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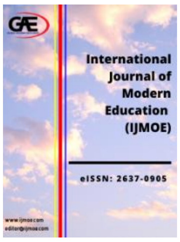

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FUZZY DELPHI METHOD (FDM) FOR DEVELOPING COMPONENTS OF THE CLASSROOM ACTIVITY-BASED INSTRUCTIONAL DESIGN (CAID) MODEL IN TEACHING CHINESE AS A FOREIGN LANGUAGE

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Abstract:

Activity-based teaching has emerged as a key strategy in advancing quality education and classroom activities play a crucial role in teaching Chinese as a foreign language (TCFL). However, the proficiency of TCFL teachers in the activity-based teaching is currently insufficient and unable to meet the demands of TCFL teaching activities. The objective of this study is to design and develop a Classroom Activity-Based Instructional Design (CAID) model that will support teachers in implementing activity-based teaching methods. Using Design and Development Research (DDR) approach, the study involved expert consensus through literature reviews and semi-structured interviews with five experts. The Fuzzy Delphi Method (FDM) was used for model validation with 19 experts, confirming that the model components met all criteria. As a result, consensus was reached on the CAID model components, which were universally accepted by experts.

Keywords:

Design And Development Research (DDR), Activity-Based Teaching, Fuzzy Delphi Method (FDM), Teaching Chinese As A Foreign Language, Expert Consensus

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Introduction And Problem Statement

Student participation is a pivotal element in activity-based teaching (Başerer, 2020). This teaching approach not only facilitates opportunities for students to connect with peers but also significantly enhances their motivation and effort (Anwer, 2019). Xun (2021) highlighted that activity-based teaching has emerged as a key strategy in advancing quality education and has become central to China's educational reforms in the 21st century. Classroom activities, in particular, play a significant role in the TCFL process (Xun, 2021). However, Ruo (2020) identified a gap, noting that the current competencies in activity-based teaching among TCFL teachers do not meet the demands of teaching activities, and that TCFL teachers face numerous challenges in implementing activity-based teaching. Scholars have identified several issues related to activity design in TCFL. For instance, Shan (2020) observed that TCFL teachers often lack an understanding of their students, resulting in activities that do not align with the students' age characteristics and knowledge levels. Ying (2021) conducted a survey revealing that 61% of teachers excessively rely on textbooks without conducting adequate analysis. Consequently, many of the communication topics and dialogues selected from textbooks are seldom connected to real-life situations (Ying, 2021). Shan (2020) also found that 90% of TCFL teachers tend to organize simple and repetitive game activities. Additionally, Samperio (2017) noted that 82% of the activities commonly used by teachers do not match students' preferences. Yang (2022) reported that only 28% of students were willing to participate in these activities. Beyond activity design, several researchers have examined the implementation of these activities. Shan (2020) found that 59.5% of TCFL teachers were unable to complete activity tasks due to inadequate classroom time management skills. Wei (2018) reported that 62% of students stated their teachers did not establish rules during classroom activities. Furthermore, Jiao (2022) mentioned that many TCFL teachers consider rearranging tables and chairs to be labor-intensive and time-consuming, leading them to conduct activities in cramped spaces, which significantly hampers their effectiveness. In addition to these concerns regarding design and implementation, some scholars have highlighted issues related to activity evaluation. Yang (2022) pointed out that 90% of teachers lack formative evaluation in activity-based teaching. They completely hand over the classroom to the students and act as "bystanders" (Yang, 2022). Additionally, Wan (2021) indicated that the effectiveness of summative testing in the classroom was inadequate. During the test preparation stage, experienced teachers were often absent to set and review questions or analyze test content validity. After testing, teachers frequently failed to analyze test data or provide timely feedback to students.

Therefore, the overarching aim of the research is to develop a CAID model to help TCFL teachers overcome the issues and facilitate TCFL teachers in conducting activity-based teaching. This study, however, is specifically focused on the development of the CAID model's components and does not encompass the development and ranking of elements within each component, nor does it address the usability evaluation of the proposed model.

Literature Review

According to the research conducted by Zafar and Akhtar in 2021, the study findings revealed that the implementation of activity-based teaching in comparison to traditional approaches resulted in significantly superior educational outcomes. Numerous scholars have conducted research on the TCFL activity-based teaching (see Table 1).

