broader educational values. It invites educators to design learning experiences that cultivate both skill and understanding, both performance and reflection (Chappell, Gonczi, & Hager, 2020). When accountability is redefined in this way, it can coexist with Bildung. It can help sustain a culture of responsibility without erasing the mystery of learning.

8.7 Education as an Ethical Encounter

The deepest justification for reclaiming educational purpose beyond competence lies in the ethical nature of education itself. Education is not a transaction but an encounter between persons. It involves trust, care, and dialogue. These relations cannot be codified into competencies. They arise from the recognition of the learner as a moral subject rather than a unit of performance. When education is reduced to competence, this ethical encounter is obscured.

Bagnall and Hodge remind us that the ethical dimension of education is expressed in its refusal to close meaning (Bagnall & Hodge, 2016). Teachers who engage learners as partners in inquiry affirm the humanity of both. Such encounters restore education's vocation as a space for mutual transformation. The teacher becomes a witness to the learner's unfolding rather than a manager of outcomes. The student becomes a participant in shared understanding rather than a recipient of training.

This ethical vision repositions competence as a by-product of relational engagement rather than its aim. Competence follows from dialogue because it arises from understanding. When learners grasp the meaning of their actions, they act competently as a natural extension of judgment. The restoration of ethical encounter therefore completes the reclamation of purpose.

It binds knowledge, reflection, and responsibility into a coherent whole.

To imagine education beyond competence is to imagine a future in which learning remains accountable yet open, practical yet reflective. The task is not to reject modern reforms but to infuse them with philosophical depth. Systems of accountability can coexist with cultures of inquiry if they acknowledge that not all value is measurable. Institutions can honor transparency without erasing mystery. Preston envisions such a future as a dialogue between measurement and meaning. He writes that "education must become a practice of translation between the quantifiable and the unquantifiable" (Preston, 2017). This translation is the work of teachers, scholars, and policymakers who recognize that education is both a science and an art. The art lies in discerning when to measure and when to let learning breathe. The future of educational purpose depends on recovering the courage to ask questions that systems cannot answer: What is the good life? What is worth knowing? What does it mean to be human? These questions, neglected by CBE's technical rationality, remain the heartbeat of education. To reclaim them is to reclaim the soul of learning.

Reclaiming educational purpose beyond competence is a philosophical and ethical project. It calls for a reorientation of educational thought from performance to understanding, from outcomes to formation, from measurement to meaning. Competence, while valuable, cannot bear the full weight of educational purpose. It must be situated within a larger framework that honors knowledge as formative, reflection as moral, and learning as open-ended. The recovery of Bildung and the reaffirmation of knowledge as a formative good offer pathways to this renewal. By integrating accountability with openness and technique with reflection, education can regain its human vocation. In this vision, competence serves understanding, and understanding serves freedom. The true purpose of education lies not in producing what can be measured but in cultivating what can be imagined.

9. Conclusion

Competency-Based Education emerged as a rational response to legitimate concerns about efficiency, fairness, and employability. Yet its success as a policy framework conceals a deeper philosophical cost: the reduction of education's purpose to performance. The shift from knowledge to competence redefines the aims of learning in ways that mirror the logic of production and management.

The critique advanced here does not deny the value of competence. It calls for a rebalancing between technical proficiency and intellectual formation. Education must remain a space where knowledge is pursued not only for its outcomes but for its contribution to understanding and human flourishing. As Magnusson and Osborne remind us, the challenge is not to abolish competence but to prevent its elevation into an unquestioned ideology (Magnusson & Osborne, 1990).

In an age dominated by metrics and accountability, reclaiming educational purpose requires philosophical vigilance. Education must resist the temptation to define itself solely by what can be measured. Its true purpose lies in nurturing the capacities for judgment, imagination, and meaning that make learning an enduring human endeavor.

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PIONEER
ACADEMIC PUBLISHING LIMITED

Journal of Advanced Research in Education
ISSN 2709-3980
www.pioneerpublisher.com/jare
Volume 4 Number 6 November 2025

The Comparison of the Effects of Parent-Child and Teacher-Child Relationships on Chinese Preschoolers' Social Emotional Abilities

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doi:10.56397/JARE.2025.11.04

Abstract

This study compared the effects of parent-child and teacher-child relationships on Chinese preschoolers' social emotional abilities. Participants were 211 children from different preschools in a small city of Henan Province, China. Parents rated the parent-child relationships and children's social emotional abilities at home and teachers rated the teacher–child relationships at school. After controlling for family socioeconomic status, the results showed parent-child relationship was a stronger predictor on preschool children's social emotional abilities than was teacher-child relationship. Parent-child closeness positively predicted self-management, prosocial behavior and social skills and negatively predicted problem behavior. Parent-child conflict positively predicted problem behavior and negatively predicted self-management, prosocial behavior and social skills. While teacher-child relationships did not significantly predict children's social emotional abilities. The findings highlight the importance of parent-child closeness in children's early social emotional abilities.

Keywords: parent-child relationship, teacher-child relationship, social emotional ability

1. Introduction

Children's social emotional development influences the extent to which they get on well with other children and adjust well in their preschools. It also influences some other skills they have to learn, such as cognitive skills (OECD, 2020). Moreover, the development of children's early social-emotional skills has long-lasting influence on a range of later outcomes, such as life satisfaction, educational attainment, employment and social-economic status (Tamara, G. H., & Kristen E. D., 2016). Since social and emotional abilities are meaningful for both individuals' well-being and the whole society, government and organizations these years became more concerned about promoting social emotional learning programs in early years (Repetti, R. L., Sears, M. S., & Bai, S., 2015). To better improve the quality of early social emotional learning, it's essential to find out factors that influence preschool children's social emotional abilities.

A number of factors were found to be linked to children's social emotional abilities. Some family factors like family socioeconomic status, parental engagement and parenting style were

linked to children' social emotional abilities (Sheridan, S. M., Knoche, L. L., Edwards, C. P., Bovaird J. A., & Kevin. A. K., 2010; Brook, B., 2011; Pianta, R. C., Nimetz, S. L. & Bennett, E., 1997). Other factors like interpersonal relationships, such as parent-child relationships, peer relationships and teacher-child relationships, were also associated with children's social emotional abilities (Liu L., He, X., Li, C., Xu, L. & Li, Y., 2020; Hamre, B. K., & Pianta, R. C., 2001). Among the factors above, as two main interpersonal relationships, the parent-child relationships and the teacher-child relationships were strongly associated with children's early social and emotional skills. (Li Y., Liu, L., Lv, Y., Lo, F. & Wang, Y., 2015; Li, J., 2021)

Since the second half of the 20th century, home-school cooperation has increasingly become a trend in the world to solve the problems of early year's education quality (Bowlby, J., 1982). During the process of cooperation, what aspects should parents focus on and what aspects should schools focus on? Between parents and teachers, if we can identify who played a more important role in certain aspects of child development, the home-school cooperation will be more effective. While limited research has compared the effects of parent-child and teacher-child relationships on preschoolers' social emotional abilities. Therefore, the purpose of the present study is to examine, between parent-child relationships and teacher-child relationships, which factor influence preschoolers' social emotional abilities more.

1.1 Parent-Child Relationships and Social Emotional Abilities

Attachment theory offers one of the frameworks to understand children's social and emotional abilities. Bowlby (1982) posits that parent-child relationships play a key role in children's later social adaptation and personality development (Brumariu, L. E., 2015). Previous research has shown children who experienced securely attached parent-child relationships are able to employ effective emotion regulation strategy (Bernstein, V. J., Hans S. L., & Percansky C., 1991). Children with high-level parent-child closeness also demonstrate better interpersonal character and peer acceptance (Lai, A., Chui, C., Lo, P., Porter, J. & Chan, C., 2017). For children at risk for developing social skills or with other developmental problems, a positive caregiver-child relationship is able to have a buffering effect (Kim, S. & Kochanska, G., 2012; Simona, S. & Marcella, C., 2018).

A negative parent-child relationship, on the other hand, is often linked to social emotional problems or challenges. Previous research has shown children who experienced parent-child conflict tend to deficit in behavior regulation (Birch, S. H. & Ladd, G. W., 1997). Children with high-level parent-child conflict also demonstrate lower peer acceptance and lower academic achievement (Zhang, X., & Nurmi, J. E., 2012). In addition, a previous study has demonstrated that the interaction between psychopathological symptoms and a conflictual parent-child relationship negatively predict children's social skills and coping strategy (Acar, I.H., Kutaka, T.S., Rudasill, K.M. et al., 2020). Considering that parent-child relationships play a key role in children's social and emotional developmental outcomes, the current study would focus on the effects of parent-child relationships on social emotional abilities.

