USING THE THEORY OF MULTIPLE INTELLIGENCES TO GUIDE THE DESIGN OF ELEMENTARY SCHOOL ENGLISH HOMEWORK

WANG YIYU

A THESIS SUBMITTED IN PARTIAL FULLFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF EDUCATION PROGRAM IN LEARNING TECHNOLOGY AND INNOVATION FACULTY OF TECHNICAL EDUCATION RAJAMANGALA UNIVERSITY OF TECHNOLOGY THANYABURI ACADEMIC YEAR 2023

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Thesis Title	Using the Theory of Multiple Intelligences to Guide the Design of Elementary School English Homework
Name Surname	Mr. Wang Yiyu
Program	Learning Technology and Innovation
Thesis Advisor	Assistant Professor Tiamyod Pasawano, Ed.D.
Academic Year	2023

THESIS COMMITTEE

..... Chairman
(Assistant Professor Metee Pigultong, Ph.D.)

..... Committee
(Associate Professor Nattaphon Rampai, Ed.D.)

..... Committee
(Assistant Professor Naruemon Thepnuan, Ph.D.)

..... Committee
(Assistant Professor Tiamyod Pasawano, Ed.D.)

Approved by the Faculty of Technical Education, Rajamangala University of Technology Thanyaburi in Partial Fulfillment of the Requirements for the Master's Degree

..... Dean of the Faculty of Technical Education
(Assistant Professor Arnon Niyomphol, M.S.Tech.Ed.)

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ABSTRACT

The objectives of this study were to: 1) investigate how to design elementary school English homework guided by the theory of multiple intelligences to stimulate students' enthusiasm for English learning, promote personalized development and improve academic performance, 2) compare students' learning achievements before and after the implementation in order to determine its significance level and 3) examine students' satisfaction with English homework design guided by the theory of multiple intelligences.

The research samples consisted of 54 fourth-grade students from Class 5 of Chongqing Eighth Primary School, Yuzhong district, Chongqing province, China, in the 2021-2022 academic year, selected through purposive sampling. Research tools included elementary school English homework designed under the guidance of the theory of multiple intelligences, assessments of the quality and technical aspects of English homework content, achievement questionnaires and satisfaction questionnaires.

The research results indicated that: 1) The effectiveness of designing elementary school English homework guided by the theory of multiple intelligences for individual differences in English language proficiency showed verifiable efficiency. Experts' evaluations of the content of English homework design guided by the theory of multiple intelligences and the evaluation of media both met the criteria of excellence ($\bar{x}$=4.87, *SD* =0.23 and $\bar{x}$=4.40, *SD* = 0.52, respectively). 2) Post-test scores were significantly higher than pre-test scores at the statistical significance level of .05. 3) Students exhibited the highest satisfaction with elementary school English homework design guided by the theory of multiple intelligences ($\bar{x}$= 4.53, *SD* =0.50).

Keywords: multiple intelligences, english homework, guidance of theory

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Wang Yiyu

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CHAPTER 1
INTRODUCTION

1.1 Background and Statement

The Theory of Multiple Intelligences, proposed by American psychologist Howard Gardner in 1983, challenges the traditional notion of intelligence, suggesting that intelligence is not a singular, universal ability but is composed of multiple intelligences. Gardner initially identified seven types of intelligences, later expanding the list to nine. Here's a detailed overview of these nine types of intelligences 1) Linguistic Intelligence: This involves understanding, using, and creating language. Individuals with high linguistic intelligence excel in expressing ideas, writing, reading comprehension, and verbal communication. Professions like writers, orators, and lawyers often demonstrate strength in linguistic intelligence 2) Logical-Mathematical Intelligence: This type involves mathematical and logical reasoning skills. People with high logical-mathematical intelligence are adept at analyzing problems, reasoning, and solving mathematical puzzles. Scientists, engineers, and mathematicians often excel in this area.3) Spatial Intelligence: This encompasses understanding space and forms. Those with high spatial intelligence excel in comprehending visuals, charts, and spatial orientation. Artists, designers, and architects typically display strength in spatial intelligence.4) Musical Intelligence: Musical intelligence involves sensitivity to and understanding of music. Individuals with high musical intelligence can identify tones, rhythms, and engage in music composition and performance. Musicians, composers, and music educators often excel in this domain.5) Bodily-Kinesthetic Intelligence: This type involves using body movements. Those with high bodily-kinesthetic intelligence excel in sports, dance, and crafts. Athletes, dancers, and artisans typically demonstrate strength in bodily-kinesthetic intelligence.6) Interpersonal Intelligence: Interpersonal intelligence involves understanding others' emotions, motivations, and excelling in social interactions. Individuals with high interpersonal intelligence are skilled at cooperation, leadership, and conflict resolution. Teachers, psychologists, and salespersons often excel in this area. 7) Intrapersonal Intelligence: This type involves self-awareness of one's feelings, emotions, and goals. Individuals with high intrapersonal intelligence are skilled in self-reflection,

self-management, and goal-setting. Psychologists, counselors, and self-help experts often excel in this domain.8) Naturalistic Intelligence: This involves sensitivity to nature and living things. People with high naturalistic intelligence are adept at observing, categorizing, and understanding natural phenomena. Ecologists, botanists, and zoologists often excel in this area.9) Existential Intelligence: This type involves contemplating philosophy and the meaning of life. Those with high existential intelligence focus on cosmic existence, the meaning of life, and the value of human existence. Philosophers and thinkers often demonstrate strength in this domain.

The Theory of Multiple Intelligences emphasizes that each individual possesses unique strengths and potential across different intelligence types. Educators can leverage this theory by employing diverse teaching methods and assessment approaches that cater to students' learning needs, promoting holistic development and potential exploration. This theory provides a comprehensive and personalized perspective on education, enabling educators to better address individual differences, ignite students' learning interests and potentials, thereby enhancing the quality and effectiveness of education. By understanding the nine types of intelligence, educators can better comprehend students' interests, strengths, and learning styles. This understanding can inform the use of more diversified and personalized teaching methods, offering more engaging learning experiences. For example, students displaying strong musical intelligence can be encouraged to participate in music-related activities to further nurture their musical talents. Similarly, students excelling in naturalistic intelligence can be recommended to engage in studies and practices related to ecology and environmental science.

Simultaneously, the application of the Theory of Multiple Intelligences fosters a positive learning environment that respects and understands students. Educators can create opportunities for students to showcase themselves by understanding their diverse intelligence traits, fostering confidence and satisfaction in learning. This theory introduces a fresh perspective to the field of education, driving a shift in educational models, making them more individualized, comprehensive, and development-oriented. The continuous development and application of this theory will continue to play a crucial role in stimulating students' interests and potentials, ultimately enhancing the quality of education.

The Theory of Multiple Intelligences has a close relationship with the design of elementary school English assignments. This is because the theory underscores the uniqueness of each student's intelligence traits, aligning with the need for personalized and diversified design in elementary school English assignments. The following points illustrate the connection between the Theory of Multiple Intelligences and the design of elementary school English assignments: 1) Personalized Assignment Design: The theory acknowledges that every student possesses distinct intelligence traits, possibly excelling in linguistic, musical, spatial intelligence, among others. In designing elementary school English assignments, educators can tailor tasks based on students' multiple intelligences, allowing each student to shine and develop in their strong intelligence domains. 2) Diverse Assignment Formats: As per the theory, students' learning styles and preferences vary widely. While one assignment format might suit certain students, it might not be effective for others. Therefore, assignment design should encompass various formats such as written, oral, visual, and audio assignments to cater to diverse learning needs and intelligence traits.3) Interdisciplinary Assignments: The theory encourages the fusion of different intelligence domains. Elementary school English assignments can be linked with other subjects, aiding students in integrating English learning with knowledge from other subjects and promoting interdisciplinary learning. 4) Collaborative Learning Assignments: Interpersonal intelligence is crucial in learning. Elementary school English assignment design can encourage students to collaborate in groups to complete tasks, fostering teamwork and interpersonal skills. 5) Utilizing Multimedia Technology: According to the theory, visual and auditory stimuli are vital for learning. In designing assignments, educators can leverage multimedia resources such as images, audio, and videos to increase student interest and engagement. 6) Creativity and Innovation: The theory encourages students to harness creativity and innovation across different intelligence domains. English assignment design can include creative tasks where students express their English learning through music, artwork, and crafts, sparking their creativity and imagination. 7) Emotional Connection: The theory asserts that emotions are closely tied to learning. In English assignment design, educators can introduce topics of interest to students, enabling them to experience joy and a sense of accomplishment, thereby enhancing positive emotional connections with English learning. 8) Real-Life

Relevance: The theory promotes the integration of learning with real-life contexts. In designing elementary school English assignments, educators can create tasks related to students' lives, like writing travel diaries or planning weekend activities, enabling practical application of English skills in real scenarios. 9) Multimedia Application: The theory underscores diverse learning resources. In designing English assignments, educators can introduce multimedia resources, such as recording spoken videos or watching English animations, to cater to students' visual, auditory, and kinesthetic intelligences. 10) Independent Learning: The theory encourages student autonomy. In designing English assignments, educators can motivate students to choose topics or activities of interest, allowing them to personalize their learning based on their needs and goals. 11) Learning Strategies: The theory acknowledges the diversity of learning strategies. In English assignment design, educators can guide students to explore learning methods and strategies that suit them best, enhancing learning efficiency.

Taking all these factors into consideration, the Theory of Multiple Intelligences offers a more diverse and personalized approach to designing elementary school English assignments. Educators can cleverly apply these principles to enable students to achieve comprehensive development in their English learning, while also discovering and cultivating their potential across different intelligence domains. This comprehensive instructional design not only stimulates students' interest in learning and enhances their motivation but also nurtures their self-confidence and learning abilities, ultimately effectively promoting the quality and outcomes of English education. The theory of Multiple Intelligences brings an innovative perspective to elementary school English assignment design, providing educators with a wealth of teaching options. By flexibly implementing these principles, educators can foster students' well-rounded development, ignite their passion for learning, boost their motivation, and ultimately elevate the quality and effectiveness of English education. This holistic teaching approach will play a positive role in students' growth journey.

1.2 Research of Objectives

2.1.1 To investigate how to design elementary school English homework guided by the theory of multiple intelligences to stimulate students' enthusiasm for English learning, promote personalized development, and improve academic performance.

2.1.2 To compare students' learning achievements before and after the implementation of homework design under the guidance of the theory of multiple intelligences.

2.1.3 To examine students' satisfaction with English homework design guided by the theory of multiple intelligences.

1.3 Research Hypothesis

There are three research hypotheses as to the following:

1.3.1 Students engaged in English assignment designs guided by the Theory of Multiple Intelligences will demonstrate higher levels of learning motivation and interest.

1.3.2 English assignment designs guided by the Theory of Multiple Intelligences will enhance students' self-directed learning abilities and innovative thinking.

1.3.3 English assignment designs guided by the Theory of Multiple Intelligences will strengthen students' collaborative and communicative abilities.

1.3.4 English assignment designs guided by the Theory of Multiple Intelligences will positively impact students' learning performance and outcomes.

1.4 Conceptual Framework

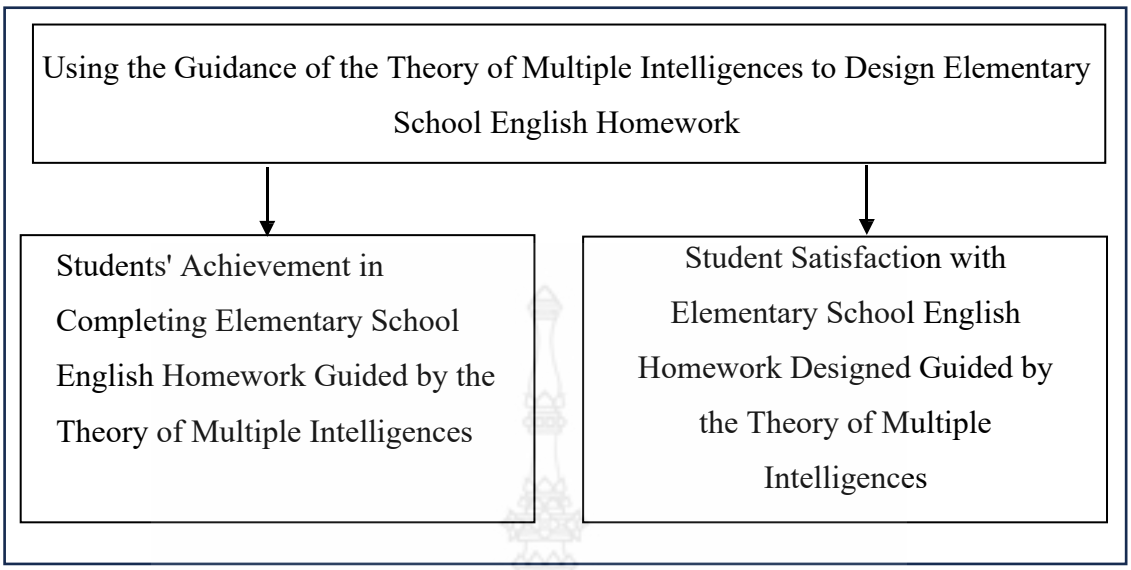

Figure 1.1 Conceptual Framework of the Effects of Designing Elementary School English Homework with Guidance from the Theory of Multiple Intelligences

1.5 Research of Methodology

The research methods used in this paper include literature analysis, observation, interview and field research. Mainly based on article analysis and practical teaching experience, this paper explores the value and significance of the application of artificial intelligence for individual difference in English language.

1.5.1 The population: The study population comprises fourth-grade students from Chongqing Eighth Elementary School during the 2020-2021 academic year. A purposive sampling method was utilized to select a sample of 54 students from Class Five of the fourth grade in the 2020-2021 academic year.

1.5.2 The research instruments consisted of 1) a targeted design and application of elementary school English assignments, addressing issues identified in the current state of elementary school English homework design in terms of assignment content, types, presentation methods, and assessment methods, 2) a questionnaire regarding the application of artificial intelligence to enhance learning outcomes based on individual differences in English learning among elementary school students, 3) pre-test and post-test performance questionnaires for students completing elementary school English

assignments guided by the Theory of Multiple Intelligences and 4) A satisfaction survey questionnaire for students' perceptions of the elementary school English assignments guided by the Theory of Multiple Intelligences, evaluating their learning outcomes.

1.5.3 The data were analyzed using, Mean, Standard Deviation, and t-test.

1.5.4 Variables:

15.4.1 Independent variable: Elementary school English assignments guided by the Theory of Multiple Intelligence

15.4.2 Dependent Variable are 1) students' learning performance after completing elementary school English assignments guided by the Theory of Multiple Intelligences 2) students' satisfaction with completing elementary school English assignments guided by the Theory of Multiple Intelligences.

1.5.5 Content

The Theory of Multiple Intelligences guides the diversified nature of elementary school English classroom teaching and post-class exercises. Aligned with this theory, the assignment design is targeted and implemented across four aspects: assignment content, types, presentation methods, and assessment methods. For instance, regarding assignment type design, assignments should be varied and innovative, inspiring students' interest through different formats to foster their enthusiasm for completing assignments. The design should incorporate diverse curriculum resources and integrate multiple intelligences, utilizing student-preferred formats such as cooperative performances and practical investigations to encourage student participation and choice, promoting well-rounded development of multiple intelligences.

1.5.6 Data amassment: the Theory of Multiple Intelligences guides the diversified nature of elementary school English classroom teaching and post-class exercises. Aligned with this theory, the assignment design is targeted and implemented across four aspects: assignment content, types, presentation methods, and assessment methods. For instance, regarding assignment type design, assignments should be varied and innovative, inspiring students' interest through different formats to foster their enthusiasm for completing assignments. The design should incorporate diverse curriculum resources and integrate multiple intelligences, utilizing student-preferred formats such as cooperative performances and practical investigations to encourage

student participation and choice, promoting well-rounded development of multiple intelligences.

1.5.6.1 Plan to use artificial intelligence Process learning by using artificial intelligence for individuals in English language, there are three steps goal of learning, creative thinking, construction knowledge; pretest; post-test; assess students' satisfaction; check pretest and post-test.

1.5.6.2 Plan to enhance elementary school students' English learning outcomes through the application of elementary school English assignment designs guided by the Theory of Multiple Intelligences

1.5.6.3 Guide the process of students' assignment completion through the Theory of Multiple Intelligences, encompassing three steps: setting learning objectives, fostering creative thinking, and constructing knowledge; pre-test; post-test; evaluating student satisfaction; examining pre-test and post-test results

1.5.7 Data analysis

The statistics used to analyze data.

1.5.7.1 Evaluation of the efficiency of using the Theory of Multiple Intelligences to enhance student English learning outcomes based on experimental standards.

1.5.7.2 Comparison of pre-test and post-test scores for students under the guidance of the Theory of Multiple Intelligences.

1.5.7.3 Evaluation of student satisfaction with elementary school English assignment designs guided by the Theory of Multiple Intelligences using means and standard deviations.

1.5.8 Research questions

Research question in this study attempt to answer the following research questions:

1.5.8.1 How can the application of elementary school English assignment designs guided by the Theory of Multiple Intelligences enhance student performance?

1.5.8.2 What differences exist between pre-test and post-test scores for students using elementary school English assignment designs guided by the Theory of Multiple Intelligences?

1.5.8.3 What is the level of student satisfaction with elementary school English assignment designs guided by the Theory of Multiple Intelligences?

1.6 Definition and Scope of the Study

1.6.1 With the implementation and reform of new English curriculum standards, English assignments are becoming increasingly vital components of English classroom instruction. The primary task of elementary school English assignments is to internalize the learned content, enabling students to identify deficiencies through consolidation and seek better development. For teachers, assignment design and execution allow them to promptly gauge student performance and adjust teaching content and methods based on assignment feedback, facilitating the mastery of new knowledge and the consolidation of existing knowledge for improved learning outcomes. For students, completing English assignments involves internalizing knowledge, problem-solving, cultivating initiative, and creativity. However, in today's English education landscape, current elementary school English assignments have become disconnected from modern education mechanisms, failing to meet the demands of the era, teachers, and students. In terms of assignment content, most elementary school English assignments lack practicality and relevance to real-world issues or other subjects. In terms of assignment formats, assignments tend to be mechanical, imitative, monotonous, and lack variety. Regarding assignment presentation methods, assignments are often of uniform difficulty, neglecting individual students' developmental levels. As a result, many students feel helpless when faced with English outside the classroom, leading to a sustained decline in their English proficiency. Concerning assessment methods, teacher evaluation dominates, with students excluded from the evaluation process and lacking a sense of agency. In general, the design and implementation of elementary school English assignments fail to promptly meet the developmental needs of teachers and students. Prolonged neglect of this issue could diminish teachers' enthusiasm for teaching and students' enthusiasm for learning, hindering the smooth progression of English teaching and reducing classroom teaching effectiveness. Hence, reforming the design and implementation of elementary school English assignments is of paramount importance. Elementary school students are beings in development, unique

individuals, and hold independent significance. They are the core of classroom learning, and only when instructional approaches align with students' developmental needs can English teaching remain highly effective and progressive. When designing and implementing elementary school English assignments, it is essential to tailor them to students' developmental requirements. These assignments should cater to various types of students, possessing hierarchy and progression.