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Table 1
Summary Of The Past Related Studies Related To The TCFL Activity-Based Teaching

Author	**Research Method**	**Results**
Cong (2021)	Classroom observation	The research proposed three steps of classroom activities, namely, preparation, implementation, and summary
Shu (2022)	Literature review	The research provides some advantages and principles for classroom activities
Junhua(2021)	Classroom observation and interview	The research design some specific teaching cases of phonetics, vocabulary, and grammar
Yang (2021)	Literature review	The research classified TCFL classroom games and proposed principles for game based teaching
Dong(2020)	Survey questionnaire, and literature review	This study conducted relevant research on students' problematic behavior in TCFL classrooms, identified the reasons for students' behavioral problems, and provided relevant suggestions for teacher management
Mei (2020)	Literature review	The research elaborated the process of Chinese role-playing teaching: Introduction link; Pre-performance link; Learning link; The activity links; The evaluation link
Bing(2021)	Survey questionnaire and interview	The research proposed several teaching suggestions focused on three areas: the design, implementation, and feedback of classroom games
Qinyu (2021)	Literature review	This study analyzed the feasibility of applying virtual reality (VR) technology to TCFL classroom cultural activity teaching and conducted a case design.
Jia(2022)	Survey questionnaire and interview	The research proposed guideline for selecting teaching videos, and researchers collected and organized teaching resources available on short video platforms
Qifen (2022)	Literature review and survey questionnaire	The research elaborated the process of task-based online comprehensive Chinese language instructional design includes the following steps: introduction, new vocabulary, vocabulary practice task, grammar, grammar practice task, text introduction, text practice task, Chinese character teaching, comprehensive practice task, summary, homework assignment, and post-class testing.

The review of the TCFL activity-based teaching has highlighted a notable gap. On one hand, many scholars present principles, case studies, suggestions, and advantages of TCFL classroom activities from a broad perspective but fail to provide specific teaching steps, resulting in a lack of practical guidance. On the other hand, while some researchers do offer specific steps for classroom activities, their research methods lack expert validation and usability evaluation. Consequently, these methods may not be systematic, and the research findings may not be reliable. Richey and Klein (2014) define DDR as the systematic study of design, development,

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and evaluation processes aimed at creating instructional and non-instructional products and tools. Therefore, this study utilizes DDR to develop a CAID model to address this gap.

This study adopts constructivist theory and three basic instructional design models as the theoretical basis. Constructivism is a branch of cognitive psychology that emerged in response to the teacher-centered education prevalent in classrooms at the time. It represented a new reform in educational theory, driven by the demands of the information age (Ah-Nam & Osman, 2017). Constructivism is a cognitive and social learning theory that is crucial in education, providing a theoretical foundation for both teachers and students. It was first introduced by Piaget in the 1960s. Piaget's theory proposed a unique perspective on knowledge construction, framing the learning process as an active engagement with knowledge rather than a passive acceptance of it. He also suggested that students gradually develop their knowledge systems through interaction with their environment, continuously acquiring new knowledge and expanding their cognitive frameworks. Justification for using the constructivism theory in research is based on its emphasis on interaction. With guidance from teachers, students create meaning and develop understanding based on their existing knowledge and experiences. This process typically occurs through interaction. When teaching Chinese as a foreign language using activity-based methods, teachers can design a variety of activities to encourage students to take initiative and explore new knowledge independently. Throughout this process, teachers should focus on promoting interaction between teacher and student, as well as among the students themselves.

Various researchers also have developed instructional design models comprising different components and elements. This research synthesized and modified three such models to create the CAID model. The OTIL Model, formulated by Tian and Suppasetseree (2013), represents Online, Task-based, Interactive, and Listening. The OTIL Model prioritizes learner-centeredness and interactive learning (Tian & Suppasetseree, 2013). The rationale for choosing this model is its alignment with the principles of student focus, interaction, and the incorporation of multimedia-assisted teaching tools, which are also essential to a classroom activity-based teaching model.

The TABA Model, proposed by Taba (1962), underscores the necessity of student participation in the learning process and propels teachers to adopt diverse teaching strategies to captivate and stimulate students (Aydin et al., 2017). The model was selected because it offers flexibility in teaching, allowing educators to tailor their approaches to the needs and interests of students.

The ASIE Model stands for Analyze, Strategies, Implement, and Evaluate (Ismail & Balakrishnan, 2014). Zain and Campus (2017) suggest that the ASIE Model's distinctive attributes provide a framework that enables teachers to implement instructional design best practices and strategic planning while incorporating various elements. The model is notable for its user interactivity, integration in content planning, specificity in the planning process, and its constructive approach to organizing components (Zain & Campus, 2017). The model was chosen for its interactive, prescriptive, and constructive qualities, which are vital to the CAID Model. Table 2 presents the integration of the OTIL, TABA, and ASIE models to form the CAID Model’s components.

