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Attention-Relevance-Confidence-Satisfaction (ARCS) Instructional Model on Learners' Academic Performance and Motivation in Grade 10 Science

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Abstract: This study examines the effectiveness of the ARCS instructional model in terms of Attention, Relevance, Confidence and Satisfaction in enhancing the academic performance and students' motivation among Grade 10 science learners at Philippine College Foundation. Recognizing the importance of motivation to learning the ARCS instructional model addresses common barriers to students' academic performance particularly in challenging subjects like science. A researcher-made academic performance exam and an adapted motivation questionnaire were used in a pre-experimental one-shot design to evaluate the effect of ARCS instructional model. Findings revealed that the students' posttest means' scores increased. The results showed a considerable improvement in academic performance, even if they were still within the *Low Proficient* level. Furthermore, there were considerable improvements in all the components of ARCS Instructional Model, Attention, Relevance, Confidence, especially Satisfaction. The results of statistical analysis showed a considerable impact and a significant improvement in academic performance. The results indicate that the ARCS model successfully promotes learning outcomes and learners' motivation, underscoring the necessity of continual teacher preparation programs and additional studies into the ARCS instructional model's long-term impacts across a range of disciplines and educational levels.

Keywords: *Attention, Relevance, Confidence, Satisfaction, Motivation.*

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I. INTRODUCTION

Grade 10 represents an important event in a student's academic journey, particularly in foundational subjects like science. It is a year where students often strengthen their understanding of core scientific principles, which can significantly influence their future academic and career pathways. However, there are obstacles in capturing and maintaining their motivation in complex scientific ideas. Effective instructional strategies imparting knowledge and igniting and sustaining learners' motivation are essential. Addressing these motivational challenges can enhance learning outcomes and a more positive attitude towards science.

The ARCS instructional model, developed by John Keller, is a framework designed to increase motivation in learning. It centers around four key components: capturing attention, establishing relevance, building confidence, and ensuring satisfaction in the learning process. The ARCS instructional model indicates that motivation is driven by making learning engaging and varied, connecting it to learners' needs and prior knowledge, fostering a belief in their ability to succeed through clear goals and feedback, and providing a sense of accomplishment and reward. It has been widely adopted across various educational contexts, including higher education and K–12 settings, demonstrating its value in instructional design (Zhu & Burrow, 2022).

Motivation is a crucial component of human behavior for student learning and improved performance (Filgona et al., 2020). According to Sakroni et al. (2019), motivation is the intentional use of movement, direction, and maintenance of an individual's behavior to achieve specific goals or outcomes. Scholars have invested considerable effort into identifying motivational models that enhance students'

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academic achievement and encourage a desire to learn (Refat et al., 2019; Ng & Chu, 2021). As Ucar and Kumtepe (2020) note, student motivation has taken center stage in many learning environments.

The study by Alcasoda & Balaoro (2022) revealed that integration of the ARCS model through its four components—attention, relevance, confidence, and satisfaction— highlights a significant impact on learners' performance and further implies that it can be used as an innovative tool to engage and motivate students while learning. Research by Montero (2018) further highlights that the ARCS model has a significant impact, particularly in promoting a deeper understanding of science subjects. Effective implementation of this model requires thoughtful planning, and its broader adoption in science classrooms can improve academic outcomes. As teachers undergo more training, they become better equipped to apply science-specific skills and strategies, ultimately minimizing challenges in the teaching-learning process.

Private school science teachers are having difficulties in implementing the curriculum, allocating few resources, and carrying out hands-on science instruction. The ability of science teachers at private schools to provide excellent science instruction and encourage student interest is delayed by a lack of continuing training and support. This suggests a need for focused professional development programs to improve teachers' proficiency with innovative scientific knowledge, technological integration, and contemporary pedagogical approaches. Improving teaching preparedness has the potential to decrease achievement gaps, advance educational equity, and result in laws requiring continuous professional development. (Baniqued & Bautista, 2024).

The K-12 curriculum in the Philippines, implemented starting in 2013, provides students with a comprehensive and well-rounded education that gives them the values, information, and abilities they need for further education, the workforce, and entrepreneurship. It aims to cultivate critical thinking, Filipino values, and global citizenship while preparing students for lifelong learning and making them intellectually and socially capable. Additionally, the curriculum encourages diversity and guarantees that every student has access to high-quality instruction that satisfies various requirements, preparing them for domestic and international issues (Department of Education, 2013).

This study applies the four components of the ARCS instructional model—attention, relevance, confidence, and satisfaction—that provide a structured and systematic approach to designing instruction that aims to capture and sustain learners' motivation throughout the learning process, particularly science. It assesses academic performance and motivation in grade 10 science that aligns with the K–12 curriculum framework. The study's findings can be used to further research into teaching and learning in other areas of science.

Generally, this study aims to determine the academic performance and motivation of the Grade 10 learners of the Philippine College Foundation through the ARCS instructional model.

➢ *Specifically, this will Seek to Answer the Following Questions:*

- What is the learners' academic performance in Science 10 when exposed before and after the ARCS instructional model?
- What is the level of learners' motivation in terms of:

✓ Attention
✓ Relevance
✓ Confidence
✓ Satisfaction?
✓ Is there a significant difference in the academic performance of Science 10 learners when exposed before and after ARCS instructional model?
✓ Is there a significant difference in the learners' motivation of Science 10 when exposed before and after ARCS instructional model?