Throughout the process of completing English assignments, it's crucial to instill a sense of enjoyment, cultivate students' strong interest in English assignments, foster a sense of accomplishment, and build their self-confidence. The content of elementary school English assignments should not only emphasize entertainment but also be relevant to students' real-life situations, enhancing their problem-solving abilities. By exposing students to diverse assignment content and types, they can experience the joy of learning English. During the assignment completion process, they engage in thinking, collaboration, exploration, and communication, developing their innovative awareness, thinking skills, and teamwork abilities. This approach helps students not only engage with the subject of English but also encounter a plethora of cultural knowledge, natural understanding, and social awareness. This aids in broadening their horizons and learning to respect various cultural traditions.

Howard Gardner believes that every child possesses potential for development, and each individual should possess eight types of intelligence. Therefore, to ensure students' holistic development in both learning and daily life, it is crucial to value the diversification of students' intelligences. Grounded in the Theory of Multiple Intelligences, enriching elementary school English assignment designs can make them intriguing and stimulate students' learning motivation. Simultaneously, aligning English assignments with teaching content enhances their appropriateness, better addressing students' personalized needs and assisting in their development.

1.7 Definition of Key Terms

1.7.1 Theory of Multiple Intelligences

In 1983, the renowned American psychologist Howard Gardner introduced the Theory of Multiple Intelligences in his work "Frames of Mind: The Theory of Multiple Intelligences." Gardner proposed that various intelligences exist relatively independently within each individual:

1.7.1.1 Linguistic Intelligence: Linguistic intelligence is closely related to language use and understanding. Individuals with linguistic intelligence have a deep comprehension of vocabulary and strong language skills. Those who can effectively express their thoughts and insights using various strategies are referred to as having linguistic intelligence. Linguistic intelligence encompasses three main aspects: understanding textual information, organizing discourse content, and engaging in effective communication. Gardner stated that individuals with linguistic intelligence "can follow rules of grammar and can bend those rules as the occasion dictates". Therefore, individuals with high linguistic intelligence possess significant advantages in writing and speaking.

1.7.1.2 Musical Intelligence: Music is a universal human trait, and individuals vary in their musical intelligence. People with higher musical intelligence exhibit stronger responses to melodies and rhythms. Those with strong musical intelligence often excel as singers, performers, and more.

1.7.1.3 Bodily-Kinesthetic Intelligence: This type of intelligence involves the ability to control one's body adeptly and perform a series of complex and precise movements. Individuals with this intelligence display greater coordination in their physical actions compared to others. Generally, bodily-kinesthetic intelligence undergoes rapid development during childhood.

1.7.1.4 Logical-Mathematical Intelligence: Combined with linguistic intelligence, this forms the basis of intelligence tests. Individuals with strong computational and logical reasoning abilities excel not only in mathematics and calculations but also possess strong logical and expressive capabilities.

1.7.1.5 Visual/Spatial Intelligence: Visual/spatial intelligence refers to the ability to create specific external spatial models in the mind and manipulate them.

Those with strong spatial intelligence exhibit advantages in areas such as spatial orientation and the ability to construct visual representations.

1.7.1.6 Interpersonal Intelligence: Individuals with interpersonal intelligence possess strong interpersonal communication skills and can perceive emotions that others may not notice. They observe differences that others overlook. Teachers should possess interpersonal intelligence to effectively communicate with students, provide learning assistance, and guidance.

1.7.1.7 Intrapersonal Intelligence: Intrapersonal intelligence involves a clear and distinct understanding of one's own emotions, abilities, and actions.

1.7.1.8 Naturalist Intelligence: Individuals with strong naturalist intelligence have the ability to observe others and objects in their environment effectively, analyzing their essential characteristics and discerning differences.

1.7.2 Humanistic Theory

The humanistic theory closely linked to education was proposed by the famous American psychologist Abraham Maslow in the 1950s. Maslow introduced a student-centered perspective, a learning viewpoint, and an evaluation perspective, emphasizing that teachers play a role in facilitating students' growth. Teachers are to care for and nurture students. In educational activities, students are the primary focus, and all teaching activities should revolve around them. Schools should create a relaxed and pleasant learning atmosphere for students.

1.7.3 Assignment Design

Assignment design refers to the process of determining the content, type, quantity, completion time, and evaluation method of assignments. It is an important concept in the field of education, involving teachers purposefully arranging tasks or activities for students to complete outside of class based on educational goals and curriculum content. Assignment design aims to reinforce classroom instruction, cultivate students' learning abilities, stimulate their interest in learning, and encourage them to apply learned knowledge to solve practical problems. Assignment design should be premised on aligning with the goals of the curriculum, allowing students to integrate learned knowledge and develop good learning habits. High-quality English assignments can help students grasp the learned knowledge in a short time, cultivate a positive desire

for knowledge, and hold significant importance for their lifelong learning and development.

1.7.4 Assignment Evaluation

Assignment evaluation is the process through which teachers analyze, assess, and provide feedback on completed student assignments. Its purpose is to evaluate students' learning outcomes, understanding, skill application, and problem-solving abilities. Through assignment evaluation, teachers gain insights into students' performance during the learning process, helping students identify their strengths and weaknesses and guiding further improvement. During assignment evaluation, teachers can use predefined assessment criteria and goals for judgment. Different evaluation methods can also be flexibly applied based on assignment types, such as grading, comments, feedback meetings, and more. Assignment evaluation not only aids teachers in understanding students' learning progress but also serves as a crucial feedback mechanism for students' development, prompting them to engage in more targeted learning and improvement efforts.

1.7.5 Assignment Implementation

Assignment implementation involves teachers delivering designed assignment tasks to students and having them complete the assignments within specified time frames. This process includes conveying assignment content, requirements, deadlines, and related information to students. Students then complete the tasks as instructed and return the finished assignments to teachers for evaluation and feedback. Assignment implementation is a crucial aspect of the teaching process, aiding students in consolidating learned content, nurturing their self-directed learning abilities, and enhancing problem-solving skills. Simultaneously, assignment implementation requires timely guidance and direction from teachers to ensure students complete tasks as intended and achieve positive learning outcomes.

1.8 Significance of the Study

The research focus on the following:

1.8.1 Howard Gardner's Theory of Multiple Intelligences has garnered widespread attention and research globally. Scholars and experts have conducted

experiments and achieved substantial results. However, there are common characteristics shared by both researchers and frontline educators during the practical application of this theory:1) Subject-focused disparities: While the application of the Theory of Multiple Intelligences is well-established in subjects like language and mathematics, other subjects like English have seen relatively less research. This might be attributed to the stronger correlation between linguistic and mathematical subjects and certain intelligence types, while the connection with other subjects might be weaker. 2) Classroom teaching applications: The application of the Theory of Multiple Intelligences in education is predominantly visible in subject-specific classroom teaching. Educators design instructional activities based on different intelligence types to better meet students' learning needs, stimulate their interests, and unleash their potential. 3) Limited research on assignment design: Compared to its application in classroom teaching, research on applying the Theory of Multiple Intelligences to assignment design is relatively scarce. Given that assignment design constitutes an important part of students' learning experience, it holds potential for promoting diverse development. 4) Stage-based attention disparity: Research on the Theory of Multiple Intelligences is more prominent in middle and high school stages, with less focus on primary school stages. However, the fourth grade of primary school is a pivotal period when students transition from concrete to abstract thinking, making it crucial for unlocking their potential and fostering their learning abilities. Based on these insights, this study aims to conduct targeted research on the design of English assignments for fourth-grade primary school students guided by Gardner's Theory of Multiple Intelligences. At this age, students' cognitive development is undergoing a crucial transition, and tailored assignment design can better meet their developmental needs and stimulate their potential across multiple intelligence domains. This research will address the gap in applying the Theory of Multiple Intelligences to primary school education and provide valuable exploration and guidance for educational practice.

1.8.2 The Theory of Multiple Intelligences posits that each student possesses unique potential and strengths in various intelligence domains. Designing primary school English assignments based on this theory can effectively cater to individual differences, promoting targeted development in areas of strength and enabling

personalized learning paths. Such personalized assignment design not only sparks students' interest in learning but also enhances their motivation and self-confidence, allowing them to fully unleash their potential in various intelligence domains. Tailoring assignments to each student's strengths allows educators to better address their learning needs, fostering comprehensive development across multiple intelligence domains and paving the way for their future growth.

1.8.3 Designing English assignments based on students' intelligence types can effectively ignite their interest in learning. Diverse tasks and activities, such as music, imagery, role-play, and more, make assignments more engaging, thereby increasing students' enthusiasm and involvement in learning. Applying the Theory of Multiple Intelligences to English assignment design allows for customized tasks for each student, enabling them to showcase their talents in areas they excel in. For instance, students with strong musical intelligence can engage with tasks related to English songs, while those with robust spatial intelligence can participate in vocabulary jigsaw activities. Such personalized design triggers students' strong interest, encouraging them to actively engage in learning. Diverse tasks and activities create a more attractive learning environment for students, fostering enjoyment and a sense of accomplishment in their learning journey. By employing elements like imagery and role-play, abstract English knowledge can become more tangible and vivid, aiding students' understanding and mastery. This positive learning experience stimulates curiosity and a thirst for knowledge, enhancing students' learning enthusiasm.

1.8.4 English assignments designed based on the Theory of Multiple Intelligences can make education more personalized and diverse. This personalized assignment design allows each student to experience a sense of achievement in their areas of strength, significantly boosting their learning motivation and interest. Ultimately, this contributes to enhancing the quality of education comprehensively. Applying the Theory of Multiple Intelligences also enriches the learning experience. Students engaging in diverse English assignments involving music, drawing, teamwork, and more can develop skills in various domains, as well as comprehensive competencies and innovative thinking. This educational approach goes beyond traditional pen-and-paper assignments, fostering students' all-round development through practical activities.

Assignment designs rooted in the Theory of Multiple Intelligences grant education greater personalization and diversity. The sense of achievement students gain while realizing their potential fuels their learning motivation and interest, further elevating educational quality. Such an approach better caters to students' needs, fostering well-rounded development for each individual.

CHAPTER 2
REVIEW OF THE LITERATURE

This chapter focused on reviewing the previous studies related to the following area relevant to this research.

2.1 Introduction to multiple intelligences theory

2.2 Application of multiple intelligences theory

2.3 Multi-Intelligent Learning Center

2.4 Research on multiple intelligences of single subject and teaching

2.5 Significance of multiple intelligences theory

2.6 Influence of multiple intelligences theory on education

2.7 Relevant research

2.1 Introduction to multiple intelligences theory

In recent decades, driven by science and technology, especially the rapid progress of brain intelligence research, the traditional theory of single intelligence has been challenged by more and more new theories. Cognitive neuroscience research shows that relatively independent multiple intelligences are formed in the long-term evolution of the human nervous system, so every normal individual should have multiple intelligences, not just a single intelligence. The degree of development of intelligence and the different combinations of intelligence also create differences among individuals. In this situation, the single-view intelligence theory is gradually fading out, and the "multi-view intelligence theory", which not only conforms to the research results of cognitive science, but also respects the different intelligence development and individual differences of students, has attracted more and more attention and attention from all walks of life, especially administrators and teachers in the education sector. Representative multi-view intelligence theories include Thurstone's (1938) theory of Primary Mental Abilities, Guilford's (1956) theory of intelligent structure, and Stermberg's (1985) theory of three-dimensional intelligent structure. The most influential of these is the Harvard University psychologist Gardner's Theory of Multiple Intelligences (Theory of MultipleInteligences), which declared the bankruptcy of traditional intelligence bias, but also further the meaning of intelligence. It has been expanded and extended.

According to the traditional theory of IQ, intelligence is a kind of ability which exists in an integrated way with verbal ability and mathematical logic ability as the core (Wilhelm Sterm, 1912). According to this theory, other than verbal ability and mathematical logic ability, other intelligence is worthless. Gardner was an opponent of this single view of intelligence. Gardner argued that as understanding of the human brain grows, and the types of roles and skills that are valued in various cultures, the definition of intelligence must be combined with two factors: an individual who can use his or her abilities proficiently in different domains, The second is a society that nurtures these individuals by providing opportunities, educational organizations, and values. For this reason, Gardner redefined intelligence as "the ability of individuals, in a given socio-cultural context, to solve real problems they face and to produce and create effective products that society needs". Gardner further defines intelligence as "the physical and psychological potential of an individual to process information in a cultural environment, which can be activated by the cultural environment to solve practical problems and create products that the culture values". Compared with the original concept, Gardner's concept of intelligence has the following two characteristics: First, intelligence is seen as potential, no longer visible to the naked eye; Second, and most important, potential may or may not be activated depending on the opportunities available in a particular cultural context and the individual's different choices. Gardner offers an interesting explanation for the inspiration for multiple intelligences. He talks about two things: First, as a child, he loved art and was very good at the violin and piano, but these skills were irrelevant to traditional IQ tests, so he wanted to find a place for these skills in the development of intelligence; Secondly, in most cases, people's strengths are shown in an unbalanced form. A large number of research results in the field of brain physiology show that the damaged areas of the brain damaged are different, and the lost ability is different, and the remaining ability exists independently, indicating that there are multiple components of human intelligence. In addition, Gardner found that the development of human intelligence follows a certain trajectory, that various types of intelligence are a part of the genetic inheritance, and that the primitive ability to imitate is the original source of each intelligence. So, with the exception of specific groups at one time or another, humans normally have certain basic abilities for every intelligence.

On the basis of the above tests, Gardner improved and confirmed eight criteria for judging the existence of intelligence from the fields of life science, logical analysis, developmental psychology and traditional psychology. Two criteria from life science: different abilities still exist independently after brain injury; Evolutionary history and the credibility of evolution - Evolutionary psychologists work backwards from contemporary representations of human abilities to try to infer the selection pressures (evolutionary pressures) that have led to the development of particular human organs and abilities over millennia. Two criteria from logical analysis: the ability to identify one or a set of core competencies; Ability to encode and sensitivity to the use of symbolic systems - because mature symbolic systems correspond to relevant intelligence. Two criteria from developmental psychology: different intelligences have unique development history; The simultaneous existence of idiots, prodigies and other abnormal people. Two criteria from traditional psychology: Support from experimental psychology: The study of mutual transfer of intelligence (usually good) or mutual intervention (bad) helps separate different intelligences by observing how people perform two intelligent activities at the same time to determine the degree of correlation between the two intelligent activities; Support for psychometrics - although the theory of multiple intelligences is a critique of it. Using the above eight criteria, Gardner proposed the theory of multiple intelligences, that is, eight intelligences that exist relatively independently in individuals and are associated with specific cognitive domains and knowledge domains. Every intelligence operates according to the ultimate state of that intelligence, which is the optimal performance of a person who depends to a great extent on some particular intelligence and plays certain social roles that society recognizes and values.

2.1.1 Speech-language intelligence (linguistic intelligence)

It is the ability of individuals to describe, express and communicate fluently and efficiently, that is, the ability of "listening, speaking, reading and writing" in the usual sense.

2.1.2 Logic-mathematical intelligence

It refers to the ability to think through mathematical calculations and logical reasoning. This intelligence is sensitive to the various relationships between things, such as analogy, contrast, cause and effect, and logic. These two kinds of

intelligence are currently the most valued in schools, and most of the school's teaching activities are almost centered around the development of these two kinds of intelligence. Exploration and exploration as the core of reinforcement learning.

2.1.3 Music-rhythmic intelligence

The ability to feel, recognize, remember, create, change, and express music, as demonstrated by sensitivity to music (such as rhythm, tone, timbre, and melody) and the ability to express music through composing, playing, and singing. People who are good at this intelligence are usually able to distinguish intonation easily, are sensitive to rhythm, and are good at playing Musical Instruments, which is the saying "musical sense".

2.1.4 Visual-spatial intelligence

The ability to express thoughts and feelings by feeling, recognizing, remembering, and changing the spatial relationships of objects, as demonstrated by an extreme sensitivity to structure, line, color, shape, and spatial relationships, as well as the ability to communicate through planar graphics and three-dimensional modeling. The ability of the above relationships to manifest

2.1.5 Intrapersonal intelligence

It refers to the ability of individuals to know, insight and reflect on themselves, which is embodied in the ability of individuals to correctly understand and self-evaluate their emotions, motivations, desires, personalities, will and other aspects, and form self-respect, self-restraint and self-control on this basis.

2.1.6 Interpersonal intelligence

It refers to the ability of individuals to know, insight and reflect on themselves, which is embodied in the ability of individuals to correctly understand and self-evaluate their emotions, motivations, desires, personalities, will and other aspects, and form self-respect, self-restraint and self-control on this basis.

2.1.7 Bodily-kinesthetic intelligence

It refers to the ability to use the body, as shown by the ability to better control their body, to make appropriate physical responses to events, balance, strength, coordination, agility and speed, and the ability to use body language to express their thoughts and emotions.

The above three kinds of intelligence are particularly prominent in the art leading city.

2.1.8 Naturalist intelligence

This intelligence was added later and is also translated as naturalist intelligence or natural intelligence, referring to the individual. The ability to identify, classify and utilize the characteristics of different environments, and judge the internal connections between various phenomena and different things produced by different environments, and know how to love and adapt to nature, and the ability to investigate and study. Suitable careers include plant or zoologist, environmentalist, etc. In addition, there are three candidate intelligences: existential Intelligence. Moral intelligence (morality Intelligence) and spiritual intelligence (spiritual Intelligence). According to the criteria of logical analysis, the core competences of existential intelligence are: the ability to position itself in the universe that is as accessible as possible (including infinitesimal and infinitesimal), the ability to position itself in major questions such as the meaning of life and death, the ultimate fate of the physical and inner world, and the ability to position it in profound experience. Although various cultures have invented religious, mythological, or metaphysical systems to solve existential problems, it is difficult to develop a mature symbolic system to match them.