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Table 2
Development of CAID Model Components from Base Models

Model / Component	OTIL Model (Tian and Suppasetseree, 2013)	TABA Model (Taba ,1962)	ASIE Model (Ismai and Balakrishnan, 2014)	CAID Model	Remark on CAID Model
1	Identify Setting	Diagnosis of needs	Analysis	Analysis	It is adapted from components 1 of OTIL, TABA, and ASIE models.
2	Set Instructional Goals	Formulation of objectives	-	Set instructional objectives	It is adapted from components 2 of OTIL, 2 of TABA models.
3	Design Lessons	Selection of content Organization of content	-	Design content	It is adapted from components 3 of OTIL, 3 and 4 of TABA models.
4		Selection of learning experiences Organization of learning activities	Strategy	Design activity	It is adapted from components 3 of OTIL, 4 and 5 of TABA, 2 of ASIE models.
5	Produce Online Instructional Package	-		Develop teaching aids	It is adapted from components 4 of OTIL, 2 of ASIE models.
6	Conduct Developed lessons	-	Implement	Implement	It is adapted from components 5 of OTIL, 3 of ASIE models.
7	Evaluation	Evaluate	Evaluate	Evaluate	It is adapted from components 6 of OTIL, 7 of TABA, 4 of ASIE models.

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Methodology

This study utilized the Design and Development Research (DDR) method to design and develop the CAID model. In this article, the researcher only introduce how to develop the components of the CAID model through the Fuzzy Delphi Method during the second stage of DDR. It should be noted that the second stage is divided into a design stage and a development stage. In the design phase, prior to developing the model, the researcher invited five experts to conduct semi-structured interviews. These five experts reached a consensus on the components of the CAID model from the literature review. In the development stage, researchers primarily validate the components of the CAID model that have already reached consensus in the design stage through the FDM.

The FDM represents an enhanced approach that builds upon the traditional Delphi method and incorporates principles from fuzzy theory. (Murray, Pipino, & Gitch, 1985). The FDM is a consensus-building technique that utilizes survey questionnaires to gather opinions from experts. By acknowledging and addressing the inherent fuzziness in survey processes, the FDM ensures that experts' opinions are accurately interpreted and reported, ultimately improving the efficiency and quality of the questionnaires (Glumac et al., 2011). Due to its modification from the classic Delphi method, FDM cannot be considered a wholly new method, as the criteria for selecting respondents remain the same as those of the Delphi method.

In the development stage, there is an FDM survey questionnaire aimed at validating the components and elements of the CAID model. It was created with the purpose of addressing the following inquiries: i) What are the experts' views on the components that should be included in Classroom Activity-Based Instructional Design (CAID)? ii) What are the experts' views on the elements that should be included in the Classroom Activity-Based Instructional Design (CAID) Model? iii) What are the experts' views on the priority sequence of the elements in components that should be arranged in the Classroom Activity-Based Instructional Design (CAID) Model? The article only answered the first question, and the remaining two questions are not addressed in this article.

Procedures In the Fuzzy Delphi Method (FDM)

a. Selection of experts: In this study, the researcher selected a total of 19 experts to perform FDM.
b. Determining the linguistic scale: Hsieh, Lu and Tzeng (2004) point out that this is a 7-point Likert scale that incorporates fuzzy numbers. It is used primarily to address the problem of fuzziness among expert opinions, and each response provides three fuzzy numbers (m1, m2, m3), as shown in the following Figure 1.

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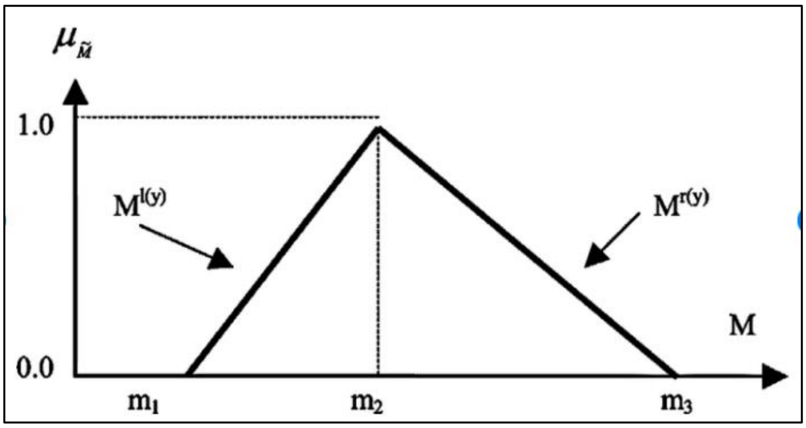

Figure 1. Triangular Fuzzy Number

c. Average fuzzy number: This involves calculating the average of each fuzzy number for all experts based on a formula (Benitez et al., 2007).

$$M = \frac{\sum_{i=1}^{n} mi}{n}$$

d. Identifying threshold value "d": Researchers need to identify the threshold value to determine the consensus level among experts (Thomaidis et al., 2006). This can be calculated using the following formula, where (M1, M2, M3) refers to the average fuzzy number, and (m1, m2, m3) refers to the fuzzy numbers of each expert for the item.

$$d(\overline{M},\overline{m}) = \sqrt{\frac{1}{3}\left[(M1-m_1)^2 + (M2-m_2)^2 + (M3-m_3)^2\right]}$$

e. Identifying the alpha-cut level: Bodjanova (2006) noted that most of the literature uses an alpha-cut (0.5) to select appropriate elements for the development model since the range of fuzzy numbers is between 0 and 1. Therefore, based on previous literature, this research uses an alpha-cut (0.5) as a cut-off level to select components for the CAID Model.
f. Fuzzy evaluation number: To determine whether experts have reached a consensus on the components of the model, defuzzification of the data is necessary. Thomaidis (2006) mentioned that defuzzification is a method to convert a fuzzy number into a clear real number. The fuzzy evaluation number for each item can be calculated using the formula: DV=⅓×(M1+M2+M3), where M1, M2, and M3 are calculated in the third step. The fuzzy evaluation number must be higher than the alpha-cut (0.5); otherwise, the item has not reached consensus and is not accepted.