II. LITERATURE REVIEW

➢ *ARCS Instructional Model and Academic Performance*

The ARCS model, developed by John Keller in the 1980s, is an instructional design framework emphasizing motivation in learning environments. It consists of four elements that help capture student interest, establish relevance, foster confidence, and provide satisfaction through internal or external rewards (Fang et al., 2023). These components are grounded in research on human motivation in educational settings and offer a structured approach to enhancing student engagement and success.

Subbiah (2024) emphasized that ARCS-based instruction improves academic performance and motivation, advocating the need to develop specialized methods across all subject areas. In science education, fostering motivation through ARCS strategies can create engaging learning experiences supporting academic achievement and lifelong learning. Building on this, a study by Jatmoko et al. (2021) found that implementing the ARCS model significantly enhanced student learning outcomes, increasing engagement and increasing academic performance. This suggests the ARCS model fosters a constructive and effective learning environment, making it particularly valuable for high school education. Further supporting this, Daugherty (2019) highlighted the model's effectiveness in creating enjoyable learning experiences, with many students giving positive feedback. The model fills a research gap regarding practical, motivational design in daily instruction, offering strategies for evaluating and implementing effective teaching methods. Additionally, Montero (2019) emphasized that the ARCS Model is useful and helpful in understanding the lesson better. Thus, intensifying its application to science teaching may result in a higher academic performance of the students in science.

Cardenas and Guerrero (2019) also noted that the ARCS model effectively addressed challenges presented by the

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COVID-19 pandemic, demonstrating adaptability across diverse educational contexts. Additionally, research by Chang et al. (2021) showed that students in experimental groups using the ARCS model achieved higher learning outcomes than those in control groups, further validating its effectiveness.

➢ *ARCS Instructional Model and Motivation*

Motivation is a crucial component of human behavior and is essential for student learning and improved performance (Filgona et al., 2020). In educational research, motivation is a vital topic due to its close correlation with students' learning objectives. Scholars have invested considerable effort into identifying motivational models that enhance students' academic achievement and encourage a desire to learn (Refat et al., 2019; Ng & Chu, 2021). As Ucar and Kumtepe (2020) note, student motivation has taken center stage in many learning environments.

According to Sakroni et al. (2019), motivation is the intentional use of movement, direction, and maintenance of an individual's behavior to achieve specific goals or outcomes. Motivation is a critical factor in predicting student achievement (Kriegbaum et al., 2018). The COVID-19 pandemic has significantly impacted students' academic performance; Araujo et al. (2021) found that isolation during the pandemic led many concerned students to experience a notable decline in academic motivation. This aligns with the theory that psychological factors such as stress, anxiety, and discomfort during emergencies and quarantines adversely affect learning.

Additional studies have shown that the ARCS model strongly influences students' learning motivation, with high motivation reflected in productive classroom activities (Afjar et al., 2020). Following the introduction of the ARCS approach, students' final learning outcomes were assessed through evaluation tests. Wu (2018) emphasized that teaching performance and students' cognitive outcomes heavily depend on educators' understanding and application of techniques like the ARCS model in their instructional design to create engaging materials that inspire learning.

Motivation theories suggest a positive correlation between academic success and motivation. While this relationship has been explored in numerous global studies, research in the Philippine educational context remains limited. Sabanal et al. (2023) examined students' academic achievement in science alongside their enthusiasm for learning, finding a highly satisfactory level of academic performance and generally good motivation. Furthermore, their study revealed a significant positive correlation between students' academic achievement and their eagerness to learn. To foster meaningful learning experiences, teachers strive to cultivate motivation among students. However, various factors can hinder student engagement in a typical educational setting. The emergence of COVID-19 has worsened existing learning challenges and highlighted additional educational issues that vary by country, disproportionately affecting disadvantaged student populations and widening the educational divide. Furthermore, not all students experienced the same learning environment due to differing social and economic circumstances, as well as emotional factors that contributed to reduced motivation (Cardenas & Guerrero, 2022).

III. METHODOLOGY

This research utilized a pre-experimental one-shot design to assess students' academic performance and motivation in science, utilizing the ARCS instructional model. The study will be conducted on one section of Grade 10 Junior High School students from Philippine College Foundation.

This study was conducted at Philippine College Foundation Basic Education Department, Purok 4, Poblacion, Valencia City, Bukidnon, Philippines. PCF follows the K to 12 Science Curriculum, aligning with government requirements mandated by RA 10533. PCF has a total of 25 faculty members. All License Professional Teachers for the Junior High School faculty and some are ongoing with their graduate studies.

The study involved one section of Grade 10 Junior High School students from Philippine College Foundation for the school year 2024-2025 with forty (40) students in one section. The section took biology during the study period. The students will receive exposure to the ARCS instructional model approach.

➢ *Design and Development of the Lesson*

- *Design and Development of the ARCS Instructional Model with the 7E Lesson Plan*

Based on a synthesis of motivational principles and traits into the four areas of attention (A), relevance (R), confidence (C), and satisfaction (S), the ARCS instructional model was developed by John Keller (1984). These four categories stand for sets of requirements that an individual must meet to be completely motivated. Students were expected to perform/accomplish the subsequent learning steps. These steps will be presented to the students before the intervention, as well as the lesson's learning objectives.

✓ *Elicit (Attention Phase):*

In this phase, the teacher may start by recalling the previous lesson and asking questions to find out what the students already know about the subject.

✓ *Engage (Attention Phase)*:

In this phase, to demonstrate the importance of the topic, relate it to the students' individual interests or experiences. To capture students' interest and stimulate their curiosity, use engaging exercises or present real-world scenarios.