The core components of moral intelligence include two points: first, the perception of the status of personal intermediary and personal gain; The second is the recognition of the irreplaceable role played by the individual relative to others, and that the actions of the individual for others must reflect the results of contextual analysis and the voluntary practice of the individual. At its core, the field of morality is concerned with the laws, behaviors, and attitudes that govern the sanctity of life, particularly the sanctity of human life, but also the sanctity of other beings living in this world. The field of ethics is also concerned with the ability to discern and make judgments about moral issues.

The "content" of mental intelligence has many puzzling qualities, and it may define the emotional and phenomenal domains in truth. The value aspect has priority but is not proven, and it needs to be partially discernible by its impact on others. Thus, there is only one connotation of mental intelligence that seems to be consistent

with other intelligences, the ability to think about the universe and existential questions - from our existence and function in the universe to the nature of life, death, happiness, and sadness. Therefore, according to Professor Gardner's criteria for intelligence, it is concluded that existential Inelligence is only half intelligence, while neither moral intelligence nor spiritual intelligence is a new intelligence.

In summary, Gardner refined and confirmed eight criteria for judging the existence of intelligence from the fields of life sciences, logical analysis, developmental psychology, and traditional psychology. Using the above criteria, he proposed the theory of multiple intelligences, that is, eight kinds of intelligences that exist relatively independently in individuals and are related to specific cognitive fields and knowledge fields: speech-language intelligence, logic-mathematical intelligence, music-rhythm intelligence, visual-spatial intelligence, body-movement intelligence, introspection intelligence, interpersonal intelligence and natural observation intelligence. Every intelligence is based on the ultimate state of that intelligence - the ultimate state is in. To a large extent, the best performance of people who rely on certain kinds of intelligence and perform certain social roles that society recognizes and values. In addition, Gardner (2004b) also proposed three candidate intelligences, and based on the criteria for judging intelligence, concluded that existential intelligence was only half intelligence, while neither moral intelligence nor spiritual intelligence could be considered new intelligence.

2.2 Application of multiple intelligences theory

At present, the theory of multiple intelligences has been widely used in a large number of teaching methods research and development exploration. From the perspective of foreign applications of the theory of multiple intelligences, such as a large number of cross-cultural studies on verbal and linguistic intelligence, the aim is to reduce the difficulty in the second language learning process and develop language teaching methods that adapt to their respective cultures through the application of the theory and methods of multiple intelligences (Shuhua Wu & Sulaiman Alrabab, 2009; Amir Rouhshad, 2011). These studies also found that in foreign language teaching in many countries, too much emphasis is placed on language skill learning while other kinds of intelligence are ignored in language learning, which calls for a reform of

teaching materials and classroom models (Reza Abbasian &Yaser Khajavi, 2012). Azizullah Mirzaei et al. 's quality assessment of outstanding Iranian learners also verified the importance of verbal to linguistic intelligence, logical to mathematical intelligence and introspection intelligence in the process of foreign language learning. In foreign language education, teachers need to build a language environment to help students strengthen their metacognition of the language they learn. In other areas of teaching, the theory of multiple intelligences has a wide impact. For example, Serkan (2011) believes that educational and teaching strategies based on multiple intelligences theory have a more positive impact on teaching effects than traditional educational and teaching methods. Dilek I., and Kamuran, T. (2009) also designed Collaborative Learning Multiple Intelligence (CLMI) based on the theory of multiple intelligences. Angela Clarke & Peter Cripps (2012) believe that the art teaching model based on the theory of multiple intelligences is helpful to develop students' creativity. The theory of multiple intelligences has been widely used in the field of basic education in the United States, Australia, Taiwan, Hong Kong and other Asian countries and regions, but it is rarely applied in the stage of higher education (Kezar, 2001). Only Emie Barington (2004) tries to explore the application of this theory in the field of higher education. To promote the use of diversified teaching strategies in universities.

Of course, there are some different propositions in the practice of multiple intelligences theory. Zhang Xiaofeng (2002) believes that in some schools carrying out multiple intelligence experiments in the United States, a small number of teachers refuse to adjust their curriculum and ignore the richness and uniqueness of each student's multiple intelligence. From the perspective of the application practice of the theory of multiple intelligences in the world, with the introduction and continuous practice of the theory, the world's educational concept, student evaluation, teaching reform, teacher quality have produced positive changes.

2.3 Multi-Intelligent Learning Center

The learning center of multiple intelligences is to arrange a learning place in the classroom for students with different intelligences. In the learning center of multiple intelligences, students can carry out activities in it and also get some experience in their

own learning center. Students can choose their preferred learning center, where students can work together or alone. The steps of establishing the center are as follows (Kagan & Kagan, 1998) : First, define the goals of the multi-intelligent learning center; Second, activities to create multiple intelligence centers; Third, prepare the work and materials of the multi-intelligent learning center; Fourth, the time of the multi-intelligence learning Center: students enter the learning center and focus on the activities; Fifth, evaluate the multiple Intelligence Learning Center.

It must be further explained here that in order to cultivate the overall ability of students and inspire children's multiple intelligences, teachers should take into account as far as possible the eight intelligence fields can be used in the design of the learning center, and the design method can be a single intelligence field as a learning center, so there will be eight different learning centers. The name of the learning center shall be determined by teachers and students through discussion, and may be represented by the names of outstanding performers in the field or with distinctive names. The materials and equipment of each learning center can be increased or decreased in accordance with the content of the class, so that the learning content of students can be deepened or broadened. Examples of materials and equipment of each center are as follows: Language center (storybooks, audiobooks, manuscript paper, reading notes); Logical mathematics Center (electronic calculator, mathematical blocks, fake money, ruler); Space center (watercolor, cutting pad, colored pen, colored paper, clay); Limb operation centers (Frisbee, hula hoop, building blocks, clay, balls); Music centre (tapes, recorders, instruments); Interpersonal center (chessboard, pieces); Introspection centers (computers, comfortable chairs, private Spaces); Nature center (aquariums, pet boxes, animal and plant specimens, garden tools).

As for the management of the learning center, attention must be paid to the discipline of students when working alone, as well as to help students move from one activity to another. The implementation of the learning center can be divided into the following stages:

2.3.1 The guidance period

The orientation period may be extended for several months. The purpose of the orientation period is to inform students about the selection and handling of the

activities of the learning center, and to give students the opportunity to explore in advance, especially the parts that students are interested in. Teachers can also perceive the strengths and interests of students in this period.

2.3.2 Activity implementation

Teachers should practice at least twice a week for two hours. The learning center can be used at the time of students' choice, before or after regular school activities, or even flexible time, or for students who have completed their work.

2.3.3 Classroom design

Each learning center can be individually color-coded to help students identify and align materials with each area. Space arrangements in classrooms, science and art centers should be close to sinks for easy cleaning. Language and social centers can be set up together because they share some materials. Where space is available, the Music and Sports Centre should be separated from other areas to reduce noise disturbance.

2.3.4 Establish rules

During the orientation period, teachers can brainstorm with students to produce the rules for each center, and once the rules are established, teachers can remind students that the rules are established to assist them in their play and work, and can be revised if the rules do not apply.

2.3.5 Activity leaders and cooperative learning

Teachers can train some students to be primary teachers of learning centres. On the one hand, the primary teachers can gain a sense of honor and confidence, and on the other hand, other students can get help. Students learn together in the learning center, giving full play to the spirit of cooperative learning.

2.3.6 Sharing time

At the end of the learning center, teachers can guide students to further explore the problem or recall, reflect, share the activities and learning results.

2.4 Research on multiple intelligences of single subject and teaching

Using the view of multiple intelligences to design the course unit of a certain subject will make it easier for teachers to present the content of the textbook to students in a variety of ways, so that students can achieve a deeper understanding of the knowledge. The steps of multi-intelligence curriculum design are as follows:

2.4.1 Defining the curriculum objectives of multiple intelligences: What can we say about what students must learn? What do we want our students to learn? What do students want to learn? To set goals. Here are some ways to describe the goals:

Language intelligence: can explain, can speak, can describe, can write, can create, can publish, can read, can imitate, can analyze, can comment, can apply, can listen

Logic mathematical intelligence: can calculate, can write the formula, can compose the formula into a story, can sort, can compare, can analogy, can solve, can identify, can operate.

Spatial intelligence: can create, can combine, can imagine, can draw, can make, can design, can read a map... kinesthetic intelligence: can perform, can engage, can play, can operate, can make, can do

Musical intelligence: can recognize, imitate, can associate with various sounds, can emit, can express, can appreciate, can sing, can create, can express music

Interpersonal intelligence: can accept, can imitate, can establish a good peer relationship, can show, can recognize, can solve, can perceive, can appreciate, can share with others

Introspective intelligence: can express, can experience, can show, can understand, can express themselves through various symbols, can control, can devote, can focus, can reflect

Natural exploration intelligence: can recognize, can remember, can operate, can personally touch, can investigate, can participate, can care

2.4.2 Designing activities of multiple intelligences: arrange activities of many different intelligences to achieve the objectives of the course. At this stage, it is not necessary to consider the order of activities for the time being and try to use brainstorming methods to create various activities.

Refer to the cell - Smart Matrix table (see Table 1) for design. The number of activities to be designed depends on the teaching objectives and the available time. It is worth noting that not all eight intelligent activities need to be used in every lesson. This view was mentioned by Checkley(1997) : If everything should be taught in seven or eight ways, it is meaningless. This is not the view of the theory of multiple intelligences, but that any subject and any subject should be taught in more than one way.

2.4.3 Arrange the order of multiple intelligence activities: when arranging the order of activities, it is necessary to consider the logical order and the fluency of teaching, in addition, it is necessary to pay attention to the environment, input, check the understanding of the situation, guide the implementation, the student's own implementation, the end and other elements.

2.4.4 Courses showing multiple intelligences: In teaching, teachers hope that students can invest in courses with multiple intelligences orientation, combine their own superior intelligence with the course content, and teachers can adjust and revise the plan according to the situation at any time.

2.4.5 Evaluation of the Multiple Intelligences course: Evaluate whether the students have learned the content of the topic, what the students still need to strengthen, and whether the introspection course has achieved the teacher's own goals.

2.5 Significance of multiple intelligences theory

2.5.1 Every intelligence is equally important

Intelligence no longer consists of logic and words. Traditional intelligence, with linguistic intelligence at its core, is equally important in the development of the individual, just as one cannot easily compare Stalin, Beethoven, Einstein, Da Vinci, and Socrates with one another. Each intelligence has its own characteristics, and the judging criteria must also be multiple.

2.5.2 Everyone has all the intelligence

The theory of multiple intelligences suggests that because each ability follows a similar trajectory and is initially derived from imitative behavior in infancy, everyone is born with the basic abilities of various intelligences. However, each person's

degree of development and combination of various intelligences will be different due to genetic and environmental factors, and will eventually integrate their own multiple intelligences in their own way. .

2.5.3 Intelligence is integrated

Gardner (2004a) points out that each intelligence is not a capability or ability centered, but always co-exists, works cooperatively, and coexists peacefully, and is a unique mode of thinking. Independent intelligence in everyday life does not exist (except for a very small number of experts and people with brain injuries).

2.5.4 Intelligence comes in different forms

Intelligence is no longer a characteristic that can be measured by the same standard across time and space in the traditional sense, and each intelligence contains multiple sub-intelligences (Wu Shu, 2005). For example, a person with excellent body-sports intelligence can play basketball very well, but he is not good at dancing.

2.5.5 Most people's intelligence can be fully developed

The theory of multiple intelligences states that each person has the ability to develop various intelligences to their own level. Of course, the level of intelligence development is different with different social and cultural backgrounds of individuals. Each culture or society has different assessment standards and requirements for different intelligence, which makes individuals develop different aspects of intelligence under different motivations, which also explains why people's certain intelligence has different development in certain social environments.

2.6 Influence of multiple intelligences theory on education

2.6.1 The development of students' creative ability should be vigorously promoted.

Under the theory of multiple intelligences, Gardner defines intelligence as "the ability to solve real problems faced by oneself and to produce and create effective products needed by society", which requires us to pay attention to cultivating students' creative ability. Because in the theory of multiple intelligences, the development of intelligence is to make comprehensive use of all intelligence, and then improve the

ability to creatively solve new problems that have not been encountered in real life.

2.6.2 Establish a new diversified evaluation concept

The theory of multiple intelligences holds that every individual is different, that each person has a different intelligence, and that education is effective only if these differences are not ignored or denied. Taking differences within humans seriously is central to the theory of multiple intelligences. The premise of traditional unified schooling is that everyone is the same, so that everyone can be taught and evaluated in the same way. Recognizing the diversity of intelligence is the basic premise to encourage and support the existence of diversity. When we treat and evaluate students' intelligence combination and learning ability with a scientific and inclusive attitude, we can evaluate and affirm students' intelligence and learning ability more fully

The uniqueness of the force, the real realization of individualized teaching.

2.6.3 Focus on identifying and developing students' strengths in smart areas and migrating to other smart cities

The theory of multiple intelligences holds that every student is relative to others as well as to himself. In the field of dominant intelligence (Gardner, 2004b), for example, students' expressions and solutions to the same problem may be expressed through music or drawing, or explained by words or mathematical formulas. Therefore, when evaluating students, we should adopt the methods and means of multiple evaluation, at the same time, we should guide and explore their advantages in the field of intelligence, and transfer the excellent quality of their comparative advantages to the relatively weak field of intelligence, so as to truly achieve comprehensive development.

2.6.4 Construct a new personalized course design idea

The theory of multiple intelligences challenges the traditional unified curriculum design. According to the concept of multiple intelligences theory, courses should be personalized to adapt to students with different intelligence distribution characteristics. At the same time, a variety of teaching methods such as sound, photoelectric and field visits should be comprehensively adopted to adapt to the acceptance habits of students with different intelligence distribution characteristics.

2.6.5 Advocate a positive and optimistic view of students

From the point of view of the theory of multiple intelligences, we will find that the level of intelligence between students is different, although some students have the same strong intelligence, but everyone also has their own unique characteristics, they have their own methods to acquire knowledge. If everyone develops according to their own characteristics and learning methods, there will be no "poor students" phenomenon. Therefore, as a teacher, we should fully understand the strong intelligence of each student and the learning characteristics of each student. Teachers need to give appropriate guidance to each student so that each student's intelligence can be developed to a certain extent. Therefore, our education to students should create more space for students to develop their intelligence. However, it is also necessary to encourage students to develop their own personality, fully display their own advantages, and make up for their shortcomings, so as to save the lost. As a teacher, we should be patient, positive and optimistic, we should treat students with a developmental perspective, believe that they have a strong potential, help students find and cultivate their own advantages, and students can have a bright future.

2.6.6 Promote personalized teaching methods

The theory of multiple intelligences suggests that each person has a different degree of inclination towards intelligence. The fact that an individual is more intelligent in one aspect does not mean that an individual can achieve the same level of intelligence in other aspects. Therefore, when giving educational guidance to students, teachers should have a deep understanding of the intellectual development of each student, and know that it is normal for students to have differences with students. They should treat students with an inclusive attitude, so that students can develop in multiple directions and promote their personal growth. In mathematics teaching, teachers should encourage students to speak actively. Teachers should also teach students how to think and solve difficulties from multiple angles when facing them.

2.6.7 Emphasize the diversity of teaching methods

It can be seen from the theory of multiple intelligences that although students have different degrees of tendency in various aspects of intelligence, they can also exert different degrees of effect in the practice process. Therefore, mathematics

teachers should design different teaching schemes according to the students' intelligence strength, and choose appropriate teaching methods to teach students according to their aptitude, so as to make them develop comprehensively. This requires teachers to help students introduce the strong aspects of their intelligence into the weak areas, so as to promote the development of the weak intelligence. This is in line with the requirement of the new curriculum standard that teaching should be carried out around the students, and the use of a variety of teaching methods in teaching can make students' learning achieve better results.

2.6.8 Advocate the diversification and contextualization of evaluation

Evaluation can guide the direction of teaching. Teacher evaluation has two sides, which may have a positive guiding effect on students, but also may hinder the development of students. Therefore, teachers should grasp the opportunity and use it reasonably when making evaluation. In the past teaching, students' achievements were often regarded as indicators to evaluate a student's ability, and it was difficult to make a correct and appropriate evaluation of their various intelligence conditions, and it was also difficult to evaluate students' innovation and practical ability. According to the theory of multiple intelligences, teachers should reform the concept of taking academic performance as an important evaluation method, face up to the differences among students, and adopt multiple evaluation methods to evaluate students with different intelligent tendencies. Comprehensive evaluation is guided by the theory of multiple intelligences. Teachers can design a variety of situations for students in the teaching process, so that they can explore and solve problems by themselves in the situation, which can well show their own inquiry process, and evaluate them in this process to test students' ability to innovate and deal with practical difficulties. Therefore, teachers should know how to deeply analyze the advantages and disadvantages of students in different situations, and evaluate students comprehensively. Finally, constructive suggestions are provided to students based on the evaluation conclusions. For teachers, they should also improve the teaching activity plan according to the performance of students, so that teaching activities can be centered on students and teaching efficiency can be better improved. Such evaluation can diversify the development trend of students.

2.7 Relevant researches

Here is numerous research which can be applied to investigate to be accomplished via way of means of researchers.

Yaghoob Raissi Ahvan* and Hossein Zainali Pour (2016) studied attempts to investigate the relationship between the multiple intelligences and the academic performance achievement levels of high school students based on Gardner's multiple intelligences theory. This was a descriptive correlation study. To accomplish this purpose, 270 students of high school of Bandar Abbas selected by clustering random sampling, and all of them filled the Gardner's multiple intelligences questionnaire. For analysis of collected data, descriptive statistics including Mean, Standard Deviation, Pearson coefficient correlation and regression were used. Findings of this study revealed that moderate inter-correlation exists between verbal-linguistic and visual-spatial intelligences and academic performance achievement ($p<05$). Multiple intelligences such as logical-mathematical, visual-spatial, verbal-linguistic, intrapersonal, bodily-kinesthetic, interpersonal and naturalistic have a significant positive relationship with academic performance achievement of students ($p<05$). It became clear that multiple intelligences like visual-spatial, verbal-linguistic and interpersonal statistically significant and were able to predict academic performance achievement ($p<05$), whereas musical intelligence was a tunable negative predicator for academic performance achievement of students.

