e-ISSN 2597-9442
DOI: 10.30872/e3l.v7i1.3239
Volume 7 (1), 2024, page 1-13

Pre-Service Teachers' Performance in Applying the ARCS Model On Technology in Education Course

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Abstract

This study aimed to find: (1) to elaborate pre-service teachers' performance in applying the ARCS model on technology in education course; (2) to elaborate pre-service teachers' difficulties and solution in integrating ARCS to technology in education. The Attention, Relevance, Confidence, Satisfaction (ARCS) model is an instructional design framework developed by Keller (2010), the model focuses on strategies to motivate and engage learners in the educational process. This study used a case study with qualitative approach. In this study, the participants were three student-teachers of English Education Department at who met the criteria. The data of this research were collected through interviews and analyzed by using Thematic Analysis adopted from Braun & Clarke (2006). The researcher found that the pre-service teachers in the Technology in Education course relatively had good knowledge of ARCS components. It was concluded that most of the pre-service teachers were able to integrate the core components of ARCS. Some of The EFL pre-service teachers taught their content lesson effectively by using ARCS instructional models with specific technology strategies. The result also showed that various difficulties were faced by the pre-service teachers in integrating ARCS to Technology in Education course. The difficulties were from designing the content, translating the material to media, choosing the suitable template, making the material relevance, and set learning objective. To overcome the difficulties, the pre-service teachers looked for the example, making the outline, and also making careful planning in translating the material.

Keywords: *ARCS, Pre-Service Teacher, Technology in Education Course, Teaching Performance*

1. Introduction

Technology completely changes the way we work, live, and communicate with one another. Alongside from that, we could not avoid that technology takes a wider role to help people make their lives better and less difficult to existence a certain manner. In the education field, Gill & Dalgarno (2017) stated the use of technology in school around the world is considered as an important factor in supporting education. Hence, technology keeps growing as an important tool in education field. However, one of the most aggravating issues teachers and students are currently encountering for using digital technology is a lack of students' motivation. In a recent poll, low motivation is cited as the largest barrier to success in digital technology learning by 76% of undergraduate students and 56% of graduate and professional students

In order to solve this issue, John Keller creates instructional motivational model namely ARCS model. Keller's ARCS instructional motivational model is a strategy for

e-ISSN 2597-9442
DOI: 10.30872/e3l.v7i1.3239
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addressing issues with learning that are innate in learners' low motivation. According to Keller (2010) the ARCS model learners' motivation can be divided into four components: Attention, Relevance, Confidence, and Satisfaction.

Thus, the researcher is interested in conduct this study in order to elaborate the performance of pre-service teachers in applying ARCS Model on Technology in Education Course as their teaching practice. In this study, the researcher will choose participants from the fourth semester of English Department student of Mulawarman University especially the students that have already enrolled in Technology in Education class.

2. Literature Review

Definition of Pre-service Teacher

Lindqvist (2019) states that Pre-service teacher is someone who is still in the process of becoming a teacher. In addition, Keengwe (2022) describe that Pre-service teacher also known as teacher candidates, this term explains students-teacher who enrolled in educational program

Instructional Model

Gregorio & Gray (2022) state the phrase "instructional model" refers to the organization of educational strategies, methods, and activities that focus on particular instructional aims and objectives.

Attention, Relevance, Confidence, Satisfaction (ARCS) Instructional Model

The ARCS model divides motivational concepts and characteristics into four categories: attention (A), relevance (R), confidence (C), and satisfaction (S). Keller (2000) states these four categories represent sets of conditions that must be met in order for a person to be fully functional motivated. Based on Keller (2010) attention refers to the learners' interest in learning. It is critical to capture and maintain learners' interest and attention in learning-teaching process. Meanwhile, referring to Texas (2017), relevance is to bridge the gap between the knowledge and the actual world, the learning process should demonstrate the value of the content. For confidence's component, according Keller (2010), confidence is the interaction between a desire for achievement and a fear of failure. The final letter, S, stands for the satisfaction. Satisfaction is crucial for long-term learning success. Students will be more driven to learn if they are pleased with the output (Kurt, 2022)

Review of Previous Studies

The Relevance Studies of this research is first from Chang, Song, & Fang (2018) with *entitled Integrating ARCS model of motivation and PBL in flipped classroom: A case study on a programming language*. This study firstly proposed a teaching model that integrates attention, relevance, confidence, and satisfaction (ARCS) model and problem-based learning (PBL) and applied the proposed model to a flipped classroom to improve learners' learning motivation and effectiveness. This study uses Quantitave experimental study. According to the experiment, the system significantly increased students' learning motivation across all four ARCS dimensions and learning outcomes. Finally, learners gave positive evaluations of the developed learning system.