1.2 Teacher-Child Relationships and Social Emotional Abilities

Given that children spend most of the time in preschools, teacher-child relationship is a primary factor that affects children's social emotional abilities. Previous research has shown that teacher-child closeness was positively related to children's school adjustment, such as academic performance, school liking and self-directness (Ferreira, T., Cadima, J., Matias, M., Vieira, J. M., Leal, T., & Matos, P. M., 2016). High closeness in teacher-child relationships predicted better social competence and prosocial behavior (Zhang X., Chen H.C. & Zhang G. F., 2008; Wang, W. C., 2017; Howes, C., Matheson, C. C., & Hamilton, C. E., 1994).

In contrast, a negative teacher-child relationship, was often associated with social and emotional problems. Previous research has shown teacher-child conflict in children's early year childhood predicted their problem behaviors (Sisson, J., 2014; Zatto, B. L. & Hoglund, W. G., 2019). Children at higher-level teacher-child conflict demonstrated more aggressive behavior (Davis, P. E., 2005). Previous study also has shown that teacher-child conflict was significantly correlated to children's internalizing, externalizing problems and peer behavior (Pianta, R. C., & Steinberg, M. S., 1992; Zhang, X., & Sun, J., 2011; Zhang, X., & Chen,

H., 2010). Therefore, the quality of teacher-child relationship was also a primary factor on children's social emotional abilities in this study.

1.3 The Current Study

To sum up, the present study addresses two questions:

(1) What are the correlations between parent-child relationships, teacher-child relationships and different dimensions of social emotional abilities?

(2) To what extent are parent-child relationships and teacher-child relationships related to different dimensions of social emotional abilities? Do parent-child relationships influence preschoolers' social emotional abilities more or teacher-child relationships influence preschoolers' social emotional abilities more?

2. Method

2.1 Participants

211 children (54% middle class, 46% senior class) were randomly selected in 8 different classes across 4 preschools in a small city in Henan Province, China. Information was obtained from one of their parents and from their preschool homeroom teachers (n=8).

In the preschools, each class includes about 20-30 children, 1 homeroom teacher and 1 assistant teacher. Only homeroom teachers participated in this research, because they were mainly responsible for all the children in the class, and they were the most familiar with the children. In terms of the parent sample, among the fathers, 15.2% didn't complete high school, 53% graduated from high school, and 31.8% had bachelor's degree and above. Among the mothers, 13.7% didn't complete high school, 50.3% completed high school degree, and 36% had bachelor's degree and above.

2.2 Measures and Procedures

2.2.1 Control Variables

As family social economic status and parental engagement can often be seen as factors that have impacts on children's early social emotional skills, parents' educational levels, educational investment and parental time with children were considered as control variables in this study.

1) Parents' educational level. The parents reported their educational levels (1= junior high school and below, 2= senior high school, 3= bachelor's degree and above). In this study, referring to Davis- Kean (2005)'s research, the higher educational attainment of parents was used as an indicator of family education (Behar, L. B., & String Beld, S., 1974).

2) Educational investment. Parents were asked to report annual cost on their children's education by filling blanks. This investment includes children's tuition fee and cost of purchasing books, magazines, school things and other leaning materials.

3) Parental time with children. Parents were asked to report how many hours they spend in accompanying children every day by filling blanks. The accompanying activities include learning, playing, chatting and watching TV with children when they are awake.

2.2.2 Teacher-Child Relationships

In order to measure teacher-child relationships, the Chinese version of Pianta and Steinber's (1992) Student-Teacher Relationship Scale was used in this study, which has showed good reliability and validity in the past research (Rohlf, F. J. & Sokal R.R., 1995; Main, M., Kaplan, N. & Casseidy, & J., 1985). It consists of the Closeness and Conflict subscales. The Closeness subscale (11items) measures close and affectionate relationship between a child and a teacher. (e.g. This child always naturally shares some information about herself with me.) The Conflict subscale (12 items) measures conflictual and even hostile relationship between a teacher and a child (e.g. this child thinks I always punish and criticize him/her). Teachers reported their relationships with children on a 5-point Likert scale that ranges from 1 (definitely not apply) to 5 (definitely not apply). Good parent-child relationships are defined by high closeness and low conflict. In this study, the Cronbach's α coefficients are .76 for closeness and .83 for conflict.

2.2.3 Parent-Child Relationships

Parent-child relationships were assessed by Chinese version of Pianta and Steinberg (1992)'s Child-parent Relationship Scale (CPRS), which was previously proved to be reliable in Chinese context (Spivak, A., & Howes, C., 2011). It also includes the Closeness subscale and Conflict subscale. The Closeness subscale measures a warm and affective relationship between the parent and the child, and the Conflict subscale measures the conflict and disharmony between them. An example of items for closeness (9 items) is my child always asks me for comfort

when he or she feel upset. An example of items for conflict (11 items) is my child always thinks I treat him/her unfairly. Good parent-child relationships can be defined by high level of closeness and low level of conflict. In this study, the Cronbach's α coefficients for parent-child closeness is .74 and for parent-child conflict is .80.

2.2.4 Social Emotional Abilities

To assess children's social emotional abilities, Behar's (1974) Children's Behavior Questionnaire (PBQ) was adapted. In this study, the whole social emotional ability scale was divided into four subscales including 38 items: self-management (11 items), problem behavior (17 items), social skills (7 items) and prosocial behavior (3 items). Parents reported children's behaviors on a 4-point scale (1= very not similar, 2= not similar, 3= similar, 4= very similar). For self-management, prosocial behavior, problem behavior and social skills, higher scores mean that children have better social emotional abilities. For problem behavior, lower scores mean that children have better social emotional abilities. The Cronbach's α coefficient of the social emotional ability scale is .70.

2.2.5 Procedures

Around April 2021, participating parents received the questionnaires that assess children's social emotional abilities, parent-child relationships and consent forms. After finishing the questionnaires, parents returned them to the homeroom teachers. The teachers completed the questionnaires that measure teacher-child relationships. All data were collected within one week.

2.3 Control of Common Method Variance

In the present study, participating parents need to complete both social emotional ability and parent-child relationship questionnaires. To avoid the common method variance, the method of Harman's single-factor test was used. A single factor will appear and explain most of the covariance in the predictor and outcomes variable as long as there is common method variance in this study. After using factor analysis, 17 factors were extracted and greater than one and the proportion of Factor 1 is 21.75% (less than 40%). This means common method variance doesn't influence the result of this study.

3. Results

Table 1. Means, standard deviations and correlations among teacher-child relationships, parent-child relationships and social emotional abilities

	M(SD)	1	2	3	4	5	6	7	8	9	10	11
Parents' educational level	2.35 (.65)	1										
Educational investment (thousand/yuan)	18.32 (13.68)	.27**	1									
Parental time with children (hour)	5.34(2.60)	-.11	-.10	1								
Parent-child closeness	36.56 (4.89)	.10	.15*	.10	1							
Parent-child conflict	24.27 (6.64)	.00	-.03	.01	-.29**	1						
Teacher-child closeness	37.74 (5.77)	.09	.12	.06	.19**	-.01	1					
Teacher-child conflict	19.94 (5.41)	.08	.04	-.10	-.09	.18**	.09	1				

Self-management	31.51 (4.71)	.07	.01	.02	.30**	-.56**	.05	.10	1			
Prosocial behavior	10.44 (1.62)	.04	.13	.07	.40**	-.36*	-.10	-.14*	.44**	1		
Problem behavior	28.39 (7.27)	-.19**	-.09	-.07	-.37**	.64**	-.11	.17*	-.61**	-.48**	1	
Social skills	21.32 (3.40)	.07	.14*	.05	.39**	-.30**	.18**	-.02	-.26**	.43**	.33**	1

* p<0.05 ** p<0.01.

Overall means and standard deviations of children's social emotional abilities were shown in Table 1. Table 1 also presents the correlations among control variables, relationship variables, and children's social emotional abilities through Pearson correlation analysis. The results are summarized in Table 1. For control variables, parents' educational levels were negatively related to problem behavior, and educational investment was positively related to social skills. However, there were no relations among parental time with any dimensions of social emotional abilities.

For parent-child relationships, parent-child closeness was positively correlated with three domains of social emotional abilities-self-management, prosocial behavior, and social skills and negatively correlated with problem behavior. Meanwhile, parent-child conflict was negatively correlated with three domains of social emotional abilities-self-management, prosocial behavior, and social skills, and positively correlated with problem behavior.

For teacher-child relationships, teacher-child closeness was positively related to social skills. In addition, teacher-child conflict was positively associated with problem behavior and negatively associated with prosocial behavior.