Linda Campblee; Bruce Campbell & Dee Dickinson (2003) studied the influence on pedagogy, team teaching, student advantage, curriculum, evaluation, community participation and diversified classroom models. It is designed for teachers who want to teach all types of learners effectively. In one chapter, the author introduces eight kinds of intelligence: language-language, logic-mathematics, kinesthesia, vision-space, music, interpersonal relationship, personal internality and naturalism. They define intelligence, provide a checklist to identify intelligence, suggest environmental considerations, and provide relevant teaching strategies. Other chapters provide an overview of the work on the results of Canadian and students. For classroom teachers, school psychologists and anyone interested in intelligence.

CA Hughes, KL Ruhl, JB Schumaker, DD Deshler (2010) studied homework is an important activity in the lives of school-aged children, including students with learning disabilities (LD). Characteristics often associated with LD (e.g., poor organizational skills) may adversely impact the rate and quality of homework completion. In this study, a multiple-probe across-students design (Horner & Baer, 1978) was used to evaluate the effects of instruction in a comprehensive, independent assignment completion strategy with regard to homework completion rates and the quality of products completed in response to assignments given in general education classrooms. Eight of nine students mastered use of the strategy, and their homework completion rates and the quality of their homework products improved. Associated with these improvements were increases in quarterly grades and teacher ratings of the quality of the assignments.

Silver Harvey F. (2001) research indicates how to achieve the same high level of academic achievement for all students while encouraging and accommodating student diversity? Multiple intelligences and learning styles, two effective learning theories, provide us with the best weapons to deal with this challenge. However, both theories have advantages and disadvantages, and they work best when they are integrated into a whole. The basic theories and research-based learning principles supporting integrated learning are expounded. Share rich classroom teaching examples to help educators put ideas into practice and analyze their own teaching practices; To provide educators with an evaluation tool to define their own style type and intelligence profile; To help educators design integrated curricula, instruction, and evaluation.

Carolyn Chapman(2011)analyzes the theoretical basis for teachers to promote different intelligences in students, and the personalized teaching strategies that teachers should adopt in the teaching process. In particular, it provides a wealth of examples of teaching activities suitable for high school, middle school, and elementary school to guide teachers to understand, master, and apply multiple intelligences in the classroom. The style of the book is lively and easy to understand. With the help of different kinds of shoes, the author cleverly reflects the respective characteristics of seven kinds of intelligence, so that teachers and students will have a deep impression on each kind of intelligence. For teachers with reflective consciousness, this is a book with solid

theoretical foundation and rich teaching cases, which has certain theoretical value and practical significance for curriculum reform and primary and secondary school teaching.

Yuxing (2010) research finds that the 21st century calls for the wisdom of paying attention to human life and morality, the wisdom of efficiently harnessing knowledge and technology, the wisdom of practice, and the wisdom of development. The "Wisdom Manifesto" of the 21st century warns us: "with yesterday's knowledge, teach today's students, so that they can serve tomorrow", has become very difficult, "multiple intelligence theory", to develop human potential and enlightens human wisdom as its mission, it says: If we can maximize the full range of human intelligence and integrate it with ethics, we will increase our chances of continuing to survive on Earth and thereby contribute to the prosperity of the world. Every child is a potential genius, but it often manifests itself in different forms; To make education the most successful for everyone; The pre-university education must take into account the multi-aspect and connotation of the new century; With the development of the post-industrial economy, it is no longer appropriate to rely solely on non-contextualized learning to develop intelligenc. "Teaching for Multiple intelligences" and "Teaching with multiple intelligences" will help us turn the school into a paradise of "colorful spectrum", make teaching a place of multiple interactive contextualization, and effectively improve students' innovative spirit and practical ability.

Duhuimin(2016)research found that with the development of the society, children's education has been more and more concerned by the society and parents. How to adapt to the changes and development of society and keep up with the pace of The Times is a problem worth thinking about for every educator. As one of the important theories affecting the reform of basic education in recent years, the theory of multiple intelligences has injected new vitality into the development of education and provided new ideas for quality education. The application of the new educational concept of multiple intelligences theory to daily teaching activities can make teachers' teaching concepts constantly updated, teachers' teaching methods more diversified, and provide students with new learning ideas, so that students can grow and develop more comprehensively. In this paper, the theory of multiple intelligences is applied to high school by taking "Economic Life" in high school ideological and political class as the

starting point. First of all, by referring to the research achievements of relevant experts and scholars at home and abroad, combined with the development of basic education curriculum reform and the existing problems in high school, the research background and significance of this paper are expounded. Secondly, the connotation and specific content of the theory of multiple intelligences are discussed, and the characteristics of the theory of multiple intelligences are analyzed, and the necessity of applying the theory of multiple intelligences in high school is explored. Then, combined with the book "Economic Life" of high school, select several classes as cases to explain, apply the theory of multiple intelligences to them, and analyze its teaching effect concretely. Finally, the application of multiple intelligences theory in high school curriculum is reflected, and the advantages and disadvantages of it are analyzed.

Jiangchenchen (2015) research found that teachers often pay more attention to classroom teaching in primary school English teaching, but ignore the practice of homework. This study is based on abundant literature research, constructivism theory, behaviorism learning theory, input and output theory, interactive learning theory and other theories, and adopts literature research method, questionnaire survey method and case study method to conduct in-depth and comprehensive research on primary school English homework. The goal of this study is to let students get out of the dilemma of passive learning, take the initiative to complete homework and feel the joy of success brought by the completion of homework, cultivate students' learning interest and learning ability, establish confidence in learning English well, develop good English learning habits, master correct English learning methods, improve the ability of practical use of language, and develop exploration and cooperation At the same time, this study is helpful to effectively reduce the learning burden of primary school students and achieve reducing the burden and increasing efficiency. On the basis of theoretical research and empirical research, four principles of assignment design are established: the principle of combining interest and culture; The principle of combining difference and diversity; The principle of combining oral and written work; The principle of combining typicality and comprehensiveness. At the same time, based on the importance of homework and the subject characteristics of English homework, the selection of homework content should not only reflect the interest, close to students' life and practical, but also must be

comprehensive and conform to the law of cognitive development of primary school students. On this basis, it also classifies the types of primary school English homework, which are exploratory homework, creative homework, task-based homework and cumulative homework, and lists the cases of the four types of homework.

Li Han (2018) study found that some students had problems such as "lack of interest and motivation in learning grammar", "difficulty understanding grammar rules" and "inability to use grammar flexibly". The abstractness of grammar itself makes the learning of grammar relatively boring, obscure and difficult to understand compared with the learning of other language skills. It is necessary to use the relevant theories of language teaching and existing technologies to help learners learn grammar effectively. Through investigation and interview, this study also learned that students are in favor of grammar teaching in the information technology environment. The reality of the information technology environment is that each school has different information environment conditions, but basically has a simple multimedia environment of "computer + projector". As far as English grammar demonstration teaching is concerned, this environment can fully meet the needs of multimedia environment in teaching. Based on the above considerations, this study integrates metaphor strategies into the design of English teaching demonstration courseware based on metaphor theory and multimedia learning cognitive theory, and applies the courseware to the explanation and practice links in teaching, so as to stimulate learners' interest and motivation in grammar learning and promote learners' in-depth understanding and flexible use of English.

Elena Spirovska (2013) studied the applicability of multiple intelligences theory in foreign language teaching. This paper also illustrates the adaptability of the theory to teaching English as a foreign language and foreign language teaching by describing a set of activities and lesson plans that use the MI method. This paper reviews the types of intelligence described and defined by Howard Gardner and other authors who have followed and modified this theory from a language teaching perspective. In addition, this paper also discusses the different application models of multiple intelligences theory in language teaching for teenagers and adult foreign language learners. Articles are conducted by grouping and listing possible activities and tasks suitable for language learners of different abilities or intelligence.

CHAPTER 3
RESEARCH METHODOLOGY

This paper will investigate the application of the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students in China. It will counter questions through a thorough investigation using quantitative methods to collect and analyze data. The researchers discuss the methods employed in this chapter, which are dedicated to conducting this study. This methodology comprises the following components:

3.1 Research Design

3.2 Population and sample

3.3 Research Instrument

3.4 Data Collection

3.5 Data and Statistical Analysis

3.1 Research Design

The research design was conducted according to the following structure in the objective of the research; it has been moving with steps as flowing:

The researcher used a quantitative approach in experimental design for conducting this study. The data was collected in a quantitative or numerical form derived from the test, and the researcher used a one-group pretest-posttest design. This design included a pretest measure followed by a treatment and a posttest for a single group. An illustration of the design is as follows:

Group: O1 x O2

O1 = Measurement of the pretest score

X = Teaching Activity of Enhancing English Proficiency through Elementary School English Homework Design Guided by the Theory of Multiple Intelligences

O2 = Measurement of the achievement of the posttest score

3.2 Population and sample

3.2.1 The study subjects were all 54 fourth-grade students from Class 5 of Chongqing No. 8 Primary School in the 2021-2022 school year.

3.2.2 In the second semester of the 2021-2022 school year in Chongqing No.8 Primary School, the researchers adopted a purposeful random sampling method to randomly select classes in the fourth grade of the whole school. Since English teaching in Chongqing starts from the third grade, students in the third grade have just come into contact with English and have a weak foundation. After one year's study, students in the fourth grade are in a period of rapid development of their English level and have mastered a certain English knowledge foundation. Moreover, the difference in students' scores is small, which is convenient to analyze the changes in students' scores before and after homework design. Test the implementation effect of job design under the guidance of multiple intelligences theory. This English homework design study selected all the students of Class 5 of Chongqing No. 8 Primary School as the research object, a total of 54 students.

3.3 Research Instrument

The researcher has defined the following instruments:

3.3.1 By means of questionnaire, student interview and text analysis, this paper makes a preliminary understanding of the current situation of English homework design in primary schools.

3.3.2 Based on the analysis of the existing problems in the design of primary school English homework, this paper carries out the design and implementation of primary school English homework from four aspects: homework content, homework type, homework presentation and homework evaluation.

3.3.2.1 Design of Homework Content

In the aspect of designing homework content, the theory of multiple intelligences serves as a guide, reflecting its diverse characteristics. In the experiment, based on the variations in students' development of multiple intelligences, more diverse and practical homework content is designed. This ensures that the homework content is closely related to students' actual lives, helping them effectively apply the acquired knowledge to solve real-life problems. The design of homework content can be based on the following combinations of multiple intelligences:

1) Naturalistic Intelligence and Intrapersonal Intelligence: Homework is an important means for students to assess their understanding of knowledge and serves as a fundamental basis for self-evaluation. Students need to deeply understand themselves, recognizing their strengths and weaknesses, and effectively choose homework based on their English learning levels. By applying homework to real-life situations, students complete homework in their daily lives, achieving learning outcomes, and nurturing naturalistic observation intelligence and intrapersonal intelligence.

2) Linguistic-Verbal Intelligence and Bodily-Kinesthetic Intelligence: English, being a language, primarily emphasizes the development of students' language skills. When designing English homework, attention should be paid to developing students' linguistic-verbal intelligence, while also considering the development of their bodily-kinesthetic intelligence. This encourages students to integrate both cognitive and physical aspects.

3) Interpersonal Intelligence: When students complete group assignments, they engage in interpersonal interactions with fellow group members. They communicate, exchange ideas, understand the characteristics and strengths of other members, develop a sense of cooperation, and foster communication skills. Therefore, the process of completing assignments is also a process of developing interpersonal intelligence.

3.3.2.2 Design of Homework Types

In terms of designing homework types, diversity and innovation should be emphasized. Homework types should be as varied as possible, creating a sense of novelty for students and stimulating their interest in completing assignments. The design of homework should make use of various curriculum resources and incorporate multiple intelligences. It should adopt formats that students enjoy, such as collaborative performances and practical investigations. Encouraging students to participate in various types of homework and allowing them to freely choose the format promotes the comprehensive development of their multiple intelligences.

1) Linguistic-Verbal Intelligence and Interpersonal Intelligence: Practical language contexts can be created in which students collaborate with classmates to design dialogues and perform them in English assignments. To accomplish this,

students must engage in thorough communication and interaction, thus honing their oral language and interpersonal communication skills.

2) Bodily-Kinesthetic Intelligence and Visual-Spatial Intelligence: Some collaborative performance assignments require students to create props themselves, including imagining and constructing basic models of props. This involves hands-on manufacturing and practical implementation, thereby developing bodily-kinesthetic intelligence. Additionally, assignments involving drawing and design require students to grasp spatial structures, enhancing their spatial intelligence.

3) Musical-Rhythmic Intelligence: Assignments involving the creation of music songs require students to integrate simple sentences into musical rhythms. This demands the application of musical-rhythmic intelligence, utilizing imagination and reasoning to express rigid English sentences in a flexible manner.

4) Naturalistic Observation Intelligence: Creative and practical assignments require students to step outside the realm of textbooks, personally experience reality, find their roles, and imagine real-life scenarios. This requires the application of students' ordinary observational abilities in the natural and social realms.

3.3.2.3 Design of Homework Evaluation Methods

Classroom teaching integrates teachers' instruction with students' practice in an interactive manner. Similarly, homework design is a process of communication between teachers and students. After designing a homework assignment, it is completed by students. Their performance, whether good or not, needs to be evaluated by teachers. Therefore, the design of homework evaluation methods is essential. Drawing from Gardner's theory of multiple intelligences, homework evaluation needs to encompass various factors and employ diverse evaluation methods, such as peer assessment, self-assessment, and peer-to-peer assessment. This engages students in the homework evaluation process, helping them find a sense of achievement and identify gaps with peers. They receive timely feedback, understand their learning progress, and adjust their study plans accordingly, thereby stimulating intrapersonal intelligence. Intrapersonal Intelligence: Students are the owners of their homework. They need to evaluate their own work. They can categorize their assignments based on strengths and weaknesses. Additionally, parents can provide objective evaluations of students'

assignments. Students can engage in peer communication and judgment. Teachers provide encouraging assessments. This multi-tiered evaluation approach enables students to objectively analyze their own work, discover strengths through appreciation and comparison, and acknowledge weaknesses, further developing intrapersonal intelligence. Linguistic-Verbal Intelligence and Interpersonal Intelligence: In peer assessment among group members, students need to showcase their completed assignments to fellow group members. Other members provide objective evaluations. Interactions and exchanges take place among members, allowing for the exchange of assessment opinions. This effectively enhances students' linguistic-verbal intelligence and interpersonal intelligence.

By incorporating the aforementioned multiple intelligences, the experiment can design the following examples of English homework:

1) Establishment of Homework Completion Record Sheet: The homework completion record sheet can be used to track students' weekly completion of English homework. The table divides the homework content and various forms can be categorized, such as Assignment Type 1, Assignment Type 2, Assignment Type 3, and so on. Based on the assignment category, the completion record sheet also features a star-based evaluation method: three stars for highly satisfied, two stars for satisfied, and one star for average. Students can enter their earned star ratings in the table based on their completion of the homework. Besides student self-evaluation, the sheet includes parent and teacher evaluations, where they provide feedback and suggestions on students' homework completion. This requires active involvement from students, parents, and teachers in the evaluation process, emphasizing the importance of homework evaluation, cultivating good homework completion habits, and fostering the concept of constructive evaluation. Striving for positive self-evaluation, parental evaluation, and teacher evaluation motivates students to diligently complete various assignments, thereby enhancing the quality of homework completion and improving English learning outcomes. Additionally, the use of self-assessment helps exercise and develop students' intrapersonal intelligence effectively.

2) Establishment of Group Peer Assessment System

In everyday English teaching, each English teacher is typically responsible for at least three or four classes, managing nearly two hundred students. As a

result, teachers face significant challenges in correcting and evaluating assignments and find it difficult to attend to each student individually. In addition to implementing the homework completion record sheet to achieve self-evaluation by students, parental evaluations, and joint evaluations with teachers, schools also need to empower students and establish a peer assessment system within study groups. Each English study group should create an English homework peer assessment form. Under the guidance of a group leader, students engage in peer assessments within the group. Based on various assignment contents and quality of completion, each student can assign corresponding grades to other members within the group. Every weekend, based on the star ratings received by students, the best group, most improved group, etc., can be selected and awarded accordingly. This approach encourages active engagement among students within and between groups, fostering a spirit of mutual assistance, active participation, and competitive motivation. Consequently, the quality of homework completion experiences a significant improvement. Meanwhile, teachers can obtain a clear and specific understanding of the English homework completion of each student by referring to the peer assessment forms. This reduces the time and energy spent on correcting assignments, allowing teachers to allocate their time and energy to targeted homework guidance and explanations.

3) Organizing a Series of School Evaluation Activities

To further enhance the comprehensive quality education of primary and secondary school students, alleviate the pressure of their studies, and ignite their enthusiasm for learning English, the school has created a broader platform for students. The school organizes a plethora of quality extension courses, such as offering courses in fun voice dubbing, interesting English reading, and English textbook dramas. This broadens students' horizons, fully applying English expertise to real-life situations, ensuring that each student learns and applies knowledge. The implementation of quality extension courses not only provides a stage for students to showcase their individual talents but also offers more opportunities for assignment evaluation. Students showcase and evaluate themselves through diverse and colorful activities, recognizing and adjusting themselves based on classmates' evaluations. This promotes the development of self-awareness intelligence and also encourages the development of interpersonal intelligence.

3.3.3 Process

Step 1: The researchers studied the theory of elementary school English homework design and formulated questions for the pre-test, post-test, and questionnaires.

Step 2: The pre-test, post-test, and questionnaires underwent review by the researchers' mentors and other experts in the field.

Step 3: The pre-test, post-test, and questionnaires were piloted with 54 students from Class 5 of Chongqing Eighth Elementary School who were taking English courses.

Step 4: The 54 students from Class 5 of Chongqing Eighth Elementary School were assigned to complete the pre-test. The testing time was approximately one hour.

Step 5: The researchers developed a curriculum plan based on the multiple intelligences theory-guided elementary school English homework design. This curriculum plan was designed for half a semester and obtained approval from the researchers' mentors and experts in the field.