Data Analysis

When determining the decision-making process for the components of the CAID model, three conditions need to be met. The first rule of FDM is that consensus among experts is considered reached when the threshold value is less than or equal to 0.2 (Chang, Hsu & Chang, 2011). The second rule of FDM is that the research must calculate expert consensus in percentages, which must exceed 75% (Chang et al., 2011). The third rule of FDM is that the fuzzy score (A)

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average of each component must be above the alpha-cut (0.5) (Bodjanova, 2006). The researcher will input all the voting data in the questionnaire into Microsoft Excel for statistics, and then decide whether to accept these components through the three rules in FDM. The summary of the process is given in Figure 2.

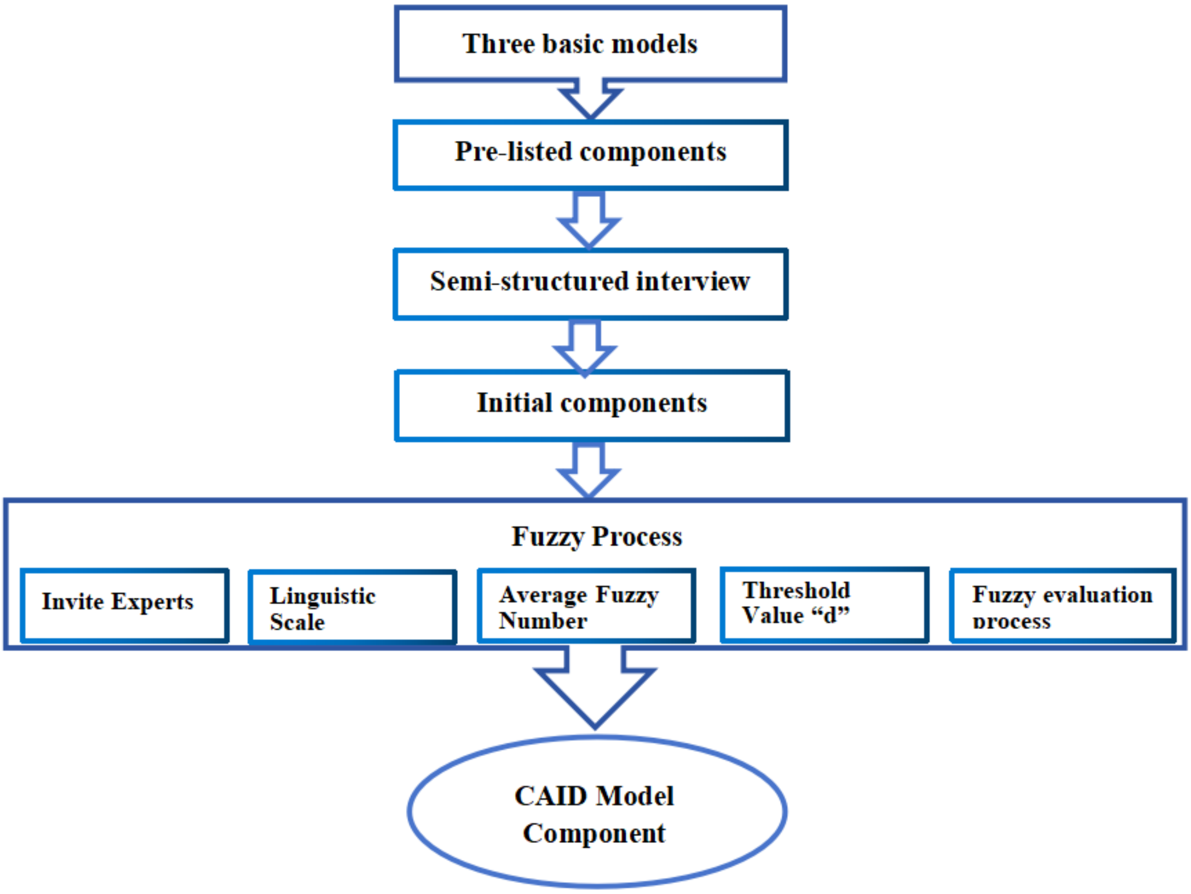

Figure 2. Summary of the Process of Design and Development Phase

The Number of Experts In FDM

In this stage, the researcher selected a group of experts to participate in the study. The effectiveness of FDM relies heavily on the thoughtful choice of the team of experts. Wang and Ho (2019) identified three criteria for selecting experts: a) Subject knowledge and experience: The study purposefully selected TCFL teachers and education teachers, all with over 15 years of experience, to participate in this stage; b) Ability and willingness to participate; c) Capability to express informed opinions on the research and willingness to revise their preliminary judgments to get a consensus.