e-ISSN 2597-9442
DOI: 10.30872/e3l.v7i1.3239
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The second research is study with entitled *Improving English Listening Proficiency: The Application of ARCS Learning-motivational Model* from Zhang (2015). This study examines qualitative studies using Keller's ARCS methodology of Motivational Design and gives a general overview of the methodology for increasing student motivation throughout class sessions, into their teaching strategies. The result showed how the organization of education in the conventional classroom may be changed to increase student motivation and attention. The research' findings suggested that ARCS is an effective method for raising student interest. The finding showed the ARCS-based learning motivational model can help learners become more motivated and self-assured listeners, which will open the door to successful English listening instruction.

The third study from Sari, Astuti, & Sahrawi (2021) with entitled *An Analysis Of ARCS Model In English As Foreign Language.* This study sought to examine how the instructor and students at SMA Muhammadiyah Sambas' eleventh-grade science students used the ARCS Model in English as a Foreign Language. A descriptive research design using a qualitative methodology was used in the study. 15 science students in the eleventh grade and 1 English instructor participated in the collection of primary data. The suggested study included open-ended online questionnaires and interviews, each of which had ten questions, as well as direct and indirect communication techniques. According to the research's findings from a questionnaire, using motivating learning techniques from the ARCS Model, such as comedy, real-world examples, feedback, and praise, makes it simpler for students to absorb the lesson. Additionally, it increases pupils' motivation, comfort, and compatibility with studying. As a result, it enables the pupils to focus entirely on the lesson, which boosts their passion for learning. Therefore, students believed that the ARCS Model was highly helpful in generating and sustaining high levels of interest among them, as seen by their statements.

The next study is *Integrating ARCS motivational model and flipped teaching in L2 classrooms: a case of EFL expository writing* by Mirzaei, Shafiee, & Rahimi (2020). This study looked at the cooperative effects of ARCS-flipped instruction on the expository writing abilities of Iranian EFL learners. There were two complete classes with fifty-nine EFL students divided into two groups. The ARCS model was incorporated into the flipped writing course for the experimental group. A combination of face-to-face learning environments and hybrid Edmodo was utilized to apply ARCS techniques in addition to the curriculum. The model was used in the in-person writing course as the control setting. A triangulation of data method was used, consisting of writing assignments, the Course Interest Survey, and semi-structured interviews. The ARCS-flipped group outperformed the face-to-face group in their writing performance, according to ANCOVA results. Additionally, learner motivation increased as a result of the technological-motivational synergy. Retrospective views from learners showed that the flipped characteristics of adaptability, learner-centeredness, ease of interaction, and seamlessness of and collaboration catered to the different time-space preferences of the students, which in turn boosted their motivation, level of learning engagement, and writing ability.

3. Methods

Research Design

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This research applied qualitative research as the approach of the study which is defined by Sharan (2009) as how the subjects of the research see the world, how people construct their worlds, how they interpret their experiences, and what significance they assign to those experiences.

Research Participants

The participants in this study are pre-service teachers who attend Technology in Education classes. There are three TIE classes which consist of around 90 students within. Moreover, purposive sampling was applied in this study to determine the participant. Creswell (2013) states purposive sampling means that the inquirer chooses individuals and venues for research because they can help the inquirer grasp the research topic and central phenomenon in the study

Research Instruments

a. Interview

Referring to Yin, (2011), interview is another person's explanation of behavior as well as an action; a recollection. The interview is needed to find out the detailed information that is not got from the documentation.

b. Documentation

Ary (2010) argued that documentation encompasses a wide range of textual, tactile, and visual items, including what other authors may refer to as artifacts.

Data analysis Technique

The data analysis technique that was used in this research is thematic analysis which described by Braun and Clarke (2006) as an organized method for gaining an overview and identifying the core topics of the research

4. Result

Findings

a. Attention Performance

All of the participants employ the methods of using interactive design, applying communication roles, having structured learning activities, using humor in teaching, utilizing questioning techniques, and focusing on maintaining students' attention, it can be affirmed that they have effectively applied the attention components according to the ARCS (Attention, Relevance, Confidence, Satisfaction) Keller Theory.