✓ *Explore (Relevance Phase):*

Offer students the chance to investigate the subject through practical exercises or experiments. Here, the Explore phase can incorporate ARCS techniques like defined goals and scaffolded support to help students develop their confidence as they interact with the content.

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✓ *Explain (Confidence Phase)*:

Clearly explain the subject while making a connection to the students' past knowledge, it could be through further discussion or through video presentation that supports the discussion. In this phase, students must show that they understand. By providing opportunities for self-reflection and positive reinforcement. Integrating confidence in the ARCS model and making sure students feel appreciated for their accomplishments (Keller, 1999). Additionally, the teacher might use the reward system.

✓ *Elaborate (Relevance Phase):*

Provide students with the chance to apply what they've learned to new situations or challenges. Encourage students to apply what they have learned by providing them with support and feedback.

✓ *Evaluate (Relevance and Satisfaction Phase):*

In this phase, the teacher will evaluate the students learning by employing any form of assessment to assess their knowledge and understanding.

✓ *Extend (Relevance Phase):*

In this phase, the teacher will give assignments to the students related to the topic discussed.

The study employed two research instruments: a researcher-made academic performance test and an adapted motivation questionnaire checklist. Content validation from the pool of experts was employed to sustain content validity and reliability. After the content validation, the instrument will be pilot tested.

The study uses a survey questionnaire for the collection of data. The questionnaire was adapted to measure the four constructs of the ARCS model from John M. Keller (1984), who developed the Instructional Materials Motivation Survey (IMMS). It consists of thirty-six (30) statements, where students rate themselves on a five-point Likert scale that will be used to analyze the students' motivation towards science subjects.

The research was conducted for the third quarter of the school year 2024-2025. One month and a half, from January to the second week of February. The primary data sources for the study were the pretest and posttest. The section received the pretest questionnaire before any intervention was introduced. Subsequently, a post-test will be administered following the students' exposure to the ARCS instructional model. Moreover, each student received a survey questionnaire to gauge their motivation related to science subjects, comparing experiences with the ARCS instructional model.

To answer the first problem on the level of learners' academic performance, descriptive statistics such as mean and standard deviation were utilized before and after exposure to the ARCS Instructional Model. The mean provided the average performance score of the students in the pretest and posttest, while the standard deviation reflected the variability of scores. These measures allowed the researcher to determine the general performance trend and how scores were distributed relative to the mean, offering a clear picture of students' performance progression.

For the second problem on the level of learners' motivation in terms of attention, relevance, confidence, and satisfaction, the researcher also employed descriptive statistics such as mean and standard deviation. This enabled the researcher to capture the central tendency and spread of motivational responses before and after the intervention. The descriptive results helped determine whether learners' motivation levels improved across the four components of the ARCS model.

For the third problem, the paired-sample T-test was utilized to investigate whether a significant difference exists in students' academic performance before and after exposure to the ARCS instructional model. This statistical test is appropriate for comparing two related samples, the same group of students' scores before and after the intervention. It helped determine whether the observed change in academic performance was statistically significant or could have occurred by chance.

For the fourth problem, the paired-sample T-test was utilized to investigate whether a significant difference exists in learners' motivation before and after exposure to the ARCS instructional model. The motivation scores covering attention, relevance, confidence, and satisfaction were collected before and after exposure to the ARCS instructional model. This analysis allowed the researcher to assess whether the ARCS model significantly influenced learners' motivation levels beyond what could be attributed to random variation.

IV. PRESENTATION, ANALYSIS, AND INTERPRETATION OF DATA

Table 1 Mean and Standard Deviation of the Academic Performance of Science 10 before and After Exposure to ARC Instructional Model

Variable	**N**	**Pretest**			**Posttest**		
		Mean	**SD**	**Descriptive Level**	**Mean**	**SD**	**Descriptive Level**
Test Scores	40	18.49	4.204	Low Proficient	24.03	5.724	Low Proficient

Score Range	Pretest (*N=40*)		Descriptive level	Posttest (*N=40*)		Descriptive level
	(f)	%		(f)	%	
45-50	0	0	Highly Proficient	0		Highly Proficient
38-44	0	0	Proficient	1	2.5	Proficient
25-37	2	5	Nearly Proficient	17	42.5	Nearly Proficient
13-24	38	95	Low Proficient	22	55	Low Proficient
0-12	0	0	Not Proficient	0	0	Not Proficient

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The data in Table 1 provide a lens into the academic performance of Science 10 students before and after their exposure to the ARCS Instructional Model. The pretest results indicate that students had a mean score of 18.49 with an SD of 4.204, which falls within the *Low Proficient* level. This suggests that before instruction, most students demonstrated limited understanding of the subject matter, with their scores on the *Low Proficient* level. The relatively low standard deviation of 4.204 indicates that the student's pretest scores were somewhat clustered around the mean, meaning there was less variability in their initial performance. On the other hand, only two (2) students fell to *Nearly Proficient*.

After exposure to the ARCS Instructional Model, the students' mean posttest score increased to 24.03 with an SD of 5.724, still on the *Low Proficient* level. However, there has been a notable increase in the learners' posttest scores. This shift implies that the instructional model positively impacted their academic performance, helping students acquire and retain more knowledge. The increase in standard deviation of 5.724 suggests that the posttest scores were more spread out compared to the pretest, indicating that while some students improved significantly, others may have experienced only marginal gains. Additionally, there were twenty-three (22) learners who fell to the *Low Proficient*, seventeen (17) to the *Nearly Proficient* level, and one (1) to the *Proficient*.