Damigos and Anyfantis (2011) suggest that the number of experts in FDM can vary significantly, and although there is no one-size-fits-all approach, it is advisable to aim for a participant range of 10 to 50 individuals. Moreover, Kuo and Chen (2008) believe that 15 to 20 experts are most suitable for product development. Therefore, the researcher choose 19 experts to develop a CAID model.

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Finding

Demographics Of Experts

The researcher selected 19 experts to develop the CAID model using FDM. The backgrounds of the 19 experts are as follows:

a. Teaching Chinese as a Foreign Language: The researcher selected 16 TCFL experts (7 professors, 8 associate professors, and one senior lecturer), all with over 15 years of TCFL experience.
b. Education: Three experts dedicated to the field of educational research (two professors and one associate professor), each with over 15 years of experience in education.

Main Components of The CAID Model Based On FDM

Table 3 presents detailed data, including the threshold value (d), the experts' acceptance percentage, and the fuzzy Score (A). All results meet the requirements of the fuzzy Delphi method, so it can be concluded that experts have reached a consensus and that every component of the CAID model is accepted. In a future stage, the study will examine the usability of the model components using the Modified Nominal Group Technique (NGT).

Table 3
Findings Of Experts Groups Consensus on The Components

		Triangular Fuzzy Numbers		Condition of Fuzzy Evaluation Process				
No	**Component**	**Threshold Value, d**	**Experts Group Consensus Percentage, %**	**m1**	**m2**	**m3**	**Score Fuzzy (A)**	**Expert Consensus**
1	Analysis	0.063	100.0%	0.784	0.942	1.000	0.909	Accepted
2	Set Instructional Objectives	0.063	100.0%	0.816	0.958	1.000	0.925	Accepted
3	Design Content	0.064	100.0%	0.795	0.947	1.000	0.914	Accepted
4	Design Activity	0.063	100.00%	0.816	0.958	1.000	0.925	Accepted
5	Develop Teaching Aids	0.050	100.00%	0.753	0.926	1.000	0.893	Accepted
6	Implement	0.063	100.00%	0.816	0.958	1.000	0.925	Accepted
7	Evaluate	0.064	100.00%	0.805	0.953	1.000	0.919	Accepted

The CAID model encompasses seven components, which are described as follows:

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The component Analysis

The analysis stage is a crucial phase. Aldoobie (2015) noted that teachers must undergo an analysis phase before formulating teaching plans and implementing instruction. The analysis stage serves as the foundation for all teaching stages. Most scholars agree that the three fundamental types of analysis are learner analysis, content analysis, and context analysis (Tian & Suppasetseree, 2013; Cheung, 2016; Connie, 2020; Lee et al., 2017). This component is adapted from component 1 of the OTIL, TABA, and ASIE models.

The Component Set Instructional Objectives

Instructional objectives are specific and measurable outcomes that students are expected to achieve at the end of the instructional activity (Edinyang, 2016). In activity-based teaching, researcher recommend using Bloom's taxonomy to set instructional objectives. Jha (2023) emphasized that Bloom's taxonomy is an invaluable tool for teachers to accomplish instructional outcomes. Incorporating Bloom's taxonomy into activity-based teaching allows for the design of multi-level activities and helps students progressively master knowledge and skills. This component is adapted from component 2 of the OTIL and TABA models.

The Component Design Content

The design phase uses the results of the analysis phase to design courses and achieve instructional objectives (Steven, 2000). Lee et al. (2017) believe that the first step in course design is to determine the specific content of the class. Designing content includes selecting and organizing content (Taba, 1962). This component is adapted from components 3 of OTIL and components 3 and 4 of the TABA models.

The Component Design Activity

In activity-based teaching, the design of activities is crucial. Teachers need to design appropriate classroom activities based on the analysis, instructional objectives, and content to facilitate student learning and achievement of instructional goals (Malin, 2004). This component is adapted from component 3 of OTIL, components 4 and 5 of TABA, and component 2 of ASIE models.

The Component Develops Teaching Aids

Teaching aids encompass a range of resources, techniques, and methods used in the teaching process. Ordu (2021) highlighted that teaching aids can be categorized into traditional and modern types, based on their time of use. Traditional teaching aids include chalk, blackboards, and books, while modern teaching aids refer to technology-based resources like short videos, cartoons, movies, computers, interactive whiteboards, and more. Teachers can use these aids to stimulate student interest, enhance teaching effectiveness, and better achieve instructional objectives (Guan et al., 2018). In activity-based teaching, integrating various teaching aids into activities can attract student interest and promote knowledge comprehension. This component is adapted from component 4 of OTIL and component 2 of ASIE models.