Step 6: The researchers designed post-class English homework based on the curriculum plan. Students completed elementary school English homework guided by the multiple intelligences theory. Subsequently, they were asked to complete the post-test and questionnaires. The testing time was approximately one hour.

3.3.4 Investigating the Effects of Elementary School English Homework Design Guided by the Theory of Multiple Intelligences to Enhance the Academic Performance and Foster the Development of Chinese Elementary School Students

3.3.4.1 Evaluation by Three Content Experts and Three Media Experts on the Effects of Elementary School English Homework Design Guided by the Theory of Multiple Intelligences to Enhance the Academic Performance and Foster the Development of Chinese Elementary School Students.

3.3.4.2 Evaluation of Content Quality by Content Experts for Elementary School English Homework Design Guided by the Theory of Multiple Intelligences. Content experts working in the field of English were invited to assess the appropriateness of the content used in elementary school English homework designs guided by the theory of multiple intelligences.

3.3.4.3 Evaluation of Media Quality by Media Experts for Elementary School English Homework Design Guided by the Theory of Multiple Intelligences. Media experts working in information technology, computer science, educational technology, or related fields were invited to assess the appropriateness of the media used in elementary school English homework designs guided by the theory of multiple intelligences.

3.3.5 The researchers conducted the following steps:

Step 1: The evaluation in this study was carried out based on the research hypotheses.

Part II: This part involved an open-ended questionnaire survey. Participants were asked to express their views and suggestions on enhancing elementary students' English learning levels and overall learning abilities through the application of the theory of multiple intelligences.

Step 2: Before attempting the assessment, three measurement and assessment experts working in the field of measurement, assessment, or education were asked to review the language used in the questionnaire for appropriateness. The obtained data were used to calculate the Index of Objectives' Consistency (IOC).

Content evaluation results obtained by the responsible evaluation expert showed an Index of Objectives' Consistency (IOC) value of 0.92, and these evaluation results were then submitted for further assessment by content experts. Similarly, the measurement and assessment expert's evaluation of media quality showed an Index of Objectives' Consistency (IOC) value of 0.93, and these evaluation results were subsequently submitted for further assessment by media experts. Therefore, the total average of the Index of Objectives' Consistency (IOC) should be above 0.5 to obtain acceptable data.

The evaluation criteria used to check the consistency between test objectives and items are as follows:

Value of item objective congruence index (IOC) and verbal interpretation

+1 item is considered congruent with the objectives.

0 item is considered neutral in terms of whether it was congruent with the objectives.

-1 item is considered not congruent with the objectives.

The total mean score of the Item-Objective Congruence (IOC) Index is supposed to be higher than 0.5 for acceptable data.

Step 3: The experts will utilize this assessment. Content experts will assess the quality of applying the theory of multiple intelligences in elementary school English homework design, and media experts will assess the quality of applying the theory of multiple intelligences in elementary school English homework design.

3.5.6 Verification through Analysis of Changes in Student Achievement Before and After Homework Design, Student Interviews, and Analysis of Homework Text Before and After Design Using the Method to Verify the Positive Impact of Homework Design on Elementary School Students After Applying the Theory of Multiple Intelligences, Demonstrating its Effectiveness.

3.3.7 Achievement Assessment (Pre-test and Post-test)

Both the pretest and posttest utilized the same items. Both assessments consisted of 40 questions relevant to what students had studied in their post-homework. Students underwent the pretest before completing the elementary school English homework guided by the theory of multiple intelligences, and then underwent the posttest after completing the homework. The researchers followed these steps:

Step 1: The researchers chose the type of test. A multiple-choice test was chosen for this study.

Step 2: The second part of the questionnaire was developed to measure students' achievements in elementary school English homework design guided by the theory of multiple intelligences.

Step 3: Three measurement and assessment experts working in the field of measurement, assessment, or education were asked to check the consistency between the objectives and items in the test. The obtained data were used to calculate the Index of Objectives' Consistency (IOC).

The evaluation criteria used to check the consistency between test objectives and items are as follows:

Value of item objective congruence index (IOC) and verbal interpretation of achievement assessment

+1 a test item is considered congruent with the objectives.

0 a test item is considered neutral in terms of whether it is congruent with the objectives.

-1 a test item is considered not congruent with the objectives.

The total mean score of the Item-Objective Congruence (IOC) Index is supposed to be higher than 0.5 for acceptable data.

Step 4: Both the pretest and posttest were conducted with 54 elementary school students from Class 5 of Chongqing Eighth Primary School, who were studying English. After the test attempts, the Difficulty Index, Discrimination Index, and Reliability Index of the achievement test were determined using the Kuder-Richardson formula K-R#20. The results indicated that the Difficulty Index should be between 0.2 and 0.8, the Discrimination Index should be 0.2 or higher, and the Reliability should be 0.8 or higher.

Step 5: The pretest and posttest will be used to explore the difference in the level of learning achievement in their scores after completing elementary school English homework guided by the theory of multiple intelligences.

3.3.6 Survey on Students' Satisfaction with Completing Elementary School English Homework Guided by the Theory of Multiple Intelligences.

This survey aims to understand students' learning achievements in using elementary school English homework guided by the theory of multiple intelligences to improve their English proficiency. The survey is conducted in English. The researchers followed these steps:

Step 1: The questionnaire in this study has been developed based on the research hypothesis. Therefore, it is designed based on the theory used in this study. Research indicates that using elementary school English homework guided by the theory of multiple intelligences improves English proficiency. The purpose of the questionnaire is divided into two main parts:

Part 1: The first section aims to measure students' satisfaction with the online learning platforms. This part was a close-ended questionnaire that was based on the five (5) point Likert-type scales. The participants were asked to rate their degree of agreement on each statement from numbers 1-5. The interpretation of each number is described as follows:

5 = Strongly agree

4 = Agree

3 = Undecided

2 = Disagree

1 = Strongly disagree

Table 3.1 Range of mean and verbal interpretation

Range Value	Verbal Interpretation
4.50-5.00	Strong Agree
3.50-4.49	Agree
2.50-3.49	Undecided
1.50-2.49	Disagree
1.00-1.49	Strongly disagree

Part 2: This section consists of an open-ended questionnaire. Participants are asked to express their opinions and suggestions regarding their learning achievements and satisfaction in using elementary school English homework guided by the theory of multiple intelligences to improve their English proficiency.

Step 2: Before trying out the questionnaire, three measurement and evaluation experts who work in the field of measurement and evaluation or education were asked to check the appropriateness of the language used in the questionnaire. The data obtained were used to calculate the Item Objective Congruence index (IOC).

The evaluation criteria were used for checking the congruence between objectives and items of the test as follows:

Value of item objective congruence index (IOC) and verbal interpretation of questionnaire on students' satisfaction

+1 item is considered congruent with the objectives.

0 item is considered neutral in terms of whether it was congruent with the objectives.

-1 item is considered not congruent with the objectives.

The total mean score of the Item-Objective Congruence (IOC) Index is supposed to be higher than 0.5 for acceptable data.

Step 3: Participants will utilize the questionnaire to explore their satisfaction with elementary school English homework guided by the theory of multiple intelligences. The questionnaire is applied to primary school students.

3.4 Data collection

Step 1: Provide elementary school students from Class 5 of Chongqing Eighth Primary School with elementary school English homework designs guided by the theory of multiple intelligences, aiming to enhance students' English proficiency and exam scores.

Step 2: Conduct a pretest for students to obtain scores.

Step 3: Students complete elementary school English homework guided by the theory of multiple intelligences and engage in learning activities based on this theory.

Step 4: Perform a posttest on the students and analyze the scores using statistical methods.

3.5 Data and Statistical Analysis

3.5.1 The researcher conducted the data analysis as the following procedures:

3.5.1.1 Guided by the theory of multiple intelligences, elementary school English homework was designed to enhance the English learning level and performance of elementary school students. In this regard, represents the average or mean percentage of scores obtained by students from activities and assignments (such as exercises, project assignments, etc.), and represents the average or mean percentage of scores obtained by students from posttests, final exams, and other summarizing assessments.

3.5.1.2 Dependent t-tests were applied to compare the achievement tests before and after the design of elementary school English homework guided by the theory of multiple intelligences.

3.5.1.3 Satisfaction of students with the design of elementary school English homework guided by the theory of multiple intelligences was studied through mean values and standard deviations.

3.5.2 The basic statistics in data analysis are:

3.5.2.1 The formula for calculating the arithmetic mean ( ) is

$$\bar{X} = \frac{\sum X}{N}$$

Whereas $\bar{X}$ = Average or Arithmetic Mean

$\sum X$ = Sum of all score results

N = Number of students

3.5.2.2 The formula for calculating the standard derivation (S.D.) is:

$$S.D. = \sqrt{\frac{\sum (x - \bar{x})^2}{N}}$$

Whereas $S.D.$ = Standard deviation

N = Number of students

$\bar{X}$ = Mean value

X = Student score

3.5.2.3 The formula used to determine the quality of the instruments were: In finding content validity of the achievement test, we conducted the IOC formula (Item Objectives Congruence) by following the formula below:

$$\text{IOC} = \frac{\sum R}{N}$$

Whereas IOC = Index of correspondence between the test and the objective

$\sum R$ = Sum of individual expert's value

R = Expert's rating

N = Number of experts

3.5.2.4 The formula in finding the difficulty index of the achievement Test were

$$P = \frac{R_{H+}R_L}{N_H + N_L}$$

Whereas P = difficulty level

RH = the number of people who chose the Highest option rate

RL = the number of people who chose the Lowest option rate

NH = the total number of people in the high group

NL = the total number of people in the low group

Table 3.2 Range of difficulty index and verbal interpretation

Difficulty Index	Verbal Interpretation
0.00-0.20	Very Difficult
0.21-0.40	Difficult
0.41-0.60	Average / Moderately Difficult
0.61-0.80	Easy
0.81-1.00	Very Easy

3.5.2.5 The formula for calculating the item discrimination of the achievement test is:

$$r = \frac{R_H - R_L}{N_H \text{ or } N_L}$$

Whereas r = Discrimination index

R_H = Number of correct responses in the high group

R_L = Number of correct responses in the low group

N_H = Total number of students in the high group

N_L = Total number of students in the low group

Table 3.3 Range of discrimination index and verbal interpretation

Discrimination Index	Verbal Interpretation
0.40 and above	Very Discriminating / Very Good Item
0.30 to 0.39	Discriminating / Good Item
0.20 to 0.29	Moderately Discriminating Item
0.10 to 0.19	Not Discriminating / Marginal Item
Below 0.10	Poor / Questionable Item

3.5.2.6 The formula for calculating the reliability of the achievement test K-R#20 by Kuder-Richardson is:

$$\text{rtt} = \frac{k}{S^2}\left[1 - \frac{\sum pq}{\ }\right]$$

Whereas rtt = Reliability index

K = Number of test items

p = The proportion of the correct answer

q = The proportion of the incorrect answer

S_2 = The variation of the entire test

3.5.2.7 The formula for calculating the variability of the achievement test is:

$$S^2 \quad \frac{n\sum fx^2 - \left(\sum fx^2\right)}{n(n-1)}$$

Whereas S^2 = Variance

n = Number of students

x = Achievement test score

f = Data of frequency

3.5.2.8 The formula used to verify the hypothesis were: The formula used in analyzing the differences in achievement scores using the dependent t-test was:

$$t = \frac{\sum D}{\sqrt{\frac{n\sum D^2 - \left(\sum D\right)}{n-1}}}$$

Whereas $\sum D$ = Sum of variance score of achievement test

$\sum D^2$ = Sum of different squares of achievement test scores

$(\sum D)^2$ = Sum of variance score of achievement test

n = Number of students

D = Difference between pre-test and post-test

3.5.2.9 The formula for calculating the efficiency values of E1/E2 = 80/80 are as follows:

$$E1 = \frac{X_1}{A_1} \times 100$$

Whereas E1 = Efficiency of the process

X_1 = Average score all students earned from the test

A_1 = Full scores of formative evaluations such as Scores from activities, and assignments

$$E2 = \frac{X_2}{A_2} \times 100$$

Whereas E2 = Efficiency of the product

X_2 = Average score all students earned from the test

A_2 = Full scores of summative evaluations such as scores from post-test or final works assigned to the students

CHAPTER 4
RESEARCH RESULT

This chapter reports descriptive analysis the effect of using the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China. The findings are presented as follows:

4.1 Descriptive Data Statistic

4.2 Analysis Results

4.1 Descriptive Data Statistic

4.1.1 Study the efficiency of using the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China.

4.1.2 Compare the learning achievement of students between pre-test and post-test scores using the theory of multiple intelligences in the design of elementary school English homework by t-test.

4.1.3 Study the satisfaction of students who using the theory of multiple intelligences in the design of elementary school English homework by mean and standard deviation.

4.2 Analysis Results

4.2.1 Study the efficiency of using the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China.

4.2.1.1 The theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China.

Table 4.1 Results of evaluation efficiency of the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China

Items	n	$\bar{X}$	Percentage	Standard	E1/E2
Ongoing score	100	86.10	86.10	80	83.27
Post-test score	20	16.22	81.10	80	82.00

From Table 4.1, the data clearly shows that the average score for ongoing assessments is 83.27, while the average score for post-assessments is 82.00. This indicates a substantial improvement achieved through the integration of the theory of multiple intelligences into the design of elementary school English homework. This positive change has led to a favorable impact on Chinese elementary school students. In summary, the incorporation of the theory of multiple intelligences in the design of elementary school English homework is in accordance with the developmental criteria outlined by the standard definition.

4.2.1.2 Evaluation of the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China from three content experts.

The 10 items of evaluation consist of the form issued by three content experts. A 5-point rating scale is utilized in this section to represent the content experts' opinion. Each criterion rating is identified as illustrated in Table below.

Table 4.2 Results of evaluation of the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China by three content experts

Evaluation Items	$\bar{X}$	S.D.	Result Interpretation
1. English assignments should align with the intended learning objectives and curriculum goals, ensuring that students can achieve the expected levels of knowledge and skills during the learning process.	5.00	0.00	Excellent
2. English assignments should be designed to be attractive and engaging, aiming to stimulate students' interests and encourage their active participation in learning.	5.00	0.00	Excellent
3. English assignments and the designed activities should be adjusted based on elementary students' age, cognitive abilities, and interests, ensuring that the assignments are meaningful and understandable to them.	4.67	0.57	Excellent
4. The quantity of English assignments should be moderate, neither excessive nor too little, in order to maintain students' focus and engagement.	4.67	0.57	Excellent
5. English assignments should be organized in a logical sequence, ensuring that students can understand the developmental progression of knowledge.	4.67	0.57	Excellent
6. English assignments should be accurate and free from errors or misleading information, guaranteeing that students acquire correct knowledge.	5.00	0.00	Excellent

Table 4.2 Results of evaluation of the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China by three content experts (Cont.)

Evaluation Items	$\bar{X}$	S.D.	Result Interpretation
5. English assignments should be organized in a logical sequence, ensuring that students can understand the developmental progression of knowledge.	4.67	0.57	Excellent
6. English assignments should be accurate and free from errors or misleading information, guaranteeing that students acquire correct knowledge.	5.00	0.00	Excellent
7. The language used in English assignments should be suitable for elementary students' language comprehension and communication levels, avoiding overly complex or difficult vocabulary and sentence structures.	5.00	0.00	Excellent
8. English assignments should be consistent with the teaching activities, assisting students in better understanding and applying the learned knowledge.	5.00	0.00	Excellent
9. English assignments can incorporate various forms of instructional demonstrations, such as images, videos, interactive activities, etc., to capture students' attention and ignite their interest in learning.	4.67	0.57	Excellent

Table 4.2 Results of evaluation of the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China by three content experts (Cont.)

Evaluation Items	$\bar{X}$	S.D.	Result Interpretation
10. English assignments should include summaries or conclusions, helping students review the learned knowledge and gain a clear understanding of the entire teaching process.	5.00	0.00	Excellent
Total	4.87	0.23	Excellent

Analyzing Table 4.2, the outcomes of the assessment on content quality concerning the application of the theory of multiple intelligences in the design of elementary school English homework and its beneficial impact on Chinese elementary school students were evaluated by three content experts. The overall quality received an excellent rating ($\bar{X}$ = 4.87, S.D. = 0.23). When scrutinizing individual elements, it became evident that factors such as the alignment of content with learning objectives, the intriguing nature of the content, content accuracy, appropriateness of language for learners, congruence of activities with content, and the comprehensiveness of content overview, all scored at an excellent level ($\bar{X}$ = 5.00, S.D. = 0.00), respectively.

4.2.1.3 Evaluation of the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China from three media experts.

The 10 items of evaluation consist of the form issued by three media experts. A 5-point rating scale is utilized in this section to represent the media experts' opinion. Each criterion rating is identified as illustrated in Table below.

Table 4.3 Results of evaluation of the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China by three media expert

Evaluation Items	$\bar{X}$	S.D.	Result Interpretation
1. Applying the theory of multiple intelligences to assignment design ensures the coverage of various learning styles and abilities, making it easier for elementary students to understand and complete assignments.	4.67	0.57	Excellent
2. The sequence of activities and the arrangement of English assignments are logical and coherent, guiding students to progressively understand and master knowledge.	4.33	0.57	Good
3. The instructions and requirements of assignments are expressed in simple and clear language, avoiding the use of complex and difficult vocabulary. This ensures that elementary students can understand the assignment's requirements and begin execution.	4.67	0.57	Excellent
4. Images are consistent with the instructional content, assisting students in better comprehending questions or concepts. Images serve as auxiliary tools, providing more intuitive information.	4.33	0.57	Good

Table 4.3 Results of evaluation of the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China by three media expert (Cont.)