The score improvement from 18.49 to 24.03 reflects a notable learning gain, though it remains within the *Low Proficient* category. This suggests that students have demonstrated progress but have not yet reached higher proficiency levels. Given that the threshold for *Nearly Proficient* begins at a score of 25, further instructional reinforcement may be necessary to elevate students to higher performance levels. The observed improvement indicates that the ARCS instructional model effectively enhances student learning but may need additional support to push students beyond the developing stage. These descriptive statistics highlight the instructional model's role in improving student performance, as evidenced by the increased mean scores. However, the data also reveal that many students remain below Low proficiency, suggesting room for pedagogical refinement.

This finding is supported by the study (Montero, 2019) that students' academic performance has been significantly impacted by the ARCS Model, which is beneficial and helpful in gaining a deeper comprehension of the science lesson. While using this instructional model requires careful planning and preparation, increasing its use in scientific training may lead to improved academic performance. Moreover, educators widely acknowledge the ARCS model (Attention, Relevance, Confidence, and Satisfaction) as an effective tool for promoting student motivation (Fang et al., 2023). Özer (2020) highlighted the model's effectiveness in creating enjoyable learning experiences, with many students giving positive feedback. The model fills a research gap regarding practical, motivational design in daily instruction, offering strategies for evaluating and implementing effective teaching methods. Daugherty (2019) highlighted the model's effectiveness in creating enjoyable learning experiences, with many students giving positive feedback.

The model fills a research gap regarding practical motivational design in daily instruction, offering strategies for evaluating and implementing effective teaching methods. Additionally, Jatmoko et al. (2021) demonstrated that using the ARCS model improved learning outcomes and student learning activities. It has been demonstrated that the exploration of learning activities during learning may be documented and have a highly effective effect since students tend to have positive motivation, which helps ensure that the learning process in the classroom generally proceeds positively.

Table 2 Level of Learners' Motivation in Terms of Attention.

	Presurvey			**Postsurvey**		
Variables	**Mean**	**SD**	**QD**	**Mean**	**SD**	**QD**
The way the information was arranged on the pages of the lesson helped keep my attention.	3.58	1.010	Motivated	4.00	0.641	Motivated
There was something interesting at the beginning of this lesson that got my attention.	3.53	0.877	Motivated	3.93	0.888	Motivated
The quality of the writing of this lesson helped to hold my attention.	3.50	0.847	Motivated	4.00	0.641	Motivated
The material of this lesson stimulated my curiosity.	3.43	0.958	Motivated	3.93	0.694	Motivated
I learned some lessons was surprising and unexpected.	3.38	1.005	Motivated	4.05	0.846	Motivated
The materials used in the lesson were eye-catching.	3.35	0.834	Moderately Motivated	4.08	0.694	Motivated
The variety of reading passages, exercises, illustrations, etc., helped keep my attention on the lesson.	3.33	0.888	Moderately Motivated	3.98	0.698	Motivated
The style of writing was boring.*	3.23	0.832	Moderately Motivated	3.73	0.960	Motivated
The pages of this lesson material look dry and unappealing.*	2.95	0.677	Moderately Motivated	3.83	1.059	Motivated

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There are so many words on each page that was irritating.*	2.93	0.997	Moderately Motivated	3.90	0.900	Motivated
This lesson was so abstract that it was hard to keep my attention on it.*	2.70	0.823	Moderately Motivated	3.93	0.764	Motivated
The amount of repetition in this lesson caused me to get bored sometimes.*	2.68	0.888	Moderately Motivated	3.93	0.997	Motivated
Overall Mean	3.22	0.886	Moderately Motivated	3.94	0.815	Moderately Motivated

The data on ARCS motivation regarding Attention reveals a notable improvement after the intervention. The presurvey results showed an overall mean score of 3.22 with SD=0.886, categorized as *Moderately Motivated*, while the postsurvey results increased to 3.94 with SD=0.815, indicating a higher level of engagement. Among the pretest results, the highest mean score 3.58 with SD=1.010 categorized as *Motivated* was observed in the statement. The *way the information was arranged on the pages of the lesson helped keep my attention*, suggesting that the lesson's structure was already somewhat engaging.

After exposure to the ARCS instructional model, all variables of Attention improved, with the highest post-survey mean of 4.08, categorized as a *Motivated level*. *The materials used in the lesson were eye-catching*, highlighting the positive impact of incorporating more visually engaging materials. The overall improvement suggests that the intervention effectively enhanced student attention by reducing redundancy, improving the layout, and using more stimulating materials.

These findings align with research on Attention as a critical cognitive function necessary for effective learning and academic success. The first category of the ARCS model, Attention, plays a fundamental role in information processing, as learners need to focus on relevant details while filtering out distractions (Valdez, 2019). In educational settings, sustaining Attention is crucial, much like biological systems that selectively focus on important stimuli amid vast amounts of data (Niu, 2021). Gallen et al. (2023) emphasize that sustained Attention develops over time and is a strong predictor of academic success, reinforcing the significance of designing educational materials that keep learners engaged. Keller et al. (2020) suggest that teachers should integrate both internal and external focus strategies to help students maintain Attention, which is evident in the improvements observed in the post survey results.