The Component Implement

Classroom implementation involves putting instructional designs and plans into practice. Linh and Suppasetseree (2016) stated that, in this step, teachers need to carry out the curriculum interactively and effectively. Learner-centered classroom activities are the focal point of the teaching process (Linh & Suppasetseree, 2016). In this study, it primarily refers to the implementation of activities. During activity implementation, teachers will allow students

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considerable autonomy, thus they must manage classroom order effectively. This component is adapted from component 5 of OTIL and component 3 of ASIE models.

The Component Evaluate

Teaching evaluation is a critical stage in the educational process. Teachers gather information through various means to assess students' learning progress and determine whether instructional objectives have been met (Linh & Suppasetseree, 2016). According to Dick, Carey, and Carey (2015), evaluations can be formative or summative. In this study,teachers should constantly observe and listen to students during activities, and provide them with targeted evaluations. At the same time, teachers need to summarize and evaluate students through various methods after the activity, such as homework, classroom tests, questioning, etc. This component is adapted from component 6 of OTIL, component 7 of TABA, and component 4 of ASIE models.

The components of the CAID model are Analysis, Set Instructional Objectives, Design Content, Design Activity, Develop Teaching Aids, Implement, and Evaluate. Figure 3 shows the components of the CAID Model.

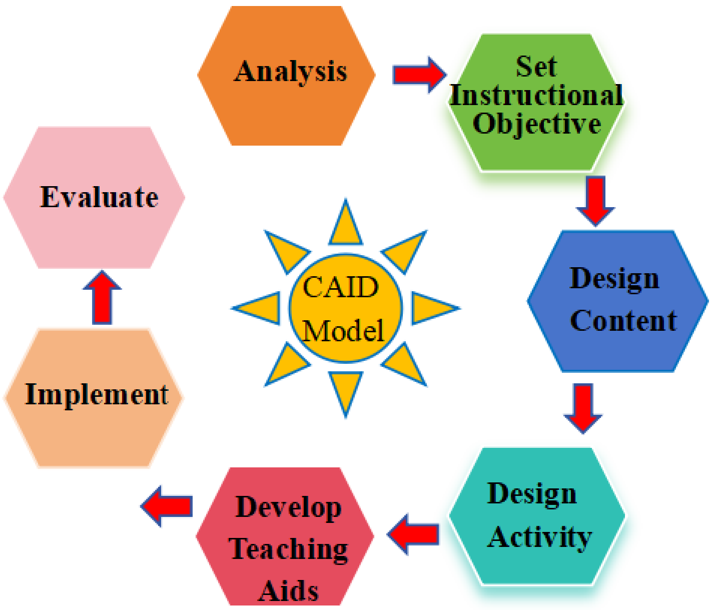

Figure 3. The Components of The CAID Model

Discussion

The CAID model comprises a total of seven components: Analysis, Set Instructional Objectives, Design Content, Design Activity, Develop teaching aids, Implement, and Evaluate. During the design phase, these seven components received unanimous agreement from five experts; in the development stage, table 3 shows that these seven components have achieved consensus among nineteen experts. Andrews and Goodson (1980) highlighted that numerous models have been developed by scholars, and by examining these models, we can discern that most share some fundamental elements. These elements embody the following principles:

- Ascertain learner needs and the learning environment
- Establish learning objectives
- Develop appropriate evaluation criteria

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• Select effective methods for executing instructions
• Test and evaluate the effectiveness of the entire teaching process
• Implement, adjust, and maintain teaching systems

By analyzing the seven components in this study, we can deduce that the formation of these components aligns with the six elements proposed by Andrews and Goodson (1980). Therefore, the components of the CAID model adhere to the essential elements of instructional design and represent a logical and effective instructional design model.

Conclusions

The CAID model is an instructional design model that facilitates teachers in executing activity-based teaching. FDM is an excellent tool for validating the effectiveness of a product. This article has validated and identified the components of the CAID model through FDM, which include seven components: Analysis, Set Instructional Objectives, Design Content, Design Activity, Develop teaching aids, Implement, and Evaluate. These 7 components have been unanimously accepted by experts to help TCFL teachers carry out activity-based teaching.

Although this study designed and developed the components of the CAID model through a review of existing literature, expert interviews and FDM, there may still be additional components yet to be discovered. The ever-changing national education environment, the diversity of features of activity-based teaching, and the complex relationship between teachers and international students all influence the CAID model. Consequently, accurately identifying the essential components of the CAID model remains a challenge that requires ongoing exploration by scholars.

In future research, scholar aim to integrate various elements into each component to further enhance the CAID model. Concurrently, in the third stage of DDR research, the researcher will employ the Modified NGT to evaluate the usability of the developed model.