Interactive design engages students actively, making the learning process dynamic and captivating. Applying communication roles ensures that information is presented clearly and engagingly, contributing to capturing students' attention. Structured learning activities provide organization and predictability, key factors in maintaining focus and attention. Using humor in teaching not only makes the learning experience enjoyable but also enhances engagement, aligning with the attention phase of the ARCS model.

Moreover, questioning techniques foster active participation and critical thinking, crucial for sustaining attention. Finally, the explicit focus on maintaining students' attention ensures that educators are proactively addressing the foundational aspect of motivation within the ARCS framework. Collectively, these methods create an environment that is conducive to capturing and retaining students' attention, laying the groundwork for effective learning experiences.

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TABLE 4.1
Code group and description

Code group (Main Code)	Code	Description
Attention Performance		
Using Interactive Design	- Using video to avoid boredom - Using PowerPoint to attract students' attention. - Using Canva to actively engage with the content.	All of the participants choose the system design that can enhance student engagement, they believe by using Video, PowerPoint, & Canva can avoid boredom, attract students' attention, & encourage students to actively engage in the class.
Applying Communication Role	- Learning Enhancement - Encouraging interaction - Effective explanation Strategy	- P1 believes that the importance of using a louder tone is a strategy to enhance the learning experience. - P2 uses the communication strategy such as more upbeat, cheerful, and happy tone voice when encouraging interaction with her students. - P3 believes that the use of changing voice can help conveying the material.
Having Structured Learning Activities	- The warm-up (free activity) - The main instructional activity - The post-activity assessment.	All of the participants believe that structured approach to learning is consists of three main activities: the warm-up (free activity), the main instructional activity, and the post-activity assessment. The theme emphasizes a well-organized sequence that involves introducing a concept through a warm-up video, reinforcing it with student interaction, and then assessing comprehension through a post-activity.
Using Humor style in Teaching	- Spontaneous Humor - Planned Humor - Light-Hearted - Age-appropriate	- P1 believed that the use of planned humor strategically incorporated into the learning activities to prevent stiffness and promote a relaxed atmosphere - P2 mentioned the use of jokes but emphasizes the need for them to be lighthearted, age-appropriate, and genuinely funny.

e-ISSN 2597-9442
DOI: 10.30872/e3l.v7i1.3239
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		- P3 she just used spontaneous humor.
Questioning technique	- Engagement Recovery - Spontaneous Questioning - Relevance to Material	All of the participants mentioned the using spontaneous questions related to the material as a teaching strategy to re-engage students who might not be paying attention. P2 also adds that the using of questioning technique is meant for interactivity and as a means of assessing whether students comprehend the material.
Maintaining students' attention	- Question Appointment - Interactivity - Assessments - Collaborative Discussion - Judgment Avoidance - Fun games	All participants emphasis on using interactive activities, question appointment, fun games and strategies to engage students actively in the learning process as the things to maintain students' attention.

b. Relevance Performance

According to the interview results, P1, P2, and P3 had some different performances in terms of relevancy. Thus, the researcher had already made some codes related to the relevance performance those are; Alignment for Learning Achievement, Integrating Real-World Experiences Outside classes, making learning Valuable, and Cultivating Excitement.

In conclusion, the four identified components—Aligning for Learning Achievement, Integrating Real-World Experiences, Making Learning Valuable, and Cultivating Excitement—demonstrate a robust alignment with the relevance theory in Keller's ARCS model. Together, these components create a cohesive framework that aligns seamlessly with Keller's emphasis on relevance, fostering a learning environment where educational experiences are purposeful, practical, valuable, and exciting for learners.

TABLE 4.2
Code group and description

Code group (Main Code)	**Code**	**Description**
Relevance Performance		
Aligning for Learning Achievement	- Media Alignment in Teaching - Strategic Lesson Planning. - Adaptive Teaching Strategies.	- P1 using adapted content from a selected book, - P2 emphasizes strategic lesson planning with clear learning objectives - P3 suggests an adaptive teaching strategy.
Integrating Real-World	- Reminding Social	- P1 believed by always reminding

e-ISSN 2597-9442
DOI: 10.30872/e3l.v7i1.3239
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Experiences	Impact - Real-World Example - Creating interesting content	the students about social impact. - P2 believed by giving real-world example. - P3 believed by creating a content that adopted from the material
Making learning Valuable	- Social interacting - Embracing Creative Learning - Positive Experience	- P1 stated by always relating the material with how to use it in social life could help P1 make the learning more valuable - P2 believed by always embracing creativity in learning can make material become valuable. - P3 believed that positive experience such as communication, giving confidence and empathy can make the learning valuable.
Cultivating Excitement	- Enthusiasm in Delivering material - Comprehensive Learning - Adherence to Instructional Methodologies - Leveraging Vocal and body language - Stimulating Discussions	- P1 said by delivering material with enthusiasm can cultivate excitement. - P2 believed in understanding material completely and using appropriate instructional methodologies. - P3 statement kind similar with P1, P3 also added by leveraging vocal expression, body language, and stimulating discussions can help cultivate the excitement in the class.