Moreover, research confirms that attentive students consistently outperform their peers, as focused engagement enhances comprehension and retention (Hoidn & Reusser, 2020; Trabelsi et al., 2023). Students who remain engaged throughout lessons also demonstrate stronger participation in discussions and activities, contributing to higher academic achievement (Dörnyei & Muir, 2019). The significant improvement in students' motivation regarding Attention supports the idea that well-structured, visually stimulating, and thoughtfully designed learning materials play a crucial role in fostering engagement and improving learning outcomes.

Table 3 Level of Learners' Motivation in Terms of Relevance.

	Presurvey			**Postsurvey**		
Variables	**Mean**	**SD**	**Variables**	**Mean**	**SD**	**Variables**
The content and style of writing in this lesson convey the impression that its content was worth knowing and very helpful to me.	3.63	0.897	Motivated	4.25	0.707	Highly Motivated
It is clear to me how the content of this material is related to things I already know.	3.48	0.987	Motivated	3.55	0.714	Motivated
There are stories, pictures, or examples that showed me how this material could be important to some people.	3.48	0.987	Motivated	3.83	0.874	Motivated
Completing this lesson successfully was important to me.	3.43	0.931	Motivated	4.15	0.802	Motivated
There are explanations or examples of how people use the knowledge they can gain in this lesson.	3.40	0.900	Motivated	4.08	0.797	Motivated
The content of this material is relevant to my interests.	3.28	0.933	Motivated	3.95	0.749	Motivated
Overall Mean	3.45	0.945	Motivated	3.97	0.81	Motivated

Table 3 presents the level of learners' motivation in terms of Relevance, comparing the presurvey and postsurvey results. The table displays the mean and standard deviation for six variables during the presurvey and post-survey, alongside the overall mean and SD for each measure. These variables assess various dimensions of Relevance, including the clarity of the material's connection to prior knowledge, its perceived importance, and its Relevance to learners' interests. Notably, the item *The content and style of writing in this lesson convey the impression that its content was worth knowing and very helpful to me* exhibited the highest mean in the presurvey 3.63 with SD=0.897 and showed a substantial increase in the postsurvey 4.25 with SD=0.707, moving from a *Motivated* to a *Highly Motivated* rating. Similarly, the statement *Completing this lesson successfully was important to me* recorded a post-survey mean of 4.15 with SD=.802, categorized as *Motivated*, reflecting strong motivation.

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An overall increase in mean scores across all six variables was observed, with the total mean rising from 3.45 in the presurvey to 3.97 in the post-survey. This improvement was accompanied by a decrease in the standard deviation from 0.945 to 0.81, suggesting a general increase in learners' motivation and a greater consistency in their responses after exposure to the ARCS instructional model. The shift categorized on the *Motivated* level indicates that learners perceived the lesson material as more relevant, valuable, and personally meaningful after the ARCS intervention. These findings suggest that materials perceived as relevant, valuable, and well-articulated are more likely to engage students and enhance their motivation.

These results are consistent with prior research highlighting the critical role of Relevance in fostering student motivation. Kew et al. (2018) emphasized that students exhibit higher motivation when content is viewed as relevant and applicable to real-life situations. Based on the ARCS model, their study demonstrated that incorporating relatable examples and well-defined learning objectives can significantly enhance student engagement. Similarly, Chiu et al. (2021) found that relevant course materials increase student interest and persistence, particularly in online learning contexts, such as during the COVID-19 pandemic.

Li and Keller (2021) further supported these findings, suggesting that learners who recognize the personal value of their studies are more likely to engage deeply with the material, leading to better comprehension and academic achievement. Moreover, Munna & Kalam (2021) noted that when students perceive the learning content as meaningful, their intrinsic motivation is strengthened, encouraging continued academic efforts. Watters (2023) also argued that connecting course material to practical applications, career prospects, and personal interests enhances the perceived value of the learning experience, thus making it more compelling and engaging for students.

Table 4 Level of Learners' Motivation in Terms of Confidence.

	Presurvey		Postsurvey			
Variables	**Mean**	**SD**	**Variables**	**Mean**	**SD**	**Variables**
Confidence						
As I was progressing with this lesson, I developed confidence that I would be able to pass a test on it.	3.50	1.155	Motivated	3.98	0.733	Moderately Motivated
The good organization of the content helped me be confident that I would learn this material.	3.43	0.903	Motivated	4.10	0.709	Motivated
As I worked on this lesson, I was confident that I could learn the content.	3.35	0.770	Moderately Motivated	3.93	0.764	Moderately Motivated
After reading the introductory information, I felt confident that I knew what I was supposed to learn from this lesson.	3.33	0.888	Moderately Motivated	3.90	0.744	Motivated
When I first looked at this lesson, I had the impression that it would be easy for me.	3.23	1.121	Moderately Motivated	3.95	0.749	Motivated
This material was more difficult to understand than I would like for it to be.*	2.80	0.911	Moderately Motivated	3.60	0.955	Motivated
Many of the pages had so much information that it was hard to pick out and remember the important points.*	2.80	0.939	Moderately Motivated	3.75	0.840	Motivated
The exercises in this lesson were too difficult.*	2.68	0.971	Moderately Motivated	3.63	1.005	Motivated
Overall Mean	3.14	0.957	Moderately Motivated	3.86	0.812	Motivated

Table 4 presents the mean and standard deviation (SD) of learners' motivation regarding confidence, comparing the presurvey and post-survey results. The findings demonstrate a notable improvement in confidence levels after the intervention, with the overall mean score increasing from 3.14 with SD = 0.957 in the presurvey to 3.86 with SD = 0.812 in the post-survey. This shift from a *Moderately Motivated* to a *Motivated* category suggests that the instructional intervention positively affected students' belief in their ability to learn and succeed.