Table 2. Multilevel regression analysis: control variables, children's interpersonal relationships and social emotional abilities

	self-management		prosocial behavior		problem behavior		social skill	
	β	ΔR2	β	ΔR2	β	ΔR2	β	ΔR2
Model 1	.01		.02		.05**		.03	
Parents' education level	.10		-.00		-.20***		.03	
Investment in education	-.06		.08		.01		.07	
Parental time with children	.03		.05		-.06		.02	
Model 2	.35***		.21***		.43***		.18***	
Parent-child closeness	.17**		.31***		-.18***		.30***	
Parent-child conflict	-.52**		-.25***		.56***		-.22***	
Model 3	.00		.01		.01		.02	
Teacher-child closeness	-.00		.02		-.06		.12	
Teacher-child conflict	.01		-.07		.07		.04	

* p<0.05 ** p<0.01 ***p<0,001.

To compare the effects of teacher-child relationships and parent-child relationships on

children's social emotional abilities, multilevel regression was conducted. Parents' educational level, educational investment and parental time with children were first entered as control variables in the regression. Then parent-child closeness and parent-child conflict were entered. Finally, teacher-child closeness and teacher-child conflict were entered. Multicollinearity was diagnosed in each model using the variance inflation factor (VIF) test. In each model, all VIFs were < 5, which indicated no serious multicollinearity in these regression models (As a rule of thumb, a VIF > 10 indicates serious multicollinearity). The final regression model of social emotional abilities is presented in Table 2.

As shown in Table 2, after controlling for parents' educational level, educational investment and parental time with children, parent-child closeness significantly and positively predicted three dimensions of social emotional abilities-self-management, prosocial behavior, and social skills, and negatively predicted problem behavior. Besides, parent-child conflict significantly and negatively predicted three dimensions of social emotional abilities-self-management, prosocial behavior, and social skills, and positively predicted problem behavior. In contrast, both teacher-child closeness and teacher-child conflict didn't predict four dimensions of social emotional abilities.

4. Conclusions

This study is designed to examine the effects of parent-child relationships and teacher-child relationships on different dimensions of children's social emotional abilities.

First, parent-child closeness was markedly related to all dimensions of social emotional abilities, positively with self-management, social skills and prosocial behavior and negatively with problem behavior. Meanwhile, parent-child conflict was also significantly related to all dimensions of social emotional abilities, negatively with self-management, prosocial behavior and social skills, and positively with problem behavior. These findings are in line with attachment theorists' viewpoints (Bowlby, J., 1982). They posit that the quality of caregiver-child relationships significantly contributes to children's social adaptation.

Second, teacher-child closeness was positively correlated with social skills. In order to promote preschool children's social skills, teachers had better establish close teacher-child relationships and provide emotional support to children. Besides, teacher-child conflict was positively related to problem behavior and negatively related to prosocial behavior. Similarly, Ferreira et al's (2016) also found teacher-child relationships were linked to children's prosocial behavior (Ferreira, T., Cadima, J., Matias, M., Vieira, J. M., Leal, T., & Matos, P. M., 2016). As children spend much time learning in preschool and having interactions with teachers and peers, teachers can play a part in promoting children's positive social changes by building behavioral expectations and delivering daily teaching activities.

Last but not least, the findings suggest that parent-child relationships contribute more than teacher-child relationships on all dimensions of children's social emotional abilities. Parent-child relationships significantly predict all dimensions of children's social emotional abilities. Parent-child closeness positively predicted self-management, prosocial behavior, and social skills and negatively predicted problem behavior. However, teacher-child relationships didn't predict any dimensions of social emotional abilities. The finding is similar with Pianta et al. (1997)'s research showing that mother-child relationship was a stronger predictor to school adjustment behavior than was teacher-child relationship (Pianta, R. C., Nimetz, S. L., Bennett, E., 1997). It should be noted that the finding is inconsistent with Zhang et al.'s (2008) research showing that teacher-child relationship is a better predictor. Zhang et al. posit that teacher-child conflict could negatively predict preschool beginners' problem behavior and moderate the association between mother-child relationship and children's externalizing and internalizing problems (Zhang X., Chen H.C. & Zhang G. F., 2008). The different findings might be due to the age of the participants. In Zhang et al.'s research, the participating children were newly enrolled preschoolers and in Pianta et al.'s research and this research, the preschoolers were all between four to five years old. Another explanation is that this survey is conducted just after the COVID-19 pandemic, and the result may be influenced by this special factor. The participating children are in the second and third preschool year and the data was collected in April 2021, while in the whole year of 2020, children spent more time learning online at

home with their parents because of the lock-down and suspended class policy in China. Nevertheless, the possible contextual reasons actually can enlighten our understanding and the results can still show the importance of parent-child relationships in preschool children's social emotional abilities. Parents and teachers should be aware of the key roles of parent-child closeness in children's social emotional abilities in the process of home-school cooperation, especially during the present epidemic period.

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PIONEER
ACADEMIC PUBLISHING LIMITED

Journal of Advanced Research in Education
ISSN 2709-3980
www.pioneerpublisher.com/jare
Volume 4 Number 6 November 2025

Douyin Microlearning and Academic Performance: A Critical Reflection on Digital Learning in Chinese Higher Education

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doi:10.56397/JARE.2025.11.05

Abstract

The rapid digital transformation of Chinese higher education has redefined how students access, process, and value knowledge. Among emerging technologies, Douyin (the Chinese version of TikTok) has become a powerful medium for informal learning, merging entertainment with education through its algorithm-driven microlearning environment. This paper examines Douyin's growing influence on academic culture, exploring its pedagogical logic, ethical implications, and policy significance. It argues that while Douyin democratizes learning by expanding accessibility and engagement, it simultaneously fragments attention and challenges traditional ideals of endurance and moral cultivation rooted in Confucian educational philosophy. Drawing on recent studies and national reports, the analysis situates Douyin within China's broader *Education Digitalization Strategy 2035*, identifying both opportunities and risks in the convergence of social media and higher education. The study concludes that the key to sustainable digital learning lies not in rejecting short-video formats but in humanizing them—embedding reflection, integrity, and depth within the accelerating tempo of modern knowledge consumption.

Keywords: Douyin microlearning, digital pedagogy, Chinese higher education, attention economy, algorithmic governance, Confucian learning tradition, educational ethics, Education Digitalization Strategy 2035

1. Introduction

Chinese higher education is entering a stage of accelerated and irreversible digital change. Over the past decade, the country's universities have undergone a profound transformation driven by policy, technology, and social demand. Classrooms once centered on textbooks and lectures are now increasingly mediated by online learning platforms, mobile applications, cloud-based resources, and data-driven teaching systems. The government's *Education Informatization 2.0 Action Plan* (2018) and *Education Digitalization Strategy 2035* (2022) have provided both direction and legitimacy for this shift, emphasizing the creation of "intelligent learning environments" and "integrated digital ecosystems" capable of supporting equitable, lifelong education. These national strategies have turned digitalization from a peripheral innovation into a core element of educational

modernization.

Within this transformation, Douyin (the Chinese version of TikTok) has emerged as an unexpected yet powerful actor. Originally designed as an entertainment app, Douyin has evolved into a hybrid space where information, communication, and learning converge. Its algorithmic architecture—driven by personalization, short duration, and visual immediacy—has created a new rhythm of learning for young people. As the *52nd Statistical Report on Internet Development in China* (CNNIC, 2023) indicates, the country now has more than 1.04 billion short-video users, and over 70 percent of them use Douyin. Among this vast user base, about one-third are aged between 18 and 24, a demographic that aligns almost perfectly with the university student population.

The scale of Douyin's penetration into student life is transforming how knowledge is encountered. A 2022 *iResearch* survey reported that approximately 68 percent of college students viewed educational or informational content on Douyin at least once a week, ranging from exam tips and language tutorials to scientific explanations and current affairs commentary. This shift toward microlearning—short, visually stimulating, and emotionally engaging encounters with knowledge—reflects a broader trend in which learning becomes embedded in daily digital behavior rather than confined to formal academic spaces. For many students, Douyin is no longer merely a distraction between classes but a supplementary learning environment that fills the interstices of time—between commutes, meals, or study breaks.

The appeal of Douyin lies in its immediacy. Its algorithm continuously curates content aligned with users' preferences, rewarding attention with novelty and gratification. The cycle is fast and addictive: videos last seconds, feedback is instant, and engagement is quantified through likes and shares. While this system creates opportunities for personalized learning and autonomous exploration, it also promotes what cognitive psychologists term "attention fragmentation"—a mode of engagement defined by rapid switching and shallow focus. Learning becomes episodic rather than sustained, emotional rather than reflective. A 2023 study by *Tsinghua University's Center for Learning Science* found that students who spent more than 90 minutes per day on short-video platforms reported a 22 percent lower self-assessed concentration span compared with peers who primarily studied through long-form materials.