Evaluation Items	$\bar{X}$	S.D.	Result Interpretation
5. The language of the assignments is vivid and imagery-rich, allowing students to intuitively grasp the meaning of the questions.	4.33	0.57	Good
6. The difficulty and nature of assignment activities suit the cognitive level and developmental stage of elementary students' abilities.	4.00	0.00	Good
7. English assignments are full of interest, capable of arousing students' curiosity and enthusiasm.	4.33	0.57	Good
8. The design of assignments encourages active student participation, fostering their interest and enthusiasm for learning.	4.33	0.57	Good
9. The design of assignments helps students to gain a deeper understanding of the English curriculum.	4.33	0.57	Good
10. Assignments provide clear details and guidance, helping students understand how to execute assignments, and preventing confusion or misunderstanding.	4.67	0.57	Excellent
Total	4.40	0.57	Good

Looking at Table 4.3, it's quite clear that the evaluation conducted by three media experts demonstrates the media quality assessment pertaining to the application of the theory of multiple intelligences in the design of elementary school

English homework and its positive impact on Chinese elementary school students. The overall quality garnered a favorable rating ($\bar{X}$ = 4.40, S.D. = 0.57). Upon careful examination of each aspect, it becomes evident that English homework crafted under the guidance of the theory of multiple intelligences is distinguished by its ease of comprehension, user-friendliness, straightforwardness, and presentation of lucid and comprehensible details. All these specific criteria achieved an outstanding level of rating ($\bar{X}$ = 4.67, S.D. = 0.57).

4.2.3 Compare the learning achievement of students between pre-test and post-test scores using the theory of multiple intelligences in the design of elementary school English homework.

By completing the tests, students were able to learn English through the theory of multiple intelligences in the design of elementary school English homework, and conduct Post-test, which was consistent with objective 2, illustrating the results of analysis as shown in Table 4.4

Table 4.4 Comparison of average score before and after of the students using the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China

Items	n	$\bar{X}$	S.D.	df	t-test	Sig. (2-tailed)
Pre-test	30	12.41	1.88	29	10.08	.000
Post-test	30	16.20	2.10			

**p< .05

From Table 4.4, the effectiveness of the theory of multiple intelligences in the design of elementary school English homework and its positive impact on Chinese elementary school students is showcased. The average score of pre-tests was 12.41, with a standard deviation (S.D.) of 1.88. Following the utilization of the theory of multiple intelligences in the design of elementary school English homework to enhance learning outcomes, a substantial enhancement was observed in student performance, resulting in a post-test score of 16.20, accompanied by a standard deviation (S.D.) of 2.10. Additionally, the t-test analysis conducted before and after the treatment yielded a value of 10.08, signifying a significant difference that was statistically noteworthy at the .05 significance level.

4.2.4 Study the satisfaction of students who using the theory of multiple intelligences in the design of elementary school English homework.

Evaluation of students' satisfaction questionnaire on learned with the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China.

Table 4.5 Result of evaluation of students' satisfaction with the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China

Evaluation Items	$\bar{X}$	S.D.	Result Interpretation
1. English homework design guided by the theory of multiple intelligences is fun.	4.50	0.51	Strongly Agree
2. English homework design guided by the theory of multiple intelligences creates a good atmosphere in the classroom.	4.60	0.50	Strongly Agree
3. English homework design guided by the theory of multiple intelligences provides you with more chances to participate in learning.	4.50	0.51	Strongly Agree
4. English homework design guided by the theory of multiple intelligences help you memorize more words.	4.47	0.51	Agree
5. English homework design guided by the theory of multiple intelligences helps you spell words correctly.	4.53	0.51	Strongly Agree
6. English homework design guided by the theory of multiple intelligences provides you with a chance to practice using words you have learned.	4.50	0.51	Strongly Agree

Table 4.5 Result of evaluation of students' satisfaction with the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China (Cont.)

Evaluation Items	$\bar{X}$	S.D.	Result Interpretation
7. English homework design guided by the theory of multiple intelligences makes you feel more enthusiastic about vocabulary learning.	4.53	0.51	Strongly Agree
8. English homework design guided by the theory of multiple intelligences develops your creativity.	4.67	0.48	Strongly Agree
9. English homework design guided by the theory of multiple intelligences develops your English proficiency.	4.43	0.50	Agree
10. English homework design guided by the theory of multiple intelligences improves your reading fluency.	4.57	0.50	Strongly Agree
Total	4.53	0.50	Strongly Agree

Examining Table 4.5, it's evident that the assessments of 54 students reflect a distinct satisfaction with the application of the theory of multiple intelligences in the design of elementary school English homework and its positive impact on Chinese elementary school students. On the whole, student satisfaction levels showed a strong consensus ($\bar{X}$ = 4.53, S.D. = 0.50). Delving into each facet, it's clear that the integration of the theory of multiple intelligences in the design of elementary school English homework significantly fosters creativity, receiving a robust consensus rating ($\bar{X}$ = 4.67, S.D. = 0.48). Likewise, the implementation of the theory of multiple intelligences in cultivating a positive classroom environment also garnered a robust consensus rating ($\bar{X}$ = 4.60, S.D. = 0.50).

CHAPTER 5
CONCLUSION AND DISCUSSION

In the study examining the effect of utilizing the theory of multiple intelligences in the design of elementary school English homework and its positive impact on Chinese elementary school students, there are three major objectives 1).to investigate the effectiveness of employing the theory of multiple intelligences in the design of elementary school English homework and its resulting positive impact on Chinese elementary school students 2)compare the learning achievements of students through pre-test and post-test scores when the theory of multiple intelligences is applied in the design of elementary school English homework and 3)explore the satisfaction levels of students who engage with the theory of multiple intelligences in the design of elementary school English homework. The study's sample comprised 54 fourth-grade students from Chongqing Eighth Primary School in China during the 2020-2021 academic year. These students were selected using purposive sampling. The research instruments consisted of (1) the application of the theory of multiple intelligences in the design of elementary school English homework and its positive impact on Chinese elementary school students (2) questionnaires assessing content and media quality related to the theory of multiple intelligences in the design of elementary school English homework and its positive impact on Chinese elementary school students (3) learning achievement questionnaires capturing the variance between pre-test and post-test scores when employing the theory of multiple intelligences in the design of elementary school English homework (4) satisfaction questionnaires designed to gauge students' satisfaction levels with the theory of multiple intelligences in the design of elementary school English homework. In conclusion, the ensuing discussion and suggestions derived from the research findings are as follows:

5.1 Discussion

5.2 Conclusion

5.3 Recommendation

5.4 Suggestion

5.1 Discussion

The discussion of the study on the effect of using the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China is as follows:

5.1.1 Study the efficiency of using the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China.

5.1.1.1 Results of evaluation efficiency of the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China.

The average mean score of ongoing score was 83.27, and the mean score of post-tests was 82.00, which indicated a substantial improvement upon the the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China. The result revealed that the value of efficiency of E1/E2 as 83.27/82.00. To summarize, this online learning based on the the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China is developed according to the standard criteria 80/80 defined because there is a process for finding the effectiveness of lessons that are consistent with the research process that is accurate and clear. The results of this experiment are consistent with the research results of Suchat Phetthianchai (2021) conducted the development of football learning application for Muban Chombueng Rajabhat University student, and the result showed that the efficiency of football learning application was 82. 90/ 90. 83, consistent with the research results of Arporn Maneenin (2016) conducted of the development of mobile application in Mathematics for Computer subject about base number system for second year students of vocational certificate majoring in Business Computer and the result showed that the mobile application in Mathematics for computer subject about Base Number System for second year students of vocational certificate majoring in Business Computer met the efficiency criteria at 81.77/85.11 level.

5.1.1.2 Results of evaluation of the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China by three content experts and three media experts. The results of the content quality assessment of the the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China evaluated by three content experts. The overall quality was excellent level ($\bar{X}$ = 4.87, S.D. = 0.23). When considering each item, it was found that consistency between content and learning objectives, the content is interesting, content accuracy, the language used in the content is appropriate for the learners, activities are consistent with the content and the overview of the content is complete were excellent level ($\bar{X}$ = 5.00, S.D. = 0.00), respectively. The results of the media quality assessment of the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China evaluated by three media experts. The overall quality was good level ($\bar{X}$ = 4.40, S.D. = 0.57). When considering each item, it was found that learning through artificial intelligence is easy to understand, easy to use, uncomplicated and the details are clear and easy to understand were excellent level ($\bar{X}$ = 4.67, S.D. = 0.57), respectively. This may be due to the quality assessment process of the theory of multiple intelligences in the design of elementary school English homework. There are the correct procedures and processes in a systematic manner through quality assessment from experts with real specific knowledge. The results of this experiment are consistent with the research results of Suebwong Chuensombat (2021) conducted the report on using web application based on mobile learning instructional model using brain- based learning and phonics method to enhance English vocabulary pronunciation skill, and the result showed that the web application exceled in the area of media design ($\bar{X}$ = 4.57, S.D. = 0.54) and content ($\bar{X}$ = 4.82, S.D. = 0.39). The efficiency of web application based on BBLP model was 69.08% which corresponding with criteria.

5.1.2 Compare the learning achievement of students between pre-test and post-test scores using the theory of multiple intelligences in the design of elementary school English homework.

The efficiency of the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China. The mean score of pre-tests was 12.41, and the score of standard deviation (S.D.) was 1.88. The result after using the the theory of multiple intelligences in the design of elementary school English homework to enhance learning achievement constituted a substantial improvement in students which translated into a high post-test 16.20 and standard deviation (S.D.) 2.10 and t-test analysis before and after the treatment 10.08 which demonstrated a considerable difference was statistically significant at the .05 level. This may be due to the theory of multiple intelligences in the design of elementary school English homework that enable participants to learn at their own pace and help learning achievement goals. The results of this experiment are consistent with the research results of Pawarit Pingmuang (2021) conducted a study of effect of mobile-assisted language learning application using task- based approach and gamification to enhance junior high school student's English writing skills, and the result showed the experiment result indicated that the samples had English writing skills in the post-test was higher than the pre-test at the .05 level of significance, consistent with the research results of Songsri Chamnanij (2021) conducted the use of game applications for measurement and evaluation in the 21st Century to improve learning achievement in the research for learning development course of bachelor of Education students, and the result showed that students who used QUZIZZ as the learning activities had higher learning achievements in the research for learning development course than students who used KAHOOT as the learning activities significant at .01 level, consistent with the research results of Chat Chuchuen (2019) conducted the learning outcome of English subject by lesson one for kids application using augmented reality technology, and the result showed it was found that learning by Lesson One could increase the potential in English vocabulary memorizing among the students at the statistical significance level of . 05, consistent with the research results of Suebwong Chuensombat (2021) conducted the report on using web application based on mobile learning instructional model using brain-based learning and phonics method to enhance English Vocabulary pronunciation skill, and the result showed result of using the web application learners' English pronunciation score improved at the significant level of .05, consistent with the research

results of Rungroj Srijunkaew (2023) conducted the results of using Kahoot application on knowledge in cognitive domain the basics of trigonometric ratios of students in Grade 9, and the result showed the level of satisfaction scores of Grade 9 Students who were given the activity to develop their knowledge of the cognitive domain in basics trigonometric ratios using the Kahoot application were at a high.

5.1.3 Study the satisfaction of students who using the theory of multiple intelligences in the design of elementary school English homework.

The results of evaluation of students' satisfaction with the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China by 54 students. The overall students' satisfaction was strongly agree level ($\bar{X}$ = 4.53, S.D. = 0.50). When considering each item, it was found that learning English through artificial intelligence develops your creativity was strongly agree level ($\bar{X}$ = 4.67, S.D. = 0.48) and learning English through artificial intelligence creates a good atmosphere in the classroom was strongly agree level ($\bar{X}$ = 4.60, S.D. = 0.50), respectively. This may be due to the content design being interesting, engaging, and helping to enhance self-learning skills. and the nature of the picture. The font size and color used in the content are beautiful, easy to read and accurate. The results of this experiment are consistent with the research results of Songsri Chamnanij (2021) conducted the use of game applications for measurement and evaluation in the 21st Century to improve learning achievement in the research for learning development course of Bachelor of Education Students, and the result showed most of the students had a positive opinions on learning activities using KAHOOT and QUIZIZZ had more positive opinions than KAHOOT.

5.2 Conclusion

The analysis result of the above information answers to the research objectives as follows:

5.2.1 Study the efficiency of using the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China.

5.2.1.1 Results of evaluation efficiency of the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China.

The average mean score of ongoing score was 83.27, and the mean score of post-tests was 82.00, which indicated a substantial improvement upon the theory of multiple intelligences in the design of elementary school English homework to enhance learning achievement of secondary students, China. The result revealed that the value of efficiency of E1/E2 as 83.27/82.00. To summarize, this online learning based on the the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China is developed according to the standard criteria 80/80 defined.

5.2.1.2 Results of evaluation of the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China by three content experts.

The results of the content quality assessment of the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China evaluated by three content experts. The overall quality was excellent level ($\bar{X}$ = 4.87, S.D. = 0.23). When considering each item, it was found that consistency between content and learning objectives, the content is interesting, content accuracy, the language used in the content is appropriate for the learners, activities are consistent with the content and the overview of the content is complete were excellent level ($\bar{X}$ = 5.00, S.D. = 0.00), respectively.

5.2.1.3 Results of evaluation of the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China by three media experts.

The results of the media quality assessment of the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China evaluated by three media experts. The overall quality was good level ($\bar{X}$ = 4.40, S.D. = 0.57). When considering each item, it was found that learning through artificial intelligence is easy to understand, easy to use, uncomplicated and the details are clear and easy to understand were

excellent level ($\bar{X}$ = 4.67, S.D. = 0.57), respectively.

5.2.2 Compare the learning achievement of students between pre-test and post-test scores using the theory of multiple intelligences in the design of elementary school English homework.

The efficiency of the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China. The mean score of pre-tests was 12.41, and the score of standard deviation (S.D.) was 1.88. The result after using the theory of multiple intelligences in the design of elementary school English homework to enhance learning achievement constituted a substantial improvement in students which translated into a high post-test 16.20 and standard deviation (S.D.) 2.10 and t-test analysis before and after the treatment 10.08 which demonstrated a considerable difference was statistically significant at the .05 level.

5.2.3 Study the satisfaction of students who using the theory of multiple intelligences in the design of elementary school English homework.

The results of evaluation of students' satisfaction with the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China by 54 students. The overall students' satisfaction was strongly agree level ($\bar{X}$ = 4.53, S.D. = 0.50). When considering each item, it was found that learning English through artificial intelligence develops your creativity was strongly agree level ($\bar{X}$ = 4.67, S.D. = 0.48) and learning English through artificial intelligence creates a good atmosphere in the classroom was strongly agree level ($\bar{X}$ = 4.60, S.D. = 0.50), respectively.

5.3 Recommendation

In this research, researcher have suggested that the results of the study should be applied as follows:

5.3.1 By employing the theory of multiple intelligences to guide the design of elementary school English homework, it can effectively enhance students' English performance while promoting their comprehensive development across various

intelligences. This serves as a robust reference and guidance for educators to incorporate the theory of multiple intelligences into future homework design.

5.3.2 It is recommended to extend the application of multiple intelligences theory within homework design, closely intertwining it with the design process. This approach can further cultivate students' multiple intelligences, leading to improved learning outcomes.

5.3.3 Consideration should be given to introducing elements of engagement and openness in homework design, creating more opportunities for practical involvement. This approach helps stimulate students' interest in learning, making them more willing to complete their assignments and derive enjoyment from them.

5.3.4 Emphasize the importance of amalgamating multiple intelligences theory with homework, highlighting its role not only in fostering students' growth but also in positively influencing the development of future educational theories.

5.4 Suggestion for Further Study

Based on the summary and discussion of the study, the researcher has several suggestions for further study as follows:

5.4.1 It is recommended to introduce various educational theories into homework design to ignite broader student interest in learning. This holistic approach can enhance student engagement and consequently improve learning outcomes.

5.4.2 Beyond homework design, the application of multiple intelligences theory can be extended to other aspects of school education. By integrating the theory into teaching design, a more comprehensive cultivation of students' diverse intelligences can occur, facilitating their overall development.

5.4.3 Future research can delve deeper into the application of multiple intelligences theory. This may involve capitalizing on students' existing intelligence strengths, addressing potential intelligence weaknesses, emphasizing the development of comprehensive abilities, and nurturing innovative thinking and practical skills. Through these efforts, the overall enhancement and holistic growth of students can be propelled.

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APPENDIX A

- List of experts to experts to examine research instruments

- Invitation letter to experts to examine research instruments

Invitation letter to experts to examine research instruments

Content Experts

1. Associate Professor: Mr Zhang Zhiyong
   College of teacher education, Minzu University of China
2. Lecturer: Ms. Zhao Xiaoxiao
   Department of English, Beijing Foreign Studies University
3. Associate Professor: Ms Duan Rui Yin
   Education Department, Sichuan Normal University

Media Experts

1. Associate Professor Dr. Yang Jing
   Hangzhou Judicial Bureau, Zhejiang Province
2. Master Li Xiang
   Faculty of Technical Education, University of Toronto
3. Master Li Zhaoyao
   Beijing Guy Technology Company

Assessment Experts

1. Master Yang Haiyi
   Chongqing Sun Medical
2. Master Fan Yang
   Chongqing Children's Hospital
3. Master Zhang Xue
   Chongqing Industrial Technology School

MHESI 1962.29/2023

Office of the Dean, Faculty of Technical Education
Rajamangala University of Technology Thanyaburi
Klong Luang, Pathum Thani 12110 Thailand
Tel:+66-2-549-4710 Fax:+66-2-577-5049

18 August 2023

Dear Mr. Zhang Zhiyong
Law Teacher, Central University for Nationalities

Subject: Respectfully requesting for letter of invitation of experts for M.Ed.Thesis

I am writing to request your assistance as an honorary external research reviewer in evaluating the research instruments of Mr.Wang Yiyu, Master of Education Program in Learning Technology and Innovation Rajamangala University of Technology Thanyaburi, who has been working on the thesis titled "Utilize the guidance of the theory of multiple intelligences to design elementary school English homework". under the supervision of Assistant Professor Dr. Tiamyod Pasawano. In this regard, I would like to request your valuable time to evaluate the research instruments as I strongly believe that your expertise will be of great value in improving the research instruments.

If you have any questions or need further information, please feel free to contact Mr.Wang Yi yu, on the e-mail: wang_yi@mail.rmutt.ac.th

Yours sincerely,

(Assistant Professor Arnon Niyomphol)
Dean of Faculty of Technical Education

MHESI 1962.30/2023

Office of the Dean, Faculty of Technical Education
Rajamangala University of Technology Thanyaburi
Klong Luang, Pathum Thani 12110 Thailand
Tel:+66-2-549-4710 Fax:+66-2-577-5049

18 August, 2023

Dear Ms. Zhao Xiaoxiao
Staff, Beijing Giant Technology Company

Subject: Respectfully requesting for letter of invitation of experts for M.Ed.Thesis

I am writing to request your assistance as an honorary external research reviewer in evaluating the research instruments of Mr.Wang Yiyu, Master of Education Program in Learning Technology and Innovation Rajamangala University of Technology Thanyaburi, who has been working on the thesis titled "Utilize the guidance of the theory of multiple intelligences to design elementary school English homework". under the supervision of Assistant Professor Dr. Tiamyod Pasawano. In this regard, I would like to request your valuable time to evaluate the research instruments as I strongly believe that your expertise will be of great value in improving the research instruments.