Before the intervention, the highest mean score was recorded for the statement. *As I was progressing with this lesson, I developed confidence that I would be able to pass a test on it* with a mean score of 3.50, SD = 1.155, categorized on the Motivated level. This indicated that even before exposure to the ARCS instructional model, students had moderate confidence in their ability to succeed academically. After the intervention, this item improved to a mean score of 3.98 with SD = 0.733, still on the *Motivated* level showing that students developed a stronger belief in their capacity to perform well.

In the post-survey, the highest mean score was observed for the statement. *The good organization of the content helped me be confident that I would learn this material* with a mean score of 4.10 with an SD=0.709. The significant increase from its presurvey mean score of 3.43 with SD = 0.903 highlights the impact of organized instructional content on boosting students' confidence. The structured presentation of materials provided clearer learning pathways, thus enhancing learners' assurance in mastering the lesson objectives.

The overall findings emphasize that improving the organization of content, adjusting the difficulty of learning

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activities, and providing clear instructional guidance were effective strategies for building learners' confidence. These results are consistent with existing research on the role of self-confidence in academic success. Lone (2021) stressed that confidence is built through recognizing personal strengths and skills and fostering a positive attitude toward learning. Gottlieb (2022) similarly argued that students who believe in their learning capabilities are likelier to persist in their studies and achieve better academic outcomes. Moreover, the results align with the findings of Gines et al. (2019), who highlighted the critical roles that parents, teachers, and school officials play in nurturing students' self-confidence. Continuous encouragement, structured learning support, and motivational strategies are vital in helping students navigate academic challenges successfully.

Table 5 Level of Learner' Motivation in Terms of Satisfaction.

	Pretest			Posttest		
Variables	**Mean**	**SD**	**Variables**	**Mean**	**SD**	**Variables**
Completing the exercises in this lesson gave me a satisfying feeling of accomplishment.	3.58	0.844	Motivated	4.05	0.677	Motivated
I enjoyed this lesson so much that I would like to know more about this topic, and I want to study this lesson.	3.53	0.847	Motivated	4.18	0.747	Motivated
The wording of feedback after the exercises, or of other comments in this lesson, helped me feel rewarded for my effort.	3.50	0.877	Motivated	4.23	0.733	Highly Motivated
It was a pleasure to work on such a well-designed lesson.	3.68	0.829	Motivated	4.48	0.679	Highly Motivated
Overall Mean	3.57	0.849	Motivated	4.24	0.709	Highly Motivated

Table 5 presents the mean and standard deviation (SD) of learners' motivation regarding Satisfaction, comparing presurvey and postsurvey results. The overall mean increased from a mean score of 3.57 with SD = 0.849 to 4.24 with SD = 0.709, indicating an improvement from *Motivated* to *Highly Motivated*. Among the presurvey results, the highest mean score, 3.68 with SD = 0.829, was recorded for the *statement It was a pleasure to work on such a well-designed lesson.* This score significantly rose to 4.48 with SD = 0.679 after exposure to the ARCS instructional model, suggesting that enhancements in lesson design greatly contributed to students' overall Satisfaction and enjoyment of the learning process.

Similarly, notable growth was seen in the statement. *The wording of feedback after the exercises, or of other comments in this lesson, helped me feel rewarded for my effort*, which improved from 3.50 with SD = 0.877 to 4.23 with SD = 0.733. This finding underscores the positive impact of timely, constructive feedback on reinforcing a sense of accomplishment among learners. The results suggest that Satisfaction is closely tied to the quality of instructional design and the positive reinforcement learners receive. Students' motivation is strengthened When they experience fulfillment and pleasure in their learning activities, leading to better academic engagement.

These findings are supported by the study of Sheng and Weng (2024), who emphasized that effective instructional management plays a critical role in maintaining student satisfaction. Additionally, Ryan and Deci (2020) emphasize the importance of the self-determination theory, which is closely related to satisfaction. Students are more satisfied and motivated when they believe their requirements for competence, autonomy, and relatedness are being addressed. According to a study by Dunlap and Lowenthal (2018), fostering community and connection can also increase learner satisfaction. Similarly, Abuhassna et al. (2020) highlighted that student autonomy, background, and participation significantly influence Satisfaction in learning environments. The results affirm that incorporating meaningful feedback, enjoyable content, and learner-centered activities can create a more satisfying and motivating educational experience.

Table 6 Overall Level of Learners' Motivation in Terms of Attention, Relevance, Confidence, and Satisfaction.

	Presurvey			Postsurvey		
Variables	**Mean**	**SD**	**QD**	**Mean**	**SD**	**QD**
Attention	3.22	0.886	Moderately Motivated	3.94	0.815	Moderately Motivated
Relevance	3.45	0.945	Moderately Motivated	3.97	0.81	Motivated
Confidence	3.14	0.957	Moderately Motivated	3.86	0.812	Motivated
Satisfaction	3.57	0.849	Motivated	4.24	0.709	Highly Motivated
Overall Mean	3.35	0.909	Moderately Motivated	4.002	0.787	Motivated

Table 6 presents the overall level of learners' motivation as measured in the presurvey and postsurvey, using the four components of the ARCS instructional model: Attention, Relevance, Confidence, and Satisfaction. The table summarizes the mean scores, standard deviations (SD), and qualitative descriptions (QD) of learners' motivational levels. In the presurvey, the overall mean motivation was 3.35 with SD = 0.909, categorized as *Moderately Motivated*. After the intervention, the overall mean increased to 4.002 with SD = 0.787, shifting to the *Motivated* category.