This transformation challenges deeply rooted cultural understandings of education in China. For centuries, the Confucian learning tradition has emphasized patience, endurance, and the cultivation of moral character through disciplined study. Education was viewed as a lifelong process of self-refinement rather than an accumulation of information. The microlearning model introduced by Douyin disrupts this continuum: it fragments time, compresses complexity, and rewards immediacy. The tension between the traditional ethics of endurance and the digital culture of acceleration now defines much of the debate surrounding educational reform.

For educators and policymakers, the emergence of Douyin as a learning space presents both promise and concern. On one hand, it democratizes access to knowledge by lowering entry barriers—anyone with a smartphone can learn at any time. On the other, it reconfigures cognitive habits, replacing sustained effort with instant gratification. The challenge for universities is therefore not simply how to regulate students' digital behavior, but how to reimagine learning culture itself—how to preserve depth, reflection, and intellectual integrity within a society increasingly organized around speed.

In this new landscape, the boundaries between formal and informal learning are dissolving. Douyin functions simultaneously as a classroom, a community, and a marketplace of ideas, where algorithms, not teachers, often determine what knowledge is visible. As higher education in China continues to evolve, understanding this transformation becomes crucial. The platform represents more than a technological shift; it embodies a cultural reorientation toward learning as an experience of immediacy. The meaning of academic achievement—once measured by endurance, mastery, and moral cultivation—is being renegotiated in the fast tempo of digital modernity. Whether Douyin ultimately enhances or diminishes education will depend on how China's universities, educators, and policymakers respond to this new rhythm of learning—not by rejecting it, but by shaping it toward reflective, humane, and ethically grounded ends.

2. Pedagogical Logic of Microlearning

2.1 Constructivist Roots and the Promise of Learner Autonomy

Microlearning rests on the same philosophical and pedagogical foundations that shaped the rise of modern constructivist thought, emphasizing learning as a process of active meaning-making rather than passive reception. From Piaget's concept of cognitive construction to Vygotsky's theory of the social zone of proximal development, constructivism posits that knowledge emerges from interaction—between the learner, the environment, and the social context of learning. Within this framework, Douyin-based microlearning appears not as a disruption but as a continuation of this tradition, adapted to the rhythm and attention span of a generation raised in digital environments.

In constructivist learning, knowledge is built through exploration, experimentation, and reflection. Douyin's short, modular videos naturally lend themselves to these processes. Each clip represents a discrete "micro-unit" of learning that learners can engage with autonomously—pausing, replaying, or skipping according to their needs. Instead of following a rigid curriculum, students create personalized learning paths by choosing topics and formats that resonate with their goals and interests. This aligns with learner-centered education, where agency and choice play central roles in sustaining motivation and cognitive engagement.

Recent studies have illustrated the growing resonance of this model with Chinese university students. A *2023 China Youth Daily* survey reported that 62.4 percent of undergraduates preferred "flexible and self-paced learning methods" to traditional lectures, specifically citing short-video learning as a model that allows for individualized pacing and repetition. Similarly, a *Shanghai Education Research Institute* report (2023) found that over half of surveyed students believed Douyin's micro-tutorials "helped improve comprehension of complex topics" because they could revisit explanations multiple times at their own pace. In essence, the attraction of Douyin lies not only in its entertainment value but in the perceived empowerment it offers—the ability to manage one's own learning process within the constraints of everyday life.

This growing sense of autonomy reflects a deeper transformation in the student's role. In traditional classrooms, knowledge flows hierarchically from teacher to learner. In the Douyin ecosystem, however, knowledge is decentralized and participatory. Students encounter multiple "teachers"—content creators, peers, and even algorithmic curation systems—and must actively discern, evaluate, and connect information across contexts. This participatory form of engagement reflects the constructivist emphasis on active learning, where understanding is co-created through interaction and contextual adaptation rather than imposed externally.

The algorithmic structure of Douyin introduces a dimension of connectivism, a theoretical extension of constructivism formulated by George Siemens (2005) and Stephen Downes (2012). Connectivism asserts that knowledge does not reside solely within individuals but within networks of people, digital systems, and information flows. Learning, therefore, becomes the act of navigating and linking nodes within this network. On Douyin, learners traverse an ever-shifting web of educational creators, hashtags, and algorithmic pathways that collectively form a decentralized learning ecosystem. A student might begin by watching a brief English grammar video, then be led by algorithmic recommendations to related content on writing techniques, public speaking, or cultural idioms. Through this process, learning becomes networked, adaptive, and fluid—mirroring the connectivist vision of education in the information age.

However, this autonomy also requires new forms of cognitive discipline. While Douyin provides freedom to explore, it also exposes learners to overabundance and distraction. Without guidance, students may fall into what education psychologist Chen Li (2022) calls "nonlinear drift"—an unfocused browsing pattern where interest dissipates before deep understanding forms. The constructivist promise of autonomy thus depends on metacognitive regulation, or the ability to organize fragmented learning experiences into meaningful structures. Educators play a critical role in cultivating this capacity, helping students move from impulsive consumption to deliberate synthesis.

Microlearning's brevity, often viewed as a limitation, can also be reframed as a pedagogical

opportunity. Its concise format encourages immediate engagement and iterative learning, allowing students to build understanding gradually through repetition and contextual layering. When learners connect short segments over time—each reinforcing or expanding upon the previous—they participate in a process of cumulative construction akin to what Jerome Bruner described as the "spiral curriculum." In this sense, Douyin's learning potential lies not in the individual clip but in the networked accumulation of experiences across time and context.

Still, realizing this potential requires institutional and pedagogical adaptation. Universities must design scaffolded frameworks that bridge informal and formal learning. For instance, some Chinese instructors now ask students to compile playlists of educational Douyin clips relevant to weekly course themes, annotate them critically, and present their reflections in class discussions. Such activities encourage learners to exercise autonomy within structure, merging personal exploration with academic discipline.

2.2 Tension Between Brevity and Depth in Chinese Learning Traditions

The culture of learning in China has long valued perseverance and gradual accumulation of knowledge. Rooted in Confucian ideals, education has traditionally been understood as a moral and intellectual journey requiring patience, repetition, and self-discipline. Classical sayings such as "study without rest" (*xue er bu yan*) and "review the old to know the new" (*wen gu er zhi xin*) emphasize sustained effort and reflection as the foundation of wisdom. Within this context, the popularity of Douyin's microlearning model introduces a subtle but significant challenge: it promotes learning through immediacy rather than endurance.

The structure of Douyin favors brevity—videos often last less than one minute and are designed to capture attention instantly. This rhythm rewards quick comprehension, emotional resonance, and visual appeal. While such accessibility opens new doors for informal learning, it also encourages cognitive shortcuts. Students may absorb surface-level information without the deeper analytical processing required for long-term understanding. A 2023 Tsinghua University study on short-video learning found that college students who relied heavily on Douyin for study aids tended to retain factual details but struggled to explain underlying concepts or relationships. The study noted that "speed replaces depth" when learners depend on algorithmic guidance rather than deliberate reflection.

This new mode of learning, shaped by algorithms and instant gratification, can erode the traditional virtues that once defined Chinese education. In classrooms where teachers used to emphasize endurance and mastery, students increasingly expect efficiency and stimulation. Knowledge is judged by its immediate usefulness or entertainment value rather than its capacity to cultivate character or deep reasoning. The Confucian pursuit of *jing* (精)—precision and refinement through repeated practice—faces competition from a culture of *su* (速)—speed and instant outcomes.

For educators, the dilemma is not whether to accept or reject microlearning but how to reconcile it with enduring values of intellectual rigor. Some universities have begun experimenting with integrating short-form content into longer study cycles, using Douyin clips as entry points to broader discussions or projects. Such approaches attempt to restore a balance between flexibility and depth: using brevity to attract interest, and depth to sustain meaning. The tension between the two forms of learning may never disappear, but managing it thoughtfully could lead to a more adaptive model of education—one that honors tradition while responding to the realities of digital attention.

3. Douyin as a Learning Ecosystem

Douyin's rise within China's digital landscape has blurred the distinction between entertainment, information, and education. What began as a leisure platform has gradually evolved into an informal learning ecosystem—an expanding space where knowledge circulates through creators, algorithms, and communities of users. In this environment, learning no longer depends solely on institutions or classrooms but unfolds continuously through mobile screens and algorithmic feeds.