If you have any questions or need further information, please feel free to contact Mr.Wang Yi yu, on the e-mail: wang_yi@mail.rmutt.ac.th

Yours sincerely,

(Assistant Professor Amon Niyomphol)
Dean of Faculty of Technical Education

MHESI 1962.31/2023

Office of the Dean, Faculty of Technical Education
Rajamangala University of Technology Thanyaburi
Klong Luang, Pathum Thani 12110 Thailand
Tel:+66-2-549-4710 Fax:+66-2-577-5049

18 August, 2023

Dear Ms. Duan Rui Yin
English Teacher, Sichuan Normal University

Subject: Respectfully requesting for letter of invitation of experts for M.Ed.Thesis

I am writing to request your assistance as an honorary external research reviewer in evaluating the research instruments of Mr.Wang Yiyu, Master of Education Program in Learning Technology and Innovation Rajamangala University of Technology Thanyaburi, who has been working on the thesis titled "Utilize the guidance of the theory of multiple intelligences to design elementary school English homework", under the supervision of Assistant Professor Dr. Tiamyod Pasawano. In this regard, I would like to request your valuable time to evaluate the research instruments as I strongly believe that your expertise will be of great value in improving the research instruments.

If you have any questions or need further information, please feel free to contact Mr.Wang Yi yu, on the e-mail: wang_yi@mail.rmutt.ac.th

Yours sincerely,

(Assistant Professor Arnon Niyomphol)
Dean of Faculty of Technical Education

MHESI 1962.32/2023

Office of the Dean, Faculty of Technical Education
Rajamangala University of Technology Thanyaburi
Klong Luang, Pathum Thani 12110 Thailand
Tel:+66-2-549-4710 Fax:+66-2-577-5049

18 August, 2023

Dear Asst.Prof.Dr. Yang Jing

Subject: Respectfully requesting for letter of invitation of experts for M.Ed.Thesis

I am writing to request your assistance as an honorary external research reviewer in evaluating the research instruments of Mr.Wang Yiyu, Master of Education Program in Learning Technology and Innovation Rajamangala University of Technology Thanyaburi, who has been working on the thesis titled "Utilize the guidance of the theory of multiple intelligences to design elementary school English homework". under the supervision of Assistant Professor Dr. Tiamyod Pasawano. In this regard, I would like to request your valuable time to evaluate the research instruments as I strongly believe that your expertise will be of great value in improving the research instruments

If you have any questions or need further information, please feel free to contact Mr.Wang Yi yu, on the e-mail: wang_yi@mail.rmutt.ac.th

Yours sincerely,

(Assistant Professor Arnon Niyomphol)
Dean of Faculty of Technical Education

MHESI 1962.33/2023

Office of the Dean, Faculty of Technical Education
Rajamangala University of Technology Thanyaburi
Klong Luang, Pathum Thani 12110 Thailand
Tel:+66-2-549-4710 Fax:+66-2-577-5049

18 August, 2023

Dear Asst.Prof. Li Xiang

Subject: Respectfully requesting for letter of invitation of experts for M.Ed.Thesis

I am writing to request your assistance as an honorary external research reviewer in evaluating the research instruments of Mr.Wang Yiyu, Master of Education Program in Learning Technology and Innovation Rajamangala University of Technology Thanyaburi, who has been working on the thesis titled "Utilize the guidance of the theory of multiple intelligences to design elementary school English homework". under the supervision of Assistant Professor Dr. Tiamyod Pasawano. In this regard, I would like to request your valuable time to evaluate the research instruments as I strongly believe that your expertise will be of great value in improving the research instruments.

If you have any questions or need further information, please feel free to contact Mr.Wang Yi yu, on the e-mail: wang_yi@mail.rmutt.ac.th

Yours sincerely,

(Assistant Professor Arnon Niyomphol)
Dean of Faculty of Technical Education

MHESI 1962.35/2023

Office of the Dean, Faculty of Technical Education
Rajamangala University of Technology Thanyaburi
Klong Luang, Pathum Thani 12110 Thailand
Tel:+66-2-549-4710 Fax:+66-2-577-5049

18 August, 2023

Dear Mr. Yang Haiyi
Senior Consultant, Chongqing Sun Medical

Subject: Respectfully requesting for letter of invitation of experts for M.Ed.Thesis

I am writing to request your assistance as an honorary external research reviewer in evaluating the research instruments of Mr.Wang Yiyu, Master of Education Program in Learning Technology and Innovation Rajamangala University of Technology Thanyaburi, who has been working on the thesis titled "Utilize the guidance of the theory of multiple intelligences to design elementary school English homework". under the supervision of Assistant Professor Dr. Tiamyod Pasawano. In this regard, I would like to request your valuable time to evaluate the research instruments as I strongly believe that your expertise will be of great value in improving the research instruments.

If you have any questions or need further information, please feel free to contact Mr.Wang Yi yu, on the e-mail: wang_yi@mail.rmutt.ac.th

Yours sincerely,

(Assistant Professor Arnon Niyomphol)
Dean of Faculty of Technical Education

MHESI 1962.36/2023

Office of the Dean, Faculty of Technical Education
Rajamangala University of Technology Thanyaburi
Klong Luang, Pathum Thani 12110 Thailand
Tel:+66-2-549-4710 Fax:+66-2-577-5049

18 August, 2023

Dear Ms. Fan Yang
Foreign Language Teacher, Chongqing Children's School

Subject: Respectfully requesting for letter of invitation of experts for M.Ed.Thesis

I am writing to request your assistance as an honorary external research reviewer in evaluating the research instruments of Mr.Wang Yiyu, Master of Education Program in Learning Technology and Innovation Rajamangala University of Technology Thanyaburi, who has been working on the thesis titled "Utilize the guidance of the theory of multiple intelligences to design elementary school English homework", under the supervision of Assistant Professor Dr. Tiamyod Pasawano. In this regard, I would like to request your valuable time to evaluate the research instruments as I strongly believe that your expertise will be of great value in improving the research instruments.

If you have any questions or need further information, please feel free to contact Mr.Wang Yi yu, on the e-mail: wang_yi@mail.rmutt.ac.th

Yours sincerely,

(Assistant Professor Arnon Niyomphol)
Dean of Faculty of Technical Education

MHESI 1962.37/2023

Office of the Dean, Faculty of Technical Education
Rajamangala University of Technology Thanyaburi
Klong Luang, Pathum Thani 12110 Thailand
Tel:+66-2-549-4710 Fax:+66-2-577-5049

18 August, 2023

Dear Mr. Zhang Xue
Foreign English Teacher, Chongqing Industrial Technology School

Subject: Respectfully requesting for letter of invitation of experts for M.Ed.Thesis

I am writing to request your assistance as an honorary external research reviewer in evaluating the research instruments of Mr.Wang Yiyu, Master of Education Program in Learning Technology and Innovation Rajamangala University of Technology Thanyaburi, who has been working on the thesis titled "Utilize the guidance of the theory of multiple intelligences to design elementary school English homework", under the supervision of Assistant Professor Dr. Tiamyod Pasawano. In this regard, I would like to request your valuable time to evaluate the research instruments as I strongly believe that your expertise will be of great value in improving the research instruments.

If you have any questions or need further information, please feel free to contact Mr.Wang Yi yu, on the e-mail: wang_yi@mail.rmutt.ac.th

Yours sincerely,

(Assistant Professor Amon Niyomphol)
Dean of Faculty of Technical Education

MHESI 1962.34/2023

Office of the Dean, Faculty of Technical Education
Rajamangala University of Technology Thanyaburi
Klong Luang, Pathum Thani 12110 Thailand
Tel:+66-2-549-4710 Fax:+66-2-577-5049

18 August, 2023

Dear Dr. Li Zhaoyao

Subject: Respectfully requesting for letter of invitation of experts for M.Ed.Thesis

I am writing to request your assistance as an honorary external research reviewer in evaluating the research instruments of Mr.Wang Yiyu, Master of Education Program in Learning Technology and Innovation Rajamangala University of Technology Thanyaburi, who has been working on the thesis titled "Utilize the guidance of the theory of multiple intelligences to design elementary school English homework", under the supervision of Assistant Professor Dr. Tiamyod Pasawano. In this regard, I would like to request your valuable time to evaluate the research instruments as I strongly believe that your expertise will be of great value in improving the research instruments.

If you have any questions or need further information, please feel free to contact Mr.Wang Yi yu, on the e-mail: wang_yi@mail.rmutt.ac.th

Yours sincerely,

(Assistant Professor Amon Niyomphol)
Dean of Faculty of Technical Education

APPENDIX B

- **Assessment of content quality**
- **Assessment of media quality**
- **Questionnaire of Students' Satisfaction**
- **Achievement Test**

Assessment of content quality aspects of using the guidance of the theory of multiple intelligences to design elementary school english homework

(For Content Experts)

Thesis Title	Using the Guidance of the Theory of Multiple Intelligences to Design Elementary School English Homework
Name Surname	Mr. Wang Yiyu
Program	M.Ed. (Technology and Learning Innovation)
Thesis Adviser	Assistant Professor Tiamyod Pasawano, Ed.D.

The assessment is a part of the thesis, approved by the Faculty of Technical Education, Rajamangala University of Technology Thayanburi in Partial Fulfillment of the Requirements for the master's degree.

Research of Objectives:

1. To investigate how to design elementary school English homework guided by the theory of multiple intelligences to stimulate students' enthusiasm for English learning, promote personalized development, and improve academic performance.

2. To compare students' learning achievements before and after the implementation of homework design under the guidance of the theory of multiple intelligences.

3. To examine students' satisfaction with English homework design guided by the theory of multiple intelligences.

Directions: This questionnaire is designed to examine experts' opinion toward English homework design guided by the theory of multiple intelligences. Please answer all the questions to the best of your knowledge. Your answers will be kept confidential. The questionnaire is divided into 2 parts as follows:

Part 1: Please write √ in the box that corresponds to your opinion.

Direction: Please mark √ in a box that best describes the degree of your agreement with each statement.

5 = Strongly Agree

4 = Agree

3 = Undecided

2 = Disagree

1 = Strongly Disagree

Items	Level of agreement				
	5	4	3	2	1
1. English assignments should align with the intended learning objectives and curriculum goals, ensuring that students can achieve the expected levels of knowledge and skills during the learning process					
2. English assignments should be designed to be attractive and engaging, aiming to stimulate students' interests and encourage their active participation in learning.					
3. English assignments and the designed activities should be adjusted based on elementary students' age, cognitive abilities, and interests, ensuring that the assignments are meaningful and understandable to them.					
4. The quantity of English assignments should be moderate, neither excessive nor too little, in order to maintain students' focus and engagement.					
5. English assignments should be organized in a logical sequence, ensuring that students can understand the developmental progression of knowledge.					
6. English assignments should be accurate and free from errors or misleading information, guaranteeing that students acquire correct knowledge.					
7. The language used in English assignments should be suitable for elementary students' language comprehension and communication levels, avoiding overly complex or difficult vocabulary and sentence structures.					

Items	Level of agreement				
	5	4	3	2	1
8. English assignments should be consistent with the teaching activities, assisting students in better understanding and applying the learned knowledge.					
9. English assignments can incorporate various forms of instructional demonstrations, such as images, videos, interactive activities, etc., to capture students' attention and ignite their interest in learning.					
10. English assignments should include summaries or conclusions, helping students review the learned knowledge and gain a clear understanding of the entire teaching process.					

Part 2: Additional advice

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Assessment of media quality aspects of using the guidance of the theory of multiple intelligences to design elementary school english homework

(For Media Experts)

Thesis Title	Using the Guidance of the Theory of Multiple Intelligences to Design Elementary School English Homework
Name Surname	Mr. Wang Yiyu
Program	M.Ed. (Technology and Learning Innovation)
Thesis Adviser	Assistant Professor Tiamyod Pasawano, Ed.D.

The assessment is a part of the thesis, approved by the Faculty of Technical Education, Rajamangala University of Technology Thayanburi in Partial Fulfillment of the Requirements for the master's degree.

Research of Objectives:

1. To investigate how to design elementary school English homework guided by the theory of multiple intelligences to stimulate students' enthusiasm for English learning, promote personalized development, and improve academic performance.

2. To compare students' learning achievements before and after the implementation of homework design under the guidance of the theory of multiple intelligences.

3. To examine students' satisfaction with English homework design guided by the theory of multiple intelligences.

Directions: This questionnaire is designed to examine experts' opinion toward English homework design guided by the theory of multiple intelligences. Please answer all the questions to the best of your knowledge. Your answers will be kept confidential. The questionnaire is divided into 2 parts as follows:

Part 1: Please write √ in the box that corresponds to your opinion.

Direction: Please mark √ in a box that best describes the degree of your agreement with each statement.

5 = Strongly Agree

4 = Agree

3 = Undecided

2 = Disagree

1 = Strongly Disagree

Items	Level of agreement				
	5	4	3	2	1
1. Applying the theory of multiple intelligences to assignment design ensures the coverage of various learning styles and abilities, making it easier for elementary students to understand and complete assignments.					
2. The sequence of activities and the arrangement of English assignments are logical and coherent, guiding students to progressively understand and master knowledge.					
3. The instructions and requirements of assignments are expressed in simple and clear language, avoiding the use of complex and difficult vocabulary. This ensures that elementary students can understand the assignment's requirements and begin execution					
4. Images are consistent with the instructional content, assisting students in better comprehending questions or concepts. Images serve as auxiliary tools, providing more intuitive information.					
5. The language of the assignments is vivid and imagery-rich, allowing students to intuitively grasp the meaning of the questions.					
6. The difficulty and nature of assignment activities suit the cognitive level and developmental stage of elementary students' abilities.					
7. English assignments are full of interest, capable of arousing students' curiosity and enthusiasm					

Items	Level of agreement				
	5	4	3	2	1
8. The design of assignments encourages active student participation, fostering their interest and enthusiasm for learning.					
9. The design of assignments helps students to gain a deeper understanding of the English curriculum.					
10. Assignments provide clear details and guidance, helping students understand how to execute assignments, and preventing confusion or misunderstanding.					

Part 2: Additional advice

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Questionnaire of Students' Satisfaction

Thesis Title	Using the Guidance of the Theory of Multiple Intelligences to Design Elementary School English Homework
Name Surname	Mr. Wang Yiyu
Program	M.Ed. (Technology and Learning Innovation)
Thesis Adviser	Assistant Professor Tiamyod Pasawano, Ed.D.

This questionnaire is a part of the thesis for a master's degree in Education Program in Educational Technology and Communications, Rajamangala University of Technology Thanyaburi.

Research of Objectives:

1. To investigate how to design elementary school English homework guided by the theory of multiple intelligences to stimulate students' enthusiasm for English learning, promote personalized development, and improve academic performance.

2. To compare students' learning achievements before and after the implementation of homework design under the guidance of the theory of multiple intelligences.

3. To examine students' satisfaction with English homework design guided by the theory of multiple intelligences.

Directions: This questionnaire is designed to examine experts' opinion toward English homework design guided by the theory of multiple intelligences. Please answer all the questions to the best of your knowledge. Your answers will be kept confidential. The questionnaire is divided into 2 parts as follows:

Part 1: Please write √ in the box that corresponds to your satisfaction.

Direction: Please mark √ in a box that best describes the degree of your agreement with each statement.

5 = Strongly Agree

4 = Agree

3 = Undecided

2 = Disagree

1 = Strongly Disagree

Items	Level of agreement				
	5	4	3	2	1
1. English homework design guided by the theory of multiple intelligences is fun.					
2. English homework design guided by the theory of multiple intelligences creates a good atmosphere in the classroom.					
3. English homework design guided by the theory of multiple intelligences provides student with more chances to participate in learning.					
4. English homework design guided by the theory of multiple intelligences helps student memorize more words.					
5. English homework design guided by the theory of multiple intelligences helps you spell words correctly.					
6. English homework design guided by the theory of multiple intelligences provides student with a chance to practice using words you have learned.					
7. English homework design guided by the theory of multiple intelligences makes student feel more enthusiastic about vocabulary learning.					
8. English homework design guided by the theory of multiple intelligences develops student creativity.					
9. English homework design guided by the theory of multiple intelligences develops student English proficiency.					
10. English homework design guided by the theory of multiple intelligences improves student reading fluency.					

Part 2: Additional advice

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Achievement Test

(For Measurement and Evaluation Experts)

Thesis Title	Using the Guidance of the Theory of Multiple Intelligences to Design Elementary School English Homework
Name Surname	Mr. Wang Yiyu
Program	M.Ed. (Technology and Learning Innovation)
Thesis Adviser	Assistant Professor Tiamyod Pasawano, Ed.D.

This assessment is a part of the thesis writing for a Master's degree in Education Program in Educational Technology and Communications, Rajamangala University of Technology Thanyaburi.

Research of Objectives:

1. To investigate how to design elementary school English homework guided by the theory of multiple intelligences to stimulate students' enthusiasm for English learning, promote personalized development, and improve academic performance.

2. To compare students' learning achievements before and after the implementation of homework design under the guidance of the theory of multiple intelligences.

3. To examine students' satisfaction with English homework design guided by the theory of multiple intelligences.

Directions: This questionnaire is designed to examine experts' opinion toward English homework design guided by the theory of multiple intelligences. Please answer all the questions to the best of your knowledge. Your answers will be kept confidential. The questionnaire is divided into 2 parts as follows:

Part 1: Please write √ in the box that corresponds to your satisfaction.

Direction: Please mark √ in a box that best describes the degree of your agreement with each statement.

Items	Level of Consistency		
	+1	0	-1
1. Is it going to rain? a) Yes, it is. b) No, it isn't. c) Yes, it isn't. d) No, it is.			
2. Are we going to have a meeting today? a) Yes, we are. b) No, it is. c) Yes, it is. d) No, it isn't.			
3. Are they appropriate for learners? a) Yes, they are. b) No, he isn't. c) I don't know. d) No, it isn't.			
4. Is he going to learn English through Artificial Intelligence? a) Yes, he is. b) No, he is. c) Yes, he isn't. d) No, it isn't.			
5. Is the boy to go to school tomorrow? a) No, the boy. b) Yes, he is. c) No, the boy isn't. d) Yes, he isn't.			
6. Will they go there tomorrow? a) Yes, they will. b) No, they will. c) Yes, they won't. d) No, we will.			