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A closer examination of satisfaction components reveals meaningful improvements across all areas. Attention improved from 3.22 to 3.94, maintaining a *Moderately Motivated* category. Relevance increased from 3.45 to 3.97, shifting from *Moderately Motivated* to *Motivated*, indicating that students perceived greater significance and applicability of the lesson content. Confidence rose from 3.14 to 3.86, also moving from *Moderately Motivated* to *Motivated*, reflecting enhanced self-assurance in students' learning abilities. Satisfaction showed the most notable increase, from 3.57 from *Motivated* to *Highly Motivated*. The decreasing standard deviations from presurvey to post-survey suggest that learners' experiences became more consistent after exposure to the ARCS instructional model.

These findings demonstrate a positive shift in learners' motivation after the intervention, indicating that students became more focused, found greater Relevance in their studies, gained confidence in their abilities, and experienced Satisfaction in their learning journey. The substantial increase in Satisfaction is particularly significant, suggesting that students not only engaged with the content but also found joy and fulfillment, which is an important factor in sustaining long-term motivation and academic success. The observed improvements across all ARCS components highlight the effectiveness of motivational instructional strategies in fostering a more engaging and impactful learning environment. Learners' increased motivation levels across Attention, Relevance, and Confidence, and Satisfaction dimensions indicate that the intervention successfully created conditions conducive to deeper learning and higher academic engagement.

Additionally, verbatim answers from the student's post-interviews support the result above. An example would be, "I really find the science subject boring. But, because of the activities during the period, it makes learning science more interesting." "The given activities by the teacher and the way she discusses always keep us motivated." "The group activity, even though sometimes it was hard, because of teamwork and by helping one another, we are able to finish the task on time." "The videos presented by the teacher before the start of the discussion really help me a lot. It makes the discussion easier and makes us wonder how things work specifically in our hormones from Satisfaction to the menopausal stage of our lives."

These results are consistent with the findings of Li and Keller (2018), who emphasized that the ARCS model positively impacts students' motivation and academic performance. Considering the ARCS instructional model influences students' intention to participate in learning activities, educators would like to capitalize on the learning motivation (Liaw et al., 2019). Similarly, Chang et al. (2021) confirmed that all four constructs of the ARCS model achieved significant results in improving learners' motivation. Furthermore, Cardenas and Guerrero (2019) asserted that the ARCS model is effective across curricular areas, helping teachers inspire learners through structured motivational design. Motivation significantly influences student achievement (Kriegbaum et al., 2018).

Table 7 Paired T-Test Summary of the Academic Performance of Science 10 Learners When Exposed Before and After ARCS Instructional Model

Measure 1		Measure 2	Mean Difference	T	df	p	Cohen's d
Pretest Scores	-	Posttest Scores	-5.54	-6.012	38	<.001	1.103
**Significant at p<0.05 alpha level*							

The paired t-test results, as presented in Table 7, demonstrate the impact of the ARCS instructional model on the academic performance of Science 10 learners. The table compares explicitly pretest and posttest scores to evaluate the effectiveness of the instructional model. The results are shown through the mean difference between the scores, the t-value, degrees of freedom (df), the p-value, and Cohen's d-value. The data reveal a mean difference of -5.54 between the pretest and posttest scores, with a t-value of -6.012 and a p-value of less than 0.001, indicating a statistically significant improvement in students' scores after the intervention. Cohen's d value of 1.103 suggests a large effect size, confirming that the change in academic performance was statistically significant and practically meaningful.

The substantial increase in posttest scores signifies that the ARCS instructional model positively impacted the learners' academic achievement in Science 10. The negative mean difference implies that students performed considerably better after the intervention and the large effect size highlights the strength of the improvement. The findings suggest that integrating motivational strategies such as gaining Attention, establishing Relevance, building confidence, and promoting Satisfaction can effectively enhance learners' understanding and mastery of scientific concepts.

These results are consistent with previous studies that highlight the effectiveness of the ARCS model in improving student performance. Sharma and Arora (2019) emphasized that the ARCS instructional model is a highly effective strategy for increasing student interest and learning outcomes across various subjects. Subbiah (2024) further affirmed that ARCS-based instruction improves academic performance and student motivation, advocating its application across all disciplines. Ma and Lee (2021) also noted that while motivational strategies greatly enhance learner engagement, supplementary academic supports such as scaffolding are beneficial in ensuring that motivation translates into measurable academic gains. Overall, the findings support the conclusion that the ARCS instructional model is a practical and powerful approach to improving academic performance in science education.

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Table 8 Paired T-Test Summary of the Motivation of Science 10 Learners before and After Exposure to the ARCS Instructional Model

Measure 1		Measure 2	Mean Difference	t	df	p	Cohen's d
Pretest Attention	-	Posttest Attention	-.73	-12.225	39	<.001	2.41
Pretest Relevance	-	Posttest Relevance	-.52	-3.590	39	<.001	0.82
Pretest Confidence	-	Posttest Confidence	-.72	-9.009	39	<.001	1.92
Pretest Satisfactions	-	Posttest Satisfaction	-.66	-4.568	39	<.001	1.09
Pretest Overall	-	Posttest Overall	-.67	-9.152	39	<.001	2.11
**Significant at p<0.05 alpha level*							

The paired t-test results reveal that the ARCS instructional model had a statistically significant positive effect on learners' motivation across all four constructs. The p-values for Attention, Relevance, Confidence, Satisfaction, and Overall Motivation were all less than 0.05, indicating significant improvements following the intervention. These findings demonstrate that applying the ARCS model effectively enhanced learners' motivation by capturing their Attention, strengthening their perception of Relevance, increasing their self-confidence, and improving their overall Satisfaction with the learning experience.