c. Confidence Performance

Based on the interview results, the researcher found that P1, P2, and P3 had Confidence Performance that researcher divided into three themes such as Holistic Student-Centered Learning, Building a positive expectation, Fostering students' confidences.

TABLE 4.3
Code group and description

Code group (Main Code)	**Code**	**Description**
Confidence Performance		
Holistic Student-Centered Learning	- Letting students practice the material - Student Reflection	- P1 believed to make students believe in their efforts and abilities just letting them to practice the material by themselves. - P2 and P3 stated by giving reflection

e-ISSN 2597-9442
DOI: 10.30872/e3l.v7i1.3239
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	- Effective Assessment Strategies	and assessment at the end of the course can make students believe in their effort and abilities.
Building positive expectations	- Social Connectivity - Teacher as Motivator and Guide - Learning together	- P1 believed interconnectedness of education and social connections can emphasized a role in securing a successful expectation for the students. - P2 and P3, on the other hand believed by giving motivation and guidance can build positive expectation for the students. P2 also added that by learning together can also cultivate the expectation.
Fostering students' confidences	- Active Learning and Assessment - Learning experiences - Positive Teacher-Student Relationships - Recognition of Strengths	- P1 stated the use of active learning will help students enhance their belief of their confidences. - P2 believed by only give them learning experiences, it will make them confident with themselves. - P3 on the other hand, building positive relationships between teachers and recognition of strengths can fostering students' confidence.

d. Satisfaction Performance

Based on the interview results, the researcher gave some codes for the satisfaction performance which are; facilitating practical application and skill integration, fostering students' well-being, and recognition.

TABLE 4.4
Code group and description

Code group (Main Code)	**Code**	**Description**
Satisfaction Performance		
Facilitating Practical Application and Skill Integration	- Encouraging the use of material in real lives - Providing projects	- P1 believed by encouraging students to use the material in real lives help him to become a facilitator of the students in applying their new knowledge. - P2 and P3, similarly, facilitated the students by asking them to make some projects in the class.
Fostering students well- being	- Encouragement and attention - Empowering	- Both, P2 and P3 stated by giving the attention and encouragement can make students in well-being state. P3 also

e-ISSN 2597-9442
DOI: 10.30872/e3l.v7i1.3239
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	Educational Bonds	added Closeness or relationships between students and teachers is necessary for the success of making students in well-being state.
Recognition	- Rewarding Academic Achievement	- All the participants share the same thoughts. They believed giving rewarding to students' achievement can help the students feel pleasure.

e. Pre-Service Teachers' Difficulty in Using ARCS on Technology in Education

Based on the findings, the pre-service teachers met various difficulties when combining the ARCS to the teaching and learning activity. In this sub chapter the researcher also discussed how pre-service teaches overcome their difficulties in using ARCS on Technology in Education course. As for the difficulty, the researcher found two major themes; technology and navigating the material.

TABLE 4.5
Code group and description

Code group (Main Code)	**The Difficulties in Using ARCS on TIE**	**Solutions**
Using Technology	- Designing the content - Translating the material to media - Choosing the suitable template	- Seeking for the examples and learning more about technology - Making the outline - Understanding the material
Navigating the material	- Making the material relevance - Set learning objective	- Making the outline - Thoughtful planning, collaborating, and a deep understanding to the material

Discussion

Indicators of attention in the context of the ARCS (Attention, Relevance, Confidence, Satisfaction) Keller Model involve capturing learners' focus and interest during the educational process. In here, the interview results and documentations reveled all of the participants consistently employed interactive design, effectively engaging students and creating a dynamic learning experience, applying role communication, having structured learning activities, using humor style in teaching, questioning technique, and maintaining students' attention. These teaching components were aligned well with the attention indicators outlined in the ARCS model. In the context of Keller's model, gaining and maintaining attention involves strategies that stimulate interest, curiosity, and engagement. Moreover, interactive design, effective communication, structured activities, humor, and effective questioning are the methods to achieve engaging learning experience (Keller, 2010; Chang, Song, & Fang, 2018).