Over recent years, the scale of Douyin-based learning has grown remarkably. The *2023 Douyin Education Report* estimated that over 320 million users had engaged with some form of educational or skill-oriented content,

representing a 25 percent increase from the previous year. According to the *52nd Statistical Report on Internet Development in China* (CNNIC, 2023), short-video users now exceed 1.04 billion, and Douyin accounts for more than 70 percent of that total. Among these users, approximately one-third are aged between 18 and 24, overlapping directly with the university population. Surveys by iResearch (2022) show that around 68 percent of Chinese college students have used Douyin to access educational or informational videos at least once a week. Study-related hashtags such as *#StudyTogether* and *#PostgraduateExamTips* have together generated over 1.2 billion views, creating a virtual peer-learning space integrated into students' daily routines.

These figures highlight how deeply Douyin has become embedded in China's informal learning culture. Table 1 summarizes key indicators that outline the platform's educational reach and associated challenges.

Table 1. Indicators of Douyin-Based Learning Engagement Among Chinese College Students (2022–2023)

Indicator	Data Source	Year	Key Findings	Analytical Relevance
Total short-video users in China	CNNIC, *52nd Statistical Report on Internet Development in China*	2023	1.04 billion short-video users nationwide; Douyin accounts for ≈ 70 %.	Shows Douyin's dominance as a learning-accessible platform.
College student users (aged 18–24)	CNNIC; Douyin Education Report	2023	≈ 32 % of Douyin's active users fall within this demographic.	Confirms overlap with higher-education population.
Students using Douyin for educational purposes	iResearch Survey	2022	68 % of university students report weekly engagement with educational content.	Demonstrates Douyin's growing legitimacy as an informal learning tool.
Engagement with learning-related hashtags	Douyin Platform Data	2023	> 1.2 billion cumulative views across major study-related tags.	Highlights community-based, participatory learning behavior.
Accuracy issues in top educational videos	Chinese Academy of Education Sciences	2023	18 % of popular videos contained factual inaccuracies or lacked citation.	Reveals quality-control challenges and need for critical digital literacy.
Students using Douyin to clarify difficult course concepts	Tsinghua University Digital Learning Study	2023	56 % used Douyin post-class, mainly for English and STEM subjects.	Suggests Douyin serves as a compensatory learning aid for complex topics.

The data underline Douyin's transformation from a social-media platform into a large-scale participatory learning environment. Its algorithmic structure enables personalized content delivery, allowing students to select topics, control pacing, and revisit explanations as needed. For learners in under-resourced areas, this accessibility can supplement the limits of traditional teaching. Yet the same algorithms that tailor learning also restrict diversity. By optimizing engagement, they repeatedly feed users similar content, reducing exposure to unfamiliar ideas. Scholars such as Zhao and Liu (2023) describe this as *algorithmic tunnel vision*—a narrowing of cognitive range under personalized recommendation loops.

The participatory dimension further reinforces Douyin's role as an educational ecosystem. Students engage not only by watching videos but by producing and discussing them. Peer-learning communities built around academic hashtags provide encouragement and social accountability. These interactions turn the platform into a decentralized classroom shaped by collective motivation rather than institutional structure. Still, the absence of oversight introduces risks: popularity often replaces accuracy, and commercial motives can overshadow pedagogical intent.

Douyin thus represents both opportunity and tension. It democratizes access to knowledge but also fragments intellectual experience. It embodies China's broader experiment with algorithmic education, where the logic of data and attention increasingly shapes what and how students learn. Understanding this duality is essential for educators seeking to navigate the balance between technological inclusion and the preservation of educational integrity.

4. Rethinking Academic Performance

4.1 Limitations of Traditional Assessment Metrics

The rapid integration of platforms like Douyin into students' everyday learning has begun to challenge the long-standing dominance of examinations and GPA as the sole indicators of academic excellence. These traditional metrics were developed within a paradigm that assumed knowledge acquisition occurred primarily within classrooms and through linear, text-based study. In today's digital environment, however, significant portions of learning take place beyond these institutional boundaries—in short, interactive bursts of engagement that are difficult to quantify through conventional means.

For many university students, Douyin functions as a supplementary learning tool that fills the temporal and spatial gaps of formal education. Students frequently turn to the platform to review difficult topics, seek alternative explanations, or access practical study strategies. According to a 2023 survey by the *China Education Research Network*, nearly 61 percent of respondents reported that short educational videos helped them "understand course content faster than classroom lectures," and 48 percent said they used such videos to "clarify complex ideas" after formal lessons. Despite this evident learning impact, such activities are invisible to existing evaluation systems, which continue to privilege exam-based recall and essay-style performance.

The inadequacy of these systems becomes clearer when considering how digital learning reshapes the very nature of engagement. Students who excel in traditional assessments are not necessarily those who make the most productive use of digital resources, and vice versa. Many learners demonstrate creativity, problem-solving skills, or community contribution through their participation in online study groups or content creation on Douyin—forms of intellectual labor that remain unrecognized by standard grading. For example, a student who curates an educational channel that helps thousands of peers prepare for language proficiency exams contributes substantially to collective learning yet gains no formal academic credit.

Moreover, traditional grading mechanisms often fail to measure metacognitive abilities such as self-regulation, information literacy, and critical evaluation of digital content—all essential skills in navigating algorithm-driven knowledge systems. As microlearning becomes increasingly embedded in the learning habits of Chinese university students, assessment systems grounded purely in memorization or time-bound testing risk losing relevance. Education scholars such as Li and Zhang (2023) argue that "the exam-centered paradigm can no longer capture the spectrum of learning in a digitized society," calling for models that recognize engagement, reflection, and adaptive learning behaviors as integral aspects of academic performance.

Redefining excellence, therefore, requires acknowledging the plurality of learning pathways that now coexist. Universities must expand their conception of performance to include not only the mastery of prescribed content but also the capacity to learn independently, to connect ideas across digital and disciplinary boundaries, and to contribute to knowledge communities in meaningful ways. Without such reform, assessment will remain out of step with the realities of how learning actually occurs in the era of Douyin-driven microlearning.

4.2 Microlearning as a Motivational Catalyst but Cognitive Challenge

Douyin's microlearning format is remarkably

effective in stimulating students' curiosity and sustaining short-term motivation. The immediacy of short videos, their vivid imagery, and the instant sense of accomplishment associated with rapid content consumption create a psychological environment that feels rewarding. According to a 2023 *iMedia Research* survey, over 70 percent of Chinese university students described short-form educational videos as "more engaging" than traditional lectures, citing "clarity," "visual appeal," and "time efficiency" as the main reasons. The platform's algorithm reinforces this engagement through continuous feedback loops: when users like, comment, or share a video, similar content appears almost instantly, generating a feeling of personalized responsiveness that enhances motivation to keep learning.

This dynamic can, in certain respects, serve educational goals. For students who struggle with attention or lack external motivation, microlearning offers manageable entry points into complex subjects. The accessibility of a one-minute explainer video lowers the cognitive barrier to starting a task. Cognitive psychologists have long noted that small, achievable goals can increase persistence; Douyin's design unconsciously applies this principle. A student might watch three brief grammar lessons during a bus ride, an act that provides instant reinforcement without the cognitive fatigue of a full study session. For learners balancing academic pressures, internships, and social obligations, these microbursts of learning can accumulate into meaningful gains in exposure and familiarity.

Yet the same design features that boost motivation also present significant cognitive challenges. Douyin's rapid pace, continuous scrolling, and fragmented presentation encourage surface-level processing rather than deep comprehension. Studies from the *Tsinghua University Center for Learning Science* (2023) indicate that while 62 percent of students report that microlearning "helps recall key facts," only 28 percent feel it "improves critical understanding" of underlying principles. The constant switching of attention between topics can reduce the ability to retain information over longer periods—a phenomenon related to cognitive load theory, which warns that excessive information segmentation can hinder the integration of new knowledge into existing mental frameworks.

Furthermore, the emotional intensity of short videos—the use of music, humor, or quick visual transitions—can create a misleading sense of mastery. Learners often overestimate their understanding because the presentation feels fluent and satisfying. Educational researchers such as Chen and Qiu (2022) call this the "illusion of competence," a bias amplified by algorithmic repetition. When the same style of content is repeatedly shown, students gain familiarity with patterns but not necessarily with meaning. The result is a cycle of pseudo-learning, where engagement replaces comprehension.

Microlearning thus embodies a paradox. It democratizes access and stimulates motivation but at the potential cost of cognitive depth. In the long run, this imbalance may alter how students define learning success—valuing speed and recognition over accuracy and reasoning. To mitigate these effects, some educators are experimenting with guided microlearning frameworks, in which Douyin-style videos are integrated into structured courses with explicit reflection tasks or follow-up discussions. Such scaffolding reintroduces the missing element of deliberation and helps students move from passive consumption to active inquiry.