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Reference

Ah-Nam, L., & Osman, K. (2017). Developing 21st century skills through a constructivist-constructionist learning environment. *K-12 Stem Education*, *3*(2), 205-216.

Aldoobie, N. (2015). ADDIE model. *American International Journal of Contemporary Research,* 5(6), 68-72.

Andrews, D., & L. Goodson. (1980). "A Comparative Analysis of Models of Instructional Design." *Journal of Instructional Development,* 3, No. 4 (1980) 2-16.

Anwer, F. (2019). Activity-Based Teaching, Student Motivation and Academic Achievement. *Journal of Education and Educational Development, 6*(1), 154-170.

International Journal of Modern Education
IJMOE
EISSN: 2637-0905
Volume 6 Issue 23 (December 2024) PP. 284-298
DOI: 10.35631/IJMOE.623020

Aydin, B., Unver, M. M., Bülent, A. L. A. N., & Sağlam, S. (2017). Combining the old and the new: Designing a curriculum based on the taba model and the global scale of English. *Journal of Language and Linguistic Studies, 13*(1), 304-320.

Baserer, D. (2020). Activity Based Teaching of Concept Types. *World Journal of Education, 10*(5), 122-130.

Benitez, J. M., Martín, J. C., & Román, C. (2007). Using fuzzy number for measuring quality of service in the hotel industry. *Tourism Management, 28*(2), 544-555.

Bing, W. (2021). *Application of Game Teaching Method in Teaching Intermediate Oral Chinese as a Foreign Language.* Master's Thesis, Henan University.

Bodjanova, S. (2006). Median alpha-levels of a fuzzy number. *Fuzzy Sets and Systems,* 157(7), 879–891. https://doi.org/10.1016/j.fss.2005.10.015

Bodjanova, S. (2006). Median alpha-levels of a fuzzy number. *Fuzzy Sets and Systems,* 157(7), 879–891. https://doi.org/10.1016/j.fss.2005.10.015

Chang, P.-L., Hsu, C.-W., & Chang, P.-C. (2011). Fuzzy Delphi method for evaluating hydrogen production technologies. *International Journal of Hydrogen Energy, 36*(21), 14172-14179.

Cheung, L. (2016). Using the ADDIE Model of Instructional Design to Teach Chest Radiograph Interpretation. *Journal of Biomedical Education,* 2016, 1–6.

Cong, C (2021). *Practical exploration of classroom activities in Chinese language teaching for Thai children.* Master's thesis, Suzhou University.

Connie,M.(2020).*Types of Analysis for eLearning*.Web:https://theelearningcoach.com/elearning_design/analysis-for-elearning

Damigos, D., & Anyfantis, F. (2011). The value of view through the eyes of real estate experts: A Fuzzy Delphi Approach. *Landscape and Urban Planning, 101*(2), 171- 178.

Dick, W., Carey, L., & Carey, J.O. (2015). *The systematic design of instruction (8th ed.)*. Upper Saddle River, NJ: Pearson Publishing.

Dong, F. (2020). Research on Student Problematic Behavior in Teaching Chinese as a Foreign Language in Confucius Institutes. *Comparative Study on Cultural Innovation* (24), 88-90

Edinyang, S.D.(2016). The necessary of instructional objectives in the teaching and learning of social studies education. *Education for today,*12(2).

Guan, N., Song, J., & Li, D. (2018). On the advantages of computer multimedia-aided English teaching. *Procedia computer science, 131,* 727-732.

Glumac, B., Han, Q., Smeets, J., & Schaefer, W. (2011). Brownfield redevelopment features: applying Fuzzy Delphi. *Journal of European Real Estate Research*, *4*(2), 145–159. https://doi.org/10.1108/17539261111157316

Hsieh, T.-Y., Lu, S.-T., & Tzeng, G.-H. (2004). Fuzzy MCDM approach for planning and design tenders selection in public office buildings. *International Journal of Project Management, 22*(7), 573-584.

Ismail, M. Z., & Balakrishnan, M. (2014, April). An integral ASIE instructional design model: Towards higher order thinking skill in designing instruction. *In National Conference on the Development of Higher Order Thinking Skill* (pp. 14-16).

Jia, F. (2022). *Research on the Application of Short Videos in Intermediate Teaching of Chinese as a Foreign Language.* Master's Thesis, Jiangxi Science and Technology Normal University.

Jiao, R.Y. (2020). *Teaching design in the comprehensive course of primary Chinese based on the thematic model*. Master's thesis, Yunnan University

International Journal of Modern Education
IJMOE
EISSN: 2637-0905
Volume 6 Issue 23 (December 2024) PP. 284-298
DOI: 10.35631/IJMOE.623020
Junhua, Z. (2021). *Application of Orff Music Teaching Method in Online Teaching of Chinese as a Foreign Language*. Master's Thesis, Shanghai Normal University.