Items	Level of Consistency		
	+1	0	-1
7. Shall we go to there? a) Yes, we shall. b) No, we shall. c) Yes, we will. No, we won't.			
8. -___we _____again next week? -Yes, let's make it next Wednesday. a) are, to meet b) Shall, be to meet c) Will, meet d) Are, meeting			
9. As students, we _____. a) won't smoke. b) are not to smoke c) aren't smoking d) don't smoke			
10. Who do you think _____ for the failure of their marriage? a) to blame b) to be blame c) is to blame d) is to be blamed			
11. Look at these clouds. _____, a) It's going to rain. b) It's raining. c) It is to rain. d) It can rain.			
12. Neither you nor he _____to the front. a) are to be sent b) is to be sent c) have to be sent d) is to be sent			

Items	Level of Consistency		
	+1	0	-1
13. If the sun _____tomorrow, what would we do? a) were not to raise b) does not rise c) would not rise d) were not to rise			
14-We just saw John at the bookstore. -That's strange examination _____early July. a) will come b) was to come c) is coming d) is to come			
15. The final examination _____early July. a) is to be held b) is to be taken place c) is going to hold d) will be to take place			
16. A new hospital was to_____in this district, but the money wasn't collected yet. a) have been built b) be built c) built d) have built			
17. There _____a meeting tomorrow afternoon. a) will be going to b) will going to c) is going to be d) will go to be			
18. Charlie_____here next morning. a) isn't working b) doesn't working c) isn't going to working d) won't work			
19. He _____very busy this week, he_____free next week. a) will be ; is b) is ; is c) will be ; will be d) is ; will be			

Items	Level of Consistency		
	+1	0	-1
20. There _____a dolphin show in the zoo tomorrow evening. a) was b) is going to have c) will have d) is going to be			
21. They _____an English evening next Sunday. a) are having b) are going to have c) will having d) is going to have			
22. Tomorrow he _____a kite in the open air first, and then _____boating in the park. a) will fly; will go b) will fly; goes c) is going to fly; will goes d) flies; will go			
23. He _____very busy this week, he _____ free next week. a) will be; is b) is; is c) will be; will be d) is; will be			
24. your brother_____a magazine from the library? a) Are; going to borrow b) Is; going to borrow c) Will; borrows d) Are; going to borrows			
25. you _____free tomorrow? No. I _____free the day after tomorrow. a) Are; going to; will b) Are; going to be; will c) Are; going to; will be d) Are; going to be; will be			

Items	Level of Consistency		
	+1	0	-1
26. Mother _____me a nice present on my next birthday. a) will gives b) will give c) gives d) give			
27. Shall I buy a cup of tea for you? _____.（不，不要。） a) No, you won’t. b) No, you aren’t. c) No, please don’t. d) No, please.			
28. Where is the morning paper? I _____if for you at once. a) get b) am getting c) to get d) will get			
29. a concert next Saturday? a) There will be b) Will there be c) There can be d) There are			
30. If they come, we _____a meeting. a) have b) will have c) had d) would			
31. He _____her a beautiful hat on her next birthday. a) gives b) gave c) will giving d) is going to giving			

Items	Level of Consistency		
	+1	0	-1
32. He _____to us as soon as he gets there. a) writes b) has written c) will write d) wrote			
33. The train _____ at 11 a) Going to arrive b) will be arrive c) is going to d) is arriving			
34. Let's go to school， shall we? OK. we_____. a) will going b) be going to c) go d) are going			
35._open the window? a) Will you please b) Please will you c) You please d) Do you			
36. Let's go out to play football, shall we? OK. I _____. a) will coming b) be going to come c) come d) am coming			
37. It _____the year of the horse next year. a) is going to be b) is going to c) will be d) will is			
38. It _____us a long time to learn English well. a) take b) will take c) spends d) will spend			

Items	Level of Consistency		
	+1	0	-1
39. Will his parents go to see the Terra Cotta Warriors tomorrow? No, _____（不去）. a) they willn't. b) they won't. c) they aren't. d) they don't.			
40. Shall I come again tomorrow afternoon? _____（好的）. a) Yes, please b) Yes, you will. c) No, please. d) No, you won't.			

Part 2: Additional advice

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APPENDIX C

- **Result of content validity by index of item objective congruence (IOC) achievement test**
- **Result of difficulty index (p) and discriminant index (r)**
- **Result of reliability of the achievement test**
- **Result of comparison of average score before and after**

Result of content validity by index of item objective congruence (IOC) of achievement test

The quality analysis of the achievement test was to determine the content validity by using the Index of Item Objective Congruence (IOC) formula, in which 3 measurement and evaluation experts were assigned to rate each question by considering the correspondence of the questions to the objectives of the total number of tests, 20 questions for the criteria used for consideration are questions with an IOC value of 0.50 or higher are valid questions. As for questions with an IOC value of 0.50 or less, they are questions that need to be improved or eliminated. After examining the consistency of the questions with the objectives from the experts, it was found that the experts agreed on 40 questions that were consistent, with an IOC of 0.5 or higher, and the researchers selected 20 questions to be used in pretest and posttest.

Table C.1 Result of content validity by index of item objective congruence (IOC) of achievement test

Items	Score of experts			Total score of experts	Index of Item Objective Congruence
	Expert 1	Expert 2	Expert 3		
1	+1	+1	+1	3	1.00
2	0	+1	+1	2	0.67
3	+1	+1	+1	3	1.00
4	+1	0	+1	2	0.67
5	+1	0	+1	2	0.67
6	+1	+1	+1	3	1.00
7	+1	+1	+1	3	1.00
8	+1	+1	0	2	0.67
9	+1	+1	+1	3	1.00

Table C.1 Result of content validity by index of item objective congruence (IOC) of of achievement test (Cont.)

Items	Score of experts			Total score of experts	Index of Item Objective Congruence
	Expert 1	Expert 2	Expert 3		
10	+1	+1	+1	3	1.00
11	+1	+1	+1	3	1.00
12	+1	+1	+1	3	1.00
13	0	+1	+1	2	0.67
14	+1	0	+1	2	0.67
15	+1	+1	+1	3	1.00
16	+1	+1	+1	3	1.00
17	+1	0	+1	2	0.67
18	+1	+1	+1	3	1.00
19	+1	+1	+1	3	1.00
20	+1	+1	+1	3	1.00
21	+1	+1	+1	3	1.00
22	+1	+1	+1	3	1.00
23	+1	+1	+1	3	1.00
24	+1	0	+1	2	0.67
25	+1	+1	+1	3	1.00
26	+1	+1	+1	3	1.00
27	0	+1	+1	2	0.67
28	+1	+1	0	2	0.67
29	+1	+1	+1	3	1.00
30	+1	0	+1	2	0.67

Items	Score of experts			Total score of experts	Index of Item Objective Congruence
	Expert 1	Expert 2	Expert 3		
31	+1	+1	+1	3	1.00
32	+1	+1	+1	3	1.00
33	+1	+1	+1	3	1.00
34	+1	0	+1	2	0.67
35	+1	+1	+1	3	1.00
36	+1	+1	+1	3	1.00
37	0	+1	+1	2	0.67
38	+1	+1	+1	3	1.00
39	+1	+1	+1	3	1.00
40	+1	+1	+1	3	1.00

Result of difficulty index (p) and discriminant index (r)

Table C.2 Result of difficulty index (p) and discriminant index (r)

Items	Difficulty Index (p)	Discriminant Index (r)	Level of quality		Result Interpretation
			Difficulty Index (p)	Discriminant Index (r)	
1	0.80	0.27	Easy	Moderately	Available
2	0.77	0.47	Easy	Very Discriminating	Available
3	0.80	0.40	Easy	Very Discriminating	Available
4*	0.90	0.07	Very Easy	Poor	Remove
5	0.73	0.53	Easy	Very Discriminating	Available
6	0.87	0.27	Very Easy	Moderately	Available
7	0.70	0.33	Easy	Discriminating	Available
8	0.83	0.20	Very Easy	Moderately	Available
9	0.77	0.20	Easy	Moderately	Available
10	0.87	0.27	Very Easy	Moderately	Available
11*	0.90	0.07	Very Easy	Poor	Remove
12	0.73	0.40	Easy	Very Discriminating	Available
13	0.77	0.33	Easy	Discriminating	Available
14	0.70	0.47	Easy	Very Discriminating	Available
15	0.77	0.20	Easy	Moderately	Available
16	0.63	0.47	Easy	Very Discriminating	Available
17*	0.80	0.13	Easy	Not Discriminating	Remove

Table C.2 Result of difficulty index (p) and discriminant index (r) (Cont.)

Items	Difficulty Index (p)	Discriminant Index (r)	Level of quality		Result Interpretation
			Difficulty Index (p)	Discriminant Index (r)	
18	0.63	0.33	Easy	Discriminating	Available
19	0.60	0.27	Moderately	Moderately	Available
20	0.70	0.20	Easy	Moderately	Available
21	0.83	0.20	Very Easy	Moderately	Available
22*	0.83	0.07	Very Easy	Poor	Remove
23*	0.73	0.00	Easy	Poor	Remove
24	0.73	0.40	Easy	Very Discriminating	Available
25*	0.97	0.07	Very Easy	Poor	Remove
26	0.77	0.33	Easy	Discriminating	Available
27	0.83	0.33	Very Easy	Discriminating	Available
28*	0.67	0.00	Easy	Poor	Remove
29	0.73	0.27	Easy	Moderately	Available
30	0.77	0.20	Easy	Moderately	Available
31	0.83	0.20	Very Easy	Moderately	Available
32	0.60	0.27	Moderately	Moderately	Available
33	33	0.77	0.20	Easy	Moderately
34	34*	0.73	0.00	Easy	Poor
35	35	0.83	0.20	Very Easy	Moderately
36	0.70	0.20	Easy	Moderately	Available
37	0.77	0.20	Easy	Moderately	Available
38*	0.87	0.00	Very Easy	Poor	Remove
39	0.83	0.20	Very Easy	Moderately	Available
40	0.70	0.20	Easy	Moderately	Available

* Remove questions

From Table C.2, it was found that the difficulty index should be between 0.2-0.8 and the discriminant index should be 0.2 or higher. The whole test was performed using Kuder-Richardson's K-R#20 formula, 0.81, as shown in Table C.3.

The result of reliability of the achievement test

Table C.3 The result of reliability of the achievement test

Students	**Total score (X)**	**Total Score ($X^{2)}$**	**∑pq**
N = 30	$\sum X = 923$ $(\sum X)^2 = 851929$	$\sum X^2 = 29329$ $N\sum X^2 = 879870$	6.83
S^2	$S^2 = \frac{N\sum X^2 - (\sum X)^2}{N^2}$ $S^2 = \frac{30(29329) - (923)^2}{30^2}$ $S^2 = \frac{879870 - 851929}{900}$ $S^2 = 31.05$		
r_{tt}	$r_{tt} = \frac{k}{k-1}(1 - \frac{\sum pq}{S^2})$ $r_{tt} = \frac{30}{29}(1 - \frac{6.83}{31.05})$ $r_{tt} = 1.03(1 - 0.219)$ $r_{tt} = 1.03 * 0.781$ $r_{tt} = 0.81$		

The result of reliability of the achievement test is 0.81

Result of comparison of average score before and after

Table C.4 Comparison of average score before and after of 54 students

Students	Pretest score (20)	Posttest score (20)
1	10	13
2	12	14
3	12	15
4	6	11
5	10	15
6	14	16
7	11	16
8	14	15
9	13	15
10	12	15
11	11	14
12	13	16
13	14	16
14	15	17
15	10	18
16	12	19
17	12	20
18	11	15
19	14	16
20	13	14
21	12	15

Table C.4 Comparison of average score before and after of 54 students (Cont.)

Students	Pretest score (20)	Posttest score (20)
22	13	17
23	12	18
24	14	16
25	13	20
26	14	20
27	16	19
28	12	18
29	14	17
30	14	16
31	13	15
32	12	15
33	11	14
34	13	16
35	14	16
36	15	17
37	10	18
38	12	19
39	12	20
40	11	15
41	14	16
42	13	14
43	12	15

Table C.4 Comparison of average score before and after of 54 students (Cont.)

Students	Pretest score (20)	Posttest score (20)
44	13	17
45	12	18
46	14	16
47	13	20
48	14	20
49	16	19
50	12	18
51	14	17
52	14	16
53	13	15
54	12	15

Table C.5 Compare of average score before and after of the students using artificial intelligence application for individual difference in English language and the positive impact it has on elementary school students, China

Items	n	$\bar{X}$	S.D.	t-test	Sig. (2-tailed)
Pre-test	54	12.41	1.88	10.08	0.00**
Post-test	54	16.20	2.10		

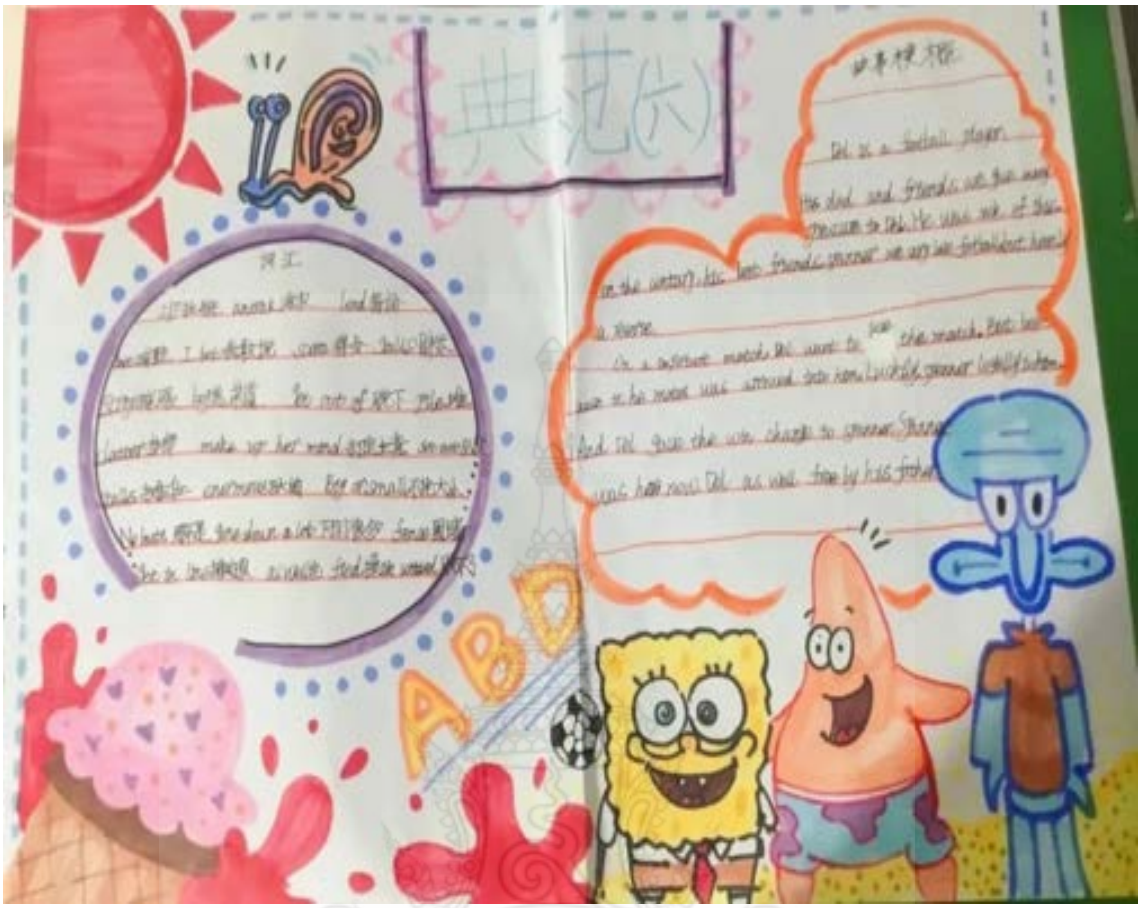
**p< .05

Table C.5 presented the effect of the theory of multiple intelligences in the design of elementary school English homework and the positive impact it has on elementary school students, China. The mean score of pre-test was 12.41, and the score of standard deviation (S.D.) was 1.88. The result after applying the theory of multiple intelligences in the design of elementary school English homework to enhance learning achievement constituted a substantial improvement in students which translated into a high post-test 16.20 and standard deviation (S.D.) 2.10 and t-test analysis before and after the treatment 10.08 which demonstrated a considerable difference was statistically significant at the .05 level.

APPENDIX D

Example of the Theory of Multiple Intelligences application


The Adventures of Tom Sawyer
Robinson Crusoe
JUNGLE SHORTS
THE MASKED CLEANING LADIES OF OM



APPENDIX

Biography

Name-Surname	Mr. Wang Yiyu
Date of Birth	July 25, 1996
Address	77 Jianxin East Road, Jiangbei District, Chongqing City.
Education	Bachelor of Law. (2018)
Experience Work	
2020 - present	teacher at Chongqing Mechanical Technology School in Chongqing City.
Telephone Number	+(86) 13883324413
E-mail	wang_yi@mail.rmutt.ac.th

วิทยานิพนธ์ฉบับนี้เป็นงานวิจัยที่เกิดจากการค้นคว้าและวิจัย ขณะที่ข้าพเจ้าศึกษาอยู่ในคณะครุศาสตร์อุตสาหกรรม มหาวิทยาลัยเทคโนโลยีราชมงคลธัญบุรี ดังนั้น งานวิจัยในวิทยานิพนธ์ฉบับนี้ถือเป็นลิขสิทธิ์ของมหาวิทยาลัยเทคโนโลยีราชมงคลธัญบุรี และข้อความต่าง ๆ ในวิทยานิพนธ์ฉบับนี้ ข้าพเจ้าขอรับรองว่าไม่มีการคัดลอกหรือนำงานวิจัยของผู้อื่นมานำเสนอในชื่อของข้าพเจ้า

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Wang Yiyu

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(Mr. Wang Yiyu)

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