Douyin's ability to motivate students should not be dismissed; it represents a genuine pedagogical resource in a world of divided attention. But its motivational strength must be harnessed carefully, with deliberate strategies that transform the energy of engagement into sustained intellectual effort. Without such mediation, microlearning risks becoming a digital echo of fast food—immediately gratifying, widely consumed, and nutritionally thin.

4.3 New Competencies for the Digital Learner

In a learning environment increasingly mediated by algorithms, success depends on competencies that extend beyond memorization and test performance. University students today must navigate a complex information ecosystem—filtering sources, managing attention, and exercising critical judgment across multiple platforms. As microlearning through Douyin becomes embedded in everyday study routines, digital literacy, attention regulation, and self-directed learning have emerged as essential capacities that define academic readiness in the digital age.

Digital literacy now encompasses far more than the ability to operate devices or use search engines. It involves understanding how algorithms shape visibility, credibility, and bias in the information students consume. The *2023 China Internet Literacy and Education Report* found that only 42 percent of university students could accurately distinguish between sponsored and organic educational content on Douyin. This indicates a widespread lack of awareness about how platform design influences what appears to be "recommended knowledge." Without such literacy, learners risk mistaking algorithmic popularity for academic reliability. Developing digital discernment—knowing when and how to question, verify, and contextualize information—has therefore become a core academic skill.

The second key competency is the ability to regulate attention in environments engineered for distraction. Douyin's interface—fast transitions, autoplay features, and adaptive suggestions—is designed to maintain constant engagement. This environment strains cognitive endurance and erodes the capacity for sustained focus. A 2023 study by *Beijing Normal University's Institute of Psychology* found that students who spent more than two hours daily on short-video platforms exhibited a 14 percent lower average sustained attention span during reading tasks compared with peers who used such platforms less than 30 minutes per day. The finding underscores a growing educational challenge: how to help students maintain concentration while benefiting from the flexibility of digital learning. Programs that incorporate mindfulness exercises, structured screen breaks, or "focused study windows" are beginning to appear in some Chinese universities as counterbalances to the attentional fragmentation induced by constant media use.

Equally important is the cultivation of self-directed learning. In the Douyin ecosystem, where learning opportunities emerge spontaneously and informally, the student's ability to set goals, plan sequences, and evaluate progress determines whether microlearning becomes transformative or superficial. Self-directed learners use Douyin strategically: they bookmark videos for review, cross-reference explanations, and apply learned content to real academic tasks. However, many others drift through algorithmic suggestions without intentionality, accumulating fragments of knowledge without integration. A 2022 *Nanjing University Learning Behavior Survey* revealed that 57 percent of students who used Douyin for study "rarely followed up on what they watched," while only 21 percent reported summarizing or applying the content afterward. This gap illustrates the difference between exposure to information and genuine learning—an issue that cannot be resolved by technology alone but requires the deliberate teaching of metacognitive strategies.

Developing these new competencies is not an auxiliary goal but a central educational task. As digital environments continue to redefine the conditions of learning, universities must prepare students to act as critical participants rather than passive recipients within algorithmic systems. Integrating courses on media literacy, information ethics, and self-regulation into general education curricula could help students build the reflective awareness needed to learn responsibly. In a sense, mastering Douyin as a learning space means mastering oneself within it—the ability to engage with the platform's speed and abundance while preserving focus, discernment, and intellectual autonomy.

4.4 Toward a Broader Definition of Performance

The evolving ecology of digital learning invites a fundamental rethinking of what constitutes academic performance. In an age where knowledge is fragmented across media, disciplines, and formats, achievement can no longer be confined to the reproduction of facts or the mastery of a fixed syllabus. The capacity to synthesize dispersed information, evaluate its reliability, and integrate it into coherent understanding is becoming the new mark of scholarly competence. Within China's universities, where Douyin and similar platforms increasingly shape learning habits, this redefinition is not only timely but necessary.

Microlearning has restructured how students interact with information. Learning now occurs in fragments—fifty-second explanations, one-minute tutorials, and condensed conceptual summaries. While these snippets lack the depth of extended study, they offer raw material for synthesis. A student's academic strength, therefore, lies not in the volume of content consumed but in the ability to connect these fragments meaningfully. The *2023 National Center for Educational Technology Report* notes that students who regularly organize or

recontextualize microlearning materials—such as creating notes, summaries, or personal study playlists—show a 20 percent higher retention rate compared with those who passively consume videos. This suggests that the future measure of performance may rest less on rote recall and more on integrative competence—the ability to transform fragmented exposure into sustained understanding.

Critical reflection forms the second pillar of this broader conception. The abundance of information available through Douyin requires constant discernment between credible insight and superficial commentary. Academic success, therefore, must include the skill of questioning authority, identifying bias, and articulating informed judgments about digital content. Chinese universities are beginning to address this challenge by embedding media critique and information ethics into undergraduate education. For instance, Renmin University's 2023 "Digital Thinking and Academic Integrity" module explicitly trains students to evaluate algorithmic influence on what they read, watch, and learn online. Such initiatives recognize that literacy in the digital age is as much about ethical reasoning as it is about technical skill.

Equally vital is the ability to maintain attention and intellectual composure amid continuous media stimulation. Students today study in environments saturated with notifications, hyperlinks, and algorithmic prompts that fracture concentration. Sustained focus becomes an achievement in itself—a prerequisite for deep learning rather than a by-product of it. Educational psychologists now regard attention management as an academic competency, similar in weight to reading or writing proficiency. Incorporating reflective practices—such as digital journaling, note synthesis, or brief offline study periods—can help students develop the discipline to think slowly within a fast medium.

Finally, a redefined notion of performance must reconcile microlearning's immediacy with academic integrity's deliberation. The speed of digital consumption risks undermining the ethical and intellectual honesty that education traditionally upholds. When learning occurs through socially shared and often unverified content, maintaining originality and proper attribution becomes complex yet essential. Universities, therefore, must extend integrity policies to include online microlearning practices, guiding students on responsible citation, content verification, and ethical sharing.

Taken together, these developments point toward a broader and more nuanced understanding of academic performance—one that values synthesis over accumulation, reflection over repetition, and intentional focus over passive exposure. In this emerging framework, success is measured not by how much information a student encounters, but by how deeply that information is processed, connected, and ethically applied. Such a conception bridges the gap between Douyin-based microlearning and the enduring ideals of scholarship, reaffirming that in the digital age, true academic excellence remains rooted in thoughtful engagement and moral purpose.

5. Institutional and Pedagogical Adaptation

5.1 Integrating Microlearning into Formal Curriculum Design

Chinese universities are gradually experimenting with the integration of microlearning into their formal curricula, recognizing that the short-video model, when intentionally designed, can serve pedagogical rather than purely recreational purposes. The shift toward blended and flipped learning has opened a pathway for platforms such as Douyin to be reimagined as teaching tools rather than distractions. In flipped classrooms, for example, short instructional videos—concise explanations of theoretical concepts, step-by-step demonstrations, or pre-class prompts—allow students to engage with content before entering the physical or virtual classroom. This approach gives instructors more time for discussion, problem-solving, and reflective activities during class sessions.

A growing number of institutions are formalizing such practices. In 2023, Shanghai Jiao Tong University introduced a pilot program in its School of Foreign Languages that integrated Douyin-style micro-lectures into English for Academic Purposes (EAP) courses. Each week, students viewed one to two short videos explaining rhetorical structures or vocabulary strategies before class. According to internal course reports, student preparation rates increased by nearly 40 percent, and participation during in-class discussions rose significantly. Similarly, Guangzhou University's Faculty of Education launched a "Smart

Learning Hub" initiative that encouraged instructors to produce one-minute teaching clips aligned with key curriculum outcomes. These microvideos were hosted on a university-managed Douyin channel and used as supplemental study material. Course evaluations showed a measurable rise in learner satisfaction and self-reported comprehension, particularly among first-year students adapting to university-level study.

These examples demonstrate how microlearning can enhance accessibility and engagement when supported by pedagogical scaffolding. The brevity of Douyin-style content aligns well with students' digital habits, allowing for continuous, flexible review beyond classroom time. Yet successful integration depends on design quality rather than platform popularity. Effective microlearning modules follow coherent instructional principles: they define clear learning objectives, link short videos into structured sequences, and encourage application through follow-up assignments or quizzes. When these elements are present, microlearning becomes part of a continuum of learning rather than an isolated distraction.