Kuo, Y.-F., & Chen, P.-C. (2008). Constructing performance appraisal indicators for mobility of the service industries using Fuzzy Delphi Method. *Expert Systems with Applications,* 35(4), 1930-1939.

Lee, J., Lim, C., & Kim, H. (2017). Development of an instructional design model for flipped learning in higher education. *Educational Technology Research and Development,* 65, 427-453.

Linh, N. D., & Suppasetseree, S. (2016). The Development of an Instructional Design Model on Facebook Based Collaborative Learning to Enhance EFL Students' Writing Skills. *IAFOR Journal of Language Learning, 2*(1), 48-66.

Malin, E. (2004). Designing classroom activities for teaching English to children. *TEFLIN journal, 15*(1), 58-73.

Mei, D.L. (2020). *Role playing teaching design and practice in children's Chinese as a foreign language classroom.* Master's thesis, Sun Yat-sen University.

Murray, T., Pipino, L. L., & Gigch, J. P. van. (1985). A pilot study of fuzzy set modification of Delphi. *Human Systems Management, 5*(1). https://doi.org/10.3233/HSM-1985- 5111

Ordu, U. B. A. (2021). *The Role of Teaching and Learning Aids/Methods in a Changing World.* Bulgarian Comparative Education Society.

Qifen, Z. (2022). *Task based Online Chinese Language Teaching Design for Thai College Students.*Master's Thesis, Hunan University.

Qingyu, X., Jingjin, X., Hangli, S.&Yi, Y. (2021). Research on Classroom Activity Design of Traditional Chinese Culture for Teaching Chinese as a Foreign Language under Virtual Reality (VR) Technology: Taking the Tang Dynasty's Drinking Order as an Example. *Chinese Character Culture* (19), 144-145. doi: 10.14014/j.cnki.cn11-2597/g2.2021.19.062

Richey, R., & Klein, J. D. (2007). *Design and development research: Methods, strategies, and issues*. New York, NY: Routledge.

Ruo, Y.G. (2020). *Research on Teaching Design of Chinese as a Foreign Language Based on Activity Theory.*Doctoral Dissertation, East China Normal University.

Samperio, S. N. (2017). Discovering students' preference for classroom activities and teachers' frequency of activity use. *Colombian Applied Linguistics Journal*, *19*(1), 51-66.

Steven, J.M. (2000).*Instructional System Design (ISD): Using the ADDIE Model*.Web:https://www.lib.purdue.edu/sites/default/files/directory/butler38/ADDIE.pdf

Shu, Z. (2022). Research on the design of classroom activities in Chinese as a foreign language. *Journal of Culture* (06), 185-188

Taba, H. (1962). Curriculum development: Theory and practice. (No Title).

Thomaidis, N. S., Nikitakos, N., & Dounias, G. D. (2006). The evaluation of information technology projects: A fuzzy multicriteria decision-making approach. *International Journal of Information Technology & Decision Making, 5*(01), 89- 122.

Tian, X., & Suppasetseree, S. (2013). Development of an Instructional Model for Online Task-Based Interactive Listening for EFL Learners. *English Language Teaching, 6*(3), 30-41.

Wan, W. X. (2021). *Research on the Performance Test of Confucius Classroom Chinese Language Course at Angkor High School in Cambodia.* Master's Thesis, Liaoning University.

International Journal of Modern Education
EISSN: 2637-0905
IJMOE

Volume 6 Issue 23 (December 2024) PP. 284-298
DOI: 10.35631/IJMOE.623020

Wang, C., & Ho, C. T. (2019). Extensive reading for university efl learners: Its effects and both teachers' and learners' views. *Journal of Language Teaching and Research, 10*(4), 692-701.

Wei,Z. (2018). *Research on Chinese Classroom Management for International Students*. Master's Thesis, Heilongjiang University.

Xun, L. (2021). Following the cause of teaching Chinese as a foreign language for 60 years -- On the development of the cause and discipline of teaching Chinese as a foreign language. *International Chinese Education (Chinese and English),* (04), 22-34.

Yang,Z. (2022). *Research on the Problems and Optimization Countermeasures of Activity Class in Senior High School.* Master's Thesis, Southwest University.

Ying,M.L(2021).*Research on one-on-one Chinese language teaching based on role-playing activities*.Master's thesis,LiaoNing University.

Yang, M. (2021). Game based teaching of Chinese as a foreign language from the perspective of classroom teaching effectiveness. *Journal of Dalian University of Education* (03), 63-64

Zafar, H., & Akhtar, S. H. (2021). Analyzing the effectiveness of activity based teaching and traditional teaching method through students' achievement in sub domain knowledge at secondary level. *Lang. India, 21*, 149-162.

Zain, I. M., & Campus, I. (2017). ASIE model: An innovative instructional design model for teachers in enhancing and sustaining the quality of the 21st century learning. *Systemics, Cybernetics And Informatics, 15*(2).