e-ISSN 2597-9442
DOI: 10.30872/e3l.v7i1.3239
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On the other hand, relevance refers to the perceived connection between the learning material and the real-life word. The relevance indicators in the ARCS model are the educational framework outlined includes strategies for enhancing learner motivation through the lens of relevance. The interview results and documentations found the participants used the approach aligning for Learning achievement to emphasize the importance of aligning educational objectives with individual goals, fostering a sense of purpose, integrating real-world experiences. Lastly, cultivating excitement. This educational approach harmonizes with Keller's ARCS model by consistently emphasizing the relevance of learning content to individual needs, goals, and interests. This result was supported with Sari, Astuti, & Sahrawi (2021) stated that the indicators related to relevance in Keller's ARCS model involve emphasizing the value, aligning with goals, building on existing knowledge, maintaining interest, incorporating variety, and offering choices in the learning experience.

Conversely, Confidence component is associated with building learners' self-assurance and belief in their ability to succeed. Indicators of confidence in the ARCS model are observable signs or behaviors that suggest learners are developing or experiencing increased confidence in their learning process. The researcher found that the participant used strategies of holistic student-centered learning, building positive expectations, and fostering students' confidences. This directly aligns with the Confidence component of the ARCS model. This result was also supported with Mahmudah (2016) and Sari, Astuti, & Sahrawi (2021), they believed strategies such as providing constructive feedback, celebrating achievements, and creating a supportive environment contribute to students' confidence in their abilities

The last component of ARCS is called satisfaction, and they relate to successful completion driven by intrinsic motivation and external rewards, which serve to reinforce and condition learning. The Satisfaction indicator itself underscores the importance of creating a positive and enjoyable learning experience. The researcher found the participants already aligned satisfaction performance with facilitating practical application and skill integration, fostering students well- being, recognition as the strategies to improve students' satisfaction. This was supported with Keller (2010) and (Zhang, 2015), they stated incorporating these strategies compliments, allowing demonstrations of abilities, and creating positive learning environment can contribute to an enriched learning experience and increased satisfaction among students.

The difficulties in using technology appeared as the most factor that affected ARCS components on Technology in Education course. The challenges in integrating ARCS components into a Technology in Education course primarily revolve around designing and translating the content to the media. For addressing these challenges involves a comprehensive approach that considers both the technological and instructional aspects of the educational.

Based on the discussion above, the researcher can conclude that pre-service teachers applied well the ARCS instructional model on Technology in Education course, both the same findings as previous studies as well as the results of performances that have not been revealed in previous studies as a result of updates from contextual and situational differences at that time.

e-ISSN 2597-9442
DOI: 10.30872/e3l.v7i1.3239
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5. Conclusion

The research conducted on pre-service teachers in the Technology in Education course revealed a commendable level of proficiency in understanding and applying the ARCS components. The findings indicate that a majority of the pre-service teachers demonstrated a strong grasp of the core elements of the ARCS model, showcasing their ability to integrate these components effectively into their instructional practices. Notably, some of the participants exhibited a particularly adept application of ARCS by incorporating specific technology strategies into their content lessons. This suggests a promising trend toward the successful implementation of the ARCS instructional model in the context of technology-enhanced teaching. Overall, the research underscores the potential of pre-service teachers to adeptly utilize ARCS components, paving the way for the continued improvement of instructional approaches on Technology in Education.

The research findings also illuminate the challenges encountered by pre-service teachers in integrating the ARCS model into the Technology in Education course. Notably, difficulties were identified in several key areas, encompassing the design of content, translating the material to media, selecting appropriate templates, ensuring material relevance, and establishing clear learning objectives. These challenges underscore the complexities inherent in aligning the ARCS model with the demands of a technology-infused educational context. However, the research also sheds light on the proactive strategies employed by pre-service teachers to overcome these obstacles. By seeking examples, creating structured outlines, and carefully planning the translation of material, these educators demonstrated resilience and resourcefulness in navigating the integration of ARCS into the Technology in Education curriculum. The identified difficulties serve as valuable insights for educational institutions and instructional designers aiming to better support pre-service teachers in successfully applying motivational models like ARCS within the realm of technology-enhanced learning.

e-ISSN 2597-9442
DOI: 10.30872/e3l.v7i1.3239
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e-ISSN 2597-9442
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