The benefits are particularly evident for students from diverse learning backgrounds. Short-form content lowers the threshold for engagement, especially for those who struggle with reading-intensive materials or abstract lectures. Data from a 2022 *China Higher Education Teaching Reform Survey* showed that 72 percent of students who engaged with short educational videos as pre-class resources reported "greater confidence" in understanding course material. The flexibility of such media accommodates learners who may be balancing study with work or family obligations, aligning with national goals to promote equitable access to higher education.

However, the process of embedding microlearning into formal education also raises structural questions. Universities must consider ownership, quality control, and sustainability. Should instructors rely on open Douyin content created by external educators, or should institutions develop proprietary repositories of short academic videos? How can academic rigor and verification be maintained in a format driven by entertainment logic? These questions point to the need for institutional frameworks that combine creative freedom with academic governance.

In the best cases, integrating Douyin-style microlearning into curriculum design does not replace traditional teaching but reconfigures its rhythm. Knowledge delivery becomes more flexible, and class time transforms into a site of application and dialogue. When students arrive already acquainted with core ideas through micro-videos, classroom learning deepens rather than accelerates. Under these conditions, Douyin becomes not a distraction from study but a bridge between formal instruction and the dynamic, self-directed learning culture that defines China's new digital generation.

5.2 Balancing Educational Value and Entertainment Appeal

The greatest strength of Douyin as a learning medium—its visual immediacy and entertainment-driven design—is also its greatest pedagogical risk. Educators attempting to adapt short-video formats for academic purposes must navigate a delicate balance between engagement and rigor. The same design elements that attract students—rapid transitions, music overlays, humor, and personalization—can easily dilute content depth and turn learning into a performance of attention rather than understanding.

Chinese universities exploring microlearning integration have repeatedly confronted this tension. Many instructors report that while students respond enthusiastically to Douyin-style lessons, their comprehension sometimes remains shallow. A 2023 *Beijing Normal University School of Education* survey found that 58 percent of teachers using short-form videos in class preparation "noticed increased enthusiasm but limited improvement in analytical thinking." The challenge arises from the entertainment logic embedded in the medium itself: content optimized for views and likes often prioritizes clarity and novelty over complexity. In contrast, true academic learning requires grappling with ambiguity, depth, and sustained inquiry—qualities that do not always lend themselves to the compressed tempo of social media.

Maintaining educational value, therefore, demands intentional design. Short videos used in teaching should not replicate entertainment aesthetics uncritically; rather, they must translate academic rigor into accessible formats. Pedagogical coherence can be achieved through sequencing—linking short clips into thematic

clusters that build progressively toward conceptual mastery. For instance, an instructor teaching Chinese literature might create a micro-series introducing one motif per clip, with the final segment prompting comparative analysis. The short-video structure becomes not an end in itself but a scaffold for deeper exploration.

Another key strategy involves encouraging active learner engagement. Instead of passively consuming educational videos, students can be tasked with responding to, annotating, or remixing them. At East China Normal University, a 2022 pilot course in digital pedagogy asked students to produce one-minute Douyin reflections summarizing weekly readings. The exercise required synthesis, conciseness, and creative expression, transforming the platform's entertainment logic into an intellectual one. Course assessments showed that students who participated in these microproduction tasks demonstrated notably higher recall scores and stronger motivation to connect theoretical ideas with real-world issues.

However, the temptation to pursue popularity metrics remains strong. Instructors who upload educational content to public Douyin accounts often find that videos framed with humor or emotional hooks receive exponentially more engagement than those emphasizing academic substance. This discrepancy risks incentivizing style over substance, reinforcing the "attention economy" at the expense of critical thought. To counter this, universities are beginning to establish internal platforms modeled on Douyin but designed for educational use, such as Tsinghua's MicroClass Hub and Zhejiang University's ZhiXue Cloud, where engagement is measured by completion and comprehension rather than clicks or likes. These institutional adaptations seek to reclaim the aesthetic appeal of short video while aligning it with learning outcomes.

Ultimately, the success of Douyin-based pedagogy depends not on replicating entertainment but on transforming it. When educators use the visual and narrative techniques of the platform to clarify difficult concepts, foster emotional resonance, or stimulate dialogue, microlearning gains pedagogical integrity. The key lies in maintaining intellectual coherence beneath visual appeal—ensuring that each second of attention contributes to understanding, not merely to stimulation. In this sense, balancing education and entertainment is less about restriction and more about refinement: shaping an art of teaching that captivates without compromising the discipline of thought.

5.3 Professional Development for Digital Pedagogues

The success of Douyin-based microlearning in higher education ultimately depends on the educator's ability to navigate the intersection between pedagogy, media, and technology. As universities begin to adopt short-video teaching strategies, it becomes clear that most instructors—trained in traditional lecture-based methods—lack the media literacy required to design educational content that is both engaging and academically rigorous. Professional development has therefore become a cornerstone of this new digital pedagogy.

In the past few years, several Chinese universities have established teacher training programs aimed at cultivating what education scholars call "multimodal pedagogical competence." These initiatives emphasize three interrelated domains: storytelling, ethical awareness, and media design literacy. Storytelling enables teachers to convey abstract ideas through compelling narrative structures suited to short-form media. Ethical awareness addresses the responsibilities associated with creating public-facing educational content, including citation standards, data privacy, and respect for intellectual property. Media design literacy equips educators with practical knowledge of video editing, visual composition, and platform algorithms so they can make informed creative choices.

One notable initiative is the Digital Pedagogy Innovation Program launched by the *Ministry of Education's National Center for Teacher Development* in 2022. The program trained over 10,000 university instructors in short-video production and instructional design using Douyin and Bilibili as case studies. Participants were guided to create three-minute "micro-lectures" that distilled complex topics into concise, pedagogically coherent narratives. Evaluations showed a 35 percent increase in teachers' confidence in using digital tools and a measurable improvement in students' reported engagement during pilot courses. The project highlighted the potential of targeted training to shift educators' roles from content transmitters to curators of learning

experience—professionals capable of integrating creativity and critical awareness into digital teaching.

At a more local level, universities such as Beijing Foreign Studies University and South China Normal University have developed internal workshops combining theoretical instruction with production labs. Faculty members learn to script educational narratives, design visuals that support cognitive retention, and align microlearning content with curriculum standards. Instructors also discuss case studies of ethical dilemmas—such as the use of copyrighted materials, student data privacy, and the risk of misinformation spread through algorithmic amplification. These sessions encourage reflective practice, positioning the educator not as an influencer chasing engagement metrics but as a guide who shapes meaningful learning experiences within the constraints of attention-driven media.

The shift toward digital pedagogy also redefines academic professionalism. Instructors are expected to model responsible media citizenship, demonstrating how intellectual rigor and creativity can coexist online. This transformation requires institutional support—time for experimentation, recognition for digital teaching innovation, and updated evaluation systems that reward pedagogical creativity alongside research output. Without such structural backing, even the most motivated educators risk burnout or superficial engagement with digital methods.

The emergence of Douyin as a learning platform thus challenges universities to reimagine what it means to teach in the 21st century. Teachers must become storytellers who animate concepts, designers who understand visual rhetoric, and ethicists who uphold credibility in an environment saturated with spectacle. When properly supported, they can turn microlearning into a bridge between academic integrity and the expressive potential of digital culture—guiding students not only in what to learn but in how to learn responsibly amid the constant flow of information.

6. Ethical and Cultural Tensions

Douyin's integration into educational practice has brought not only new pedagogical opportunities but also profound ethical and cultural dilemmas. The platform operates within what scholars call the attention economy—a system where human focus becomes a tradable commodity. Every second of student engagement is measured, monetized, and optimized through algorithms designed to maximize screen time. While this model supports personalization and accessibility, it simultaneously raises questions about autonomy, manipulation, and the commercialization of education.

At the ethical level, the most immediate concern is data privacy. Douyin's recommendation system relies on vast amounts of behavioral data—what users watch, for how long, when they pause, and what they like or skip. These data points are used to construct individualized learning environments, yet the boundaries between pedagogical personalization and commercial profiling remain blurred. According to a 2023 *China Internet Information Center* policy brief, over 62 percent of Chinese university students expressed uncertainty about how their learning data on short-video platforms were collected or used. Such ambiguity undermines trust, especially when educational engagement is analyzed using the same metrics as advertising performance. Universities adopting these tools face a difficult balance between innovation and student protection, as they must ensure that algorithmic optimization does not come at the cost of learner privacy.