The analysis of effect sizes using Cohen's d further supports these findings. Large effect sizes were observed for Attention (d = 2.41), Confidence (d = 1.92), and Overall Motivation (d = 2.11), indicating that the intervention had a profound impact on these dimensions of motivation. Satisfaction also exhibited a large effect size (d = 1.09), suggesting a substantial improvement. Meanwhile, Relevance registered a medium to large effect size (d = 0.82), reflecting a meaningful but comparatively more minor increase relative to the other constructs.

These findings are consistent with previous research emphasizing the significant role of the ARCS model in enhancing student motivation and academic performance. Xueli et al. (2025) found that applying the ARCS model substantially affected students' academic outcomes, reinforcing the critical relationship between motivation and learning objectives. Traditionally, academic performance has been predominantly linked to standardized test scores, often overlooking other influential factors such as emotional intelligence, which Martin et al. (2019) identified as a crucial component affecting academic success.

Similarly, Afjar et al. (2020) reported that the ARCS model significantly boosts learning motivation, translating to more productive classroom activities and enhanced engagement. Wu (2018) highlighted that effective teaching performance and cognitive outcomes are closely tied to educators' proficiency in employing motivational frameworks like the ARCS model, particularly through designing engaging and inspiring instructional materials.

Further evidence by Sabanal et al. (2023) supports these conclusions, as their study on science learners showed a high level of academic achievement and a generally substantial degree of motivation following the implementation of motivational strategies. Moreover, Pratama et al. (2019) emphasized that the ARCS model can substantially enhance students' learning motivation by integrating elements that directly appeal to learners' interests and needs. Dinçer (2020) also found that instructional materials structured around the ARCS framework had a moderate but meaningful impact on motivation, primarily by successfully capturing and maintaining student attention.

V. SUMMARY, FINDINGS

This section presents the summary, findings, and conclusions of the learners' academic performance and motivation in Science 10 exposed before and after the ARCS instructional model and further research recommendations.

➢ *Summary*

This study was conducted at the Philippine College Foundation-Basic Education Department. The study employed a one-shot pre-experimental research design to determine the academic performance and motivation in Science 10 before and after exposure to the ARCS instructional model.

In this study, the research instruments used were adapted from the ARCS model of motivation, developed by John Keller in 1993, and a 50-item researcher-made academic assessment. All instruments used were subjected to content validity and experts' validation.

Moreover, the researcher utilized descriptive statistics to determine the level of academic performance and students' motivation before and after exposure to the ARCS Instructional Model. Additionally, paired-sample T-tests were used to investigate whether a significant difference exists in students' academic performance after exposure to the ARCS instructional model.

➢ *Findings*

Based on the Collected and Treated Data, the Following Were the Foremost Findings of the Study:

- Implementing the ARCS Instructional Model in Science 10 class made notable progress in learners' academic performance.
- There is a significant improvement in learners' motivation level after exposure to the instructional model, as measured across the ARCS dimensions of Attention, Relevance, Confidence, and Satisfaction.
- The paired t-test results show that the learners' academic performance in Science 10 after exposure to the ARCS instructional model improved statistically significantly. These results show how well the ARCS instructional model improves academic performance by fostering an

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engaging atmosphere emphasizing focus, relevance, confidence, and satisfaction.

- The paired t-test results show that the ARCS Instructional Model significantly improved Science 10 learners' motivation across attention, relevance, confidence, and satisfaction, with large effect sizes indicating substantial and meaningful learning gains after the intervention.

VI. CONCLUSION

➢ *Based on the Findings of this Study, the Following Conclusions Were Drawn:*

- Implementing the ARCS instructional model can enhance learners' academic performance.
- Implementing the ARCS instructional model can enhance learners' motivation regarding attention, relevance, confidence, and satisfaction.
- Students' academic performance in Science 10 classes
- Significantly improved after the ARCS Instructional Model was implemented.
- The ARCS Instructional Model significantly improved Science 10 learners' motivation across attention, relevance, confidence, and satisfaction, confirming it as an effective strategy for enhancing engagement and supporting academic performance.

RECOMMENDATIONS

➢ *The Results of this Study Provide Information for Teaching and Learning Relevant to Science Education. Based on the Summary, Findings, and Conclusions, the Following Recommendations Were Presented:*

- Educators may integrate the ARCS instructional model into the science curriculum and other learning areas and grade levels to enhance students' academic performance and motivation.
- Teachers and administrators should provide support and focused attention to students who exhibit slight improvement to guarantee fair learning outcomes since there was evidence of variation in students' performance and conduct assessments regularly to track students' improvements, ensuring that teaching methods continue to be successful and flexible.
- School administrators may provide teacher training on implementing the ARCS instructional model to successfully apply it to the teaching-learning process through mentoring and coaching. Teachers should also participate in professional development programs emphasizing techniques to increase attention, relevance, confidence, and satisfaction.
- Future researchers should examine how the ARCS instructional model affects academic performance and motivation over the long run and how well it works in different disciplines and educational levels.
- The research design may be enhanced from a pre-experimental one-shot design to a quasi-experimental design in which experimental and controlled groups will be used.

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