Closely linked to privacy is the issue of algorithmic manipulation. Algorithms shape what knowledge students encounter, effectively acting as invisible gatekeepers of learning. By privileging engagement metrics—likes, shares, and viewing duration—Douyin's system promotes content that entertains more than it educates. The subtle shift from curiosity-driven exploration to algorithm-driven exposure risks reducing learning to a behavioral reflex. A 2022 *Communication University of China* study found that when educational creators adjusted their videos for algorithmic visibility—shortening explanations, adding music, or simplifying visuals—viewership increased by 44 percent, but audience recall of key concepts dropped significantly. This trade-off between reach and comprehension reflects a deeper ethical tension: should education adapt to platform logic, or should platforms adapt to educational values?

Beyond the ethical dimension lies a broader cultural conflict between speed-oriented digital learning and the traditional Chinese ethos of perseverance and self-cultivation. For centuries,

education in China has been inseparable from moral development—a process guided by restraint, patience, and reflection. The Confucian notion of *xiū shēn qí jiā zhì guó píng tiān xià* ("cultivate the self, regulate the family, govern the state, bring peace to the world") reflects the belief that learning is a moral journey requiring self-discipline and long-term effort. Douyin's instant gratification model, by contrast, prizes immediacy, novelty, and consumption. Its algorithm rewards speed and responsiveness, creating a rhythm of learning that privileges momentary satisfaction over sustained understanding.

This cultural tension has not gone unnoticed. Commentaries in *China Education Daily* and *The Paper* have argued that the rise of short-video learning signals "a weakening of reflective learning habits among youth." Educators report that students increasingly seek "quick answers" rather than comprehensive understanding, mirroring the behavior patterns of algorithmic consumption. In Confucian terms, this shift represents a challenge to the virtue of *jing* (精)—the meticulous refinement of skill and understanding through repeated practice. Instead, the dominant digital virtue becomes *su* (速)—speed, convenience, and instant visibility.

Nevertheless, the dichotomy between traditional moral learning and digital efficiency need not be absolute. Some educators advocate for what they call "reflective microlearning"—the deliberate use of Douyin's short-form format to introduce moments of contemplation rather than distraction. For example, a philosophy instructor at Fudan University has created a Douyin series where each 60-second video ends with an open-ended question rather than a conclusion, prompting viewers to pause and reflect before scrolling further. This practice reclaims the platform's brevity as a pedagogical device for cultivating mindfulness and moral curiosity within a fast-paced medium.

The ethical and cultural tensions surrounding Douyin thus extend beyond technical regulation or classroom policy; they reach into the very philosophy of learning in contemporary China. The challenge is to reconcile *ren* (仁)—the humanistic essence of Confucian education—with the algorithmic efficiency of digital pedagogy. Achieving this balance requires educators, policymakers, and technology developers to work collaboratively in defining an ethical framework that safeguards integrity while embracing innovation. In doing so, China's digital education can evolve not as a rejection of tradition, but as its reinterpretation for the age of algorithms—where virtue and efficiency coexist in creative tension.

7. Policy and the Future of Digital Education

China's *Education Digitalization Strategy 2035*, released by the Ministry of Education, outlines an ambitious blueprint for transforming the nation's educational landscape through technology. Its guiding principle—"digital empowerment with equity and quality"—emphasizes not only access but also the ethical and pedagogical integrity of digital learning environments. Within this framework, platforms such as Douyin have become subjects of both interest and scrutiny. Policymakers recognize their potential to democratize learning opportunities, particularly for students in under-resourced regions, yet remain cautious about the pedagogical and ethical implications of algorithmic governance.

The state's endorsement of educational digitalization has accelerated the adoption of microlearning across China's universities. Initiatives like the *Smart Education of China* platform, launched in 2021, already provide more than 6 million digital learning resources and have reached tens of millions of users nationwide. By comparison, Douyin's massive user base represents an untapped educational network whose infrastructure could complement official systems. The challenge, however, lies in ensuring that this integration does not compromise academic standards or lead to the commodification of learning. Policymakers are therefore exploring mechanisms to align commercial platforms with national educational goals through partnership frameworks and regulatory oversight.

In 2023, the Ministry of Education began pilot collaborations with several technology firms to test the pedagogical use of short-video platforms in secondary and tertiary education. These partnerships include content verification mechanisms, copyright protections, and ethical review procedures designed to ensure that educational materials distributed through Douyin adhere to state standards. At the same time, the *Guidelines for Building a Credible Online Education Ecosystem* issued in 2022 emphasize transparency in algorithmic decision-making and the need for platforms to provide users with

clearer control over recommendation systems. The underlying aim is to develop a trust-based digital learning ecosystem that prioritizes knowledge accuracy and learner well-being over engagement metrics.

Regional equity remains another critical policy concern. Rural and less developed provinces continue to face disparities in educational resources, infrastructure, and teacher availability. Douyin's widespread accessibility through mobile devices presents an opportunity to narrow these gaps. A 2022 *China Education and Research Network (CERNET)* report showed that over 78 percent of rural students access learning materials primarily through smartphones. When used responsibly, microlearning can thus serve as a bridge to national education goals—offering concise, low-bandwidth content that reaches learners beyond the limitations of geography. To support this, provincial education departments are encouraging the production of localized microlearning materials in dialects or regional contexts, ensuring inclusivity within digital education.

Yet the success of these efforts will depend on ethical algorithmic governance. If left unchecked, algorithms that prioritize attention and profitability may reinforce bias, misinformation, or the marginalization of niche academic subjects. Policymakers are therefore advancing discussions on algorithm transparency and data accountability. The *Cyberspace Administration of China's Provisions on Algorithmic Recommendation Management* (2022) requires platforms to "uphold socialist core values" and prevent algorithmic exploitation in educational and cultural domains. While this regulation is primarily protective, it also opens a path for pedagogical alignment—encouraging algorithms to prioritize verified educational content, promote interdisciplinary exposure, and flag misleading material.

The future of China's digital education will likely be shaped by a hybrid governance model—a collaboration between state oversight, institutional innovation, and technological responsibility. Universities will continue to act as testing grounds for ethical and effective uses of platforms like Douyin, while national policy ensures coherence and accountability. In this emerging framework, technology serves education rather than dominating it; algorithms become partners in pedagogy rather than arbiters of knowledge.

If the *Education Digitalization Strategy 2035* succeeds in harmonizing innovation with integrity, China could become a global reference for how traditional educational values adapt within algorithmic modernity. Douyin's trajectory—from entertainment platform to informal classroom—symbolizes this transition. The challenge ahead lies not in rejecting digital tools but in shaping them ethically, so that the promise of accessibility is matched by a commitment to authenticity, inclusivity, and human-centered learning.

8. Concluding Reflection

Douyin has become a mirror of the contradictions shaping education in the digital age. It democratizes access to knowledge on a scale unimaginable a decade ago, yet it also fragments attention, compresses thought, and redefines what it means to learn. For Chinese higher education, the question is not whether such platforms belong in the academic world, but how they can be guided to serve educational rather than commercial ends. Rejecting short-video learning outright would be neither practical nor pedagogically wise; the task is to humanize technology—to design learning systems where speed, convenience, and connectivity are balanced by reflection, empathy, and intellectual discipline.

Across this study, Douyin has emerged as a symbol of China's ongoing negotiation between tradition and transformation. On one side stand centuries of educational philosophy grounded in Confucian endurance, moral cultivation, and deep reading. On the other lies the algorithmic culture of immediacy—learning in seconds, feedback in milliseconds. The tension between these poles does not necessarily spell decline; rather, it offers an opportunity to redefine what "depth" means in an age of information abundance. Depth may no longer reside only in time spent or pages read but in the quality of attention and the capacity to discern meaning within fragments.

The evidence from recent initiatives across Chinese universities shows that short-video microlearning, when structured thoughtfully, can complement formal education. Blended and flipped classrooms that incorporate Douyin-style modules demonstrate higher engagement and broader accessibility, particularly for students from diverse learning backgrounds. At the same time, these

experiments confirm that design and ethics—not technology alone—determine educational value. Microlearning achieves its promise only when educators act as curators of experience, ensuring coherence amid distraction and guiding students to connect scattered insights into reflective understanding.

Looking forward, the future of digital education in China depends on sustaining this balance. Policymakers, teachers, and students share a collective responsibility to cultivate a learning culture that values depth within brevity—where rapid communication coexists with deliberation, and technological efficiency enhances rather than erodes moral purpose. The true measure of progress will not be how quickly information travels but how deeply it transforms those who engage with it.

In this sense, Douyin's significance extends beyond technology. It represents a new cultural experiment: whether a civilization built upon patience, scholarship, and virtue can reinvent these ideals in an era defined by acceleration. If Chinese higher education succeeds in this transformation—integrating innovation without surrendering integrity—it may not only adapt to the digital world but also humanize it, reaffirming that even in an age of instant knowledge, learning remains a profoundly moral and reflective act.

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