

Learner's Perceptions of Group Work through the ARCS Motivational Model

^{*1}Shafiyah Mohamad Khalil, ²Noor Ahnis Othman, ³Musaddiq Mohamad Khalil, ⁴Zachariah Aidin Druckman, ⁵Farha Wahidah Bahrudin, ⁶Noor Hanim Rahmat

^{1,2,4,6}Akademi Pengajian Bahasa, Universiti Teknologi MARA, Shah Alam, Malaysia

³Fakulti Seni Lukis dan Seni Reka, Universiti Teknologi MARA, Melaka, Malaysia

⁵Sekolah Kebangsaan Sri Bukit Pasir, Muar, Johor, Malaysia

DOI: <https://doi.org/10.47772/IJRISS.2026.102100043>

Received: 10 July 2026; Accepted: 15 July 2026; Published: 24 July 2026

ABSTRACT

Group work is widely used in tertiary foreign-language classrooms, yet the motivational mechanisms that sustain learner engagement in group-based tasks remain under-examined. Drawing on Keller's ARCS motivational framework, the present study examined how foreign-language university learners perceive Attention, Relevance, Confidence, and Satisfaction in the context of group work, and tested whether these four components are significantly related and whether they vary across learner clusters. A quantitative cross-sectional survey design was employed. A convenience sample of 118 university students completed a 35-item, five-point Likert-scale instrument adapted from Keller, Studnicka, and Bateman et al. Instrument reliability was excellent (overall Cronbach's $\alpha = .985$; sub-dimension $\alpha = .942-.970$). Pearson correlations indicated strong, significant positive relationships among all four ARCS factors ($r = .762-.948$, all $p < .001$), supporting the alternative hypothesis that the four components function as a coherent motivational cluster. Cluster-level comparisons, however, revealed no significant differences across learner groupings (all $F < 1$, $p > .05$), supporting the null hypothesis of no cluster variation. Findings suggest that ARCS-based interventions in tertiary foreign-language group work should treat the four dimensions as interrelated rather than independent, while remaining sensitive to within-group homogeneity in motivational response.

Keywords: ARCS model; group work; motivation; foreign-language learning; Keller

INTRODUCTION

Group work has long occupied a central place in tertiary foreign-language pedagogy, valued for its potential to extend authentic communicative practice beyond teacher-led instruction and to scaffold learners' interlanguage development through peer interaction (Ibrokhimovna, 2023; Rahmat, 2025). Recent accounts emphasise that the social and interactional richness of group work in foreign-language (FL) classrooms also creates a distinctive motivational ecology—one in which learners' engagement depends not only on the group's instructional design but also on the perceived cognitive, affective, and social conditions of the activity itself. Motivation propels an individual towards achieving a preset goal, and students are no different; they rely heavily on it to achieve learning goals. Each student's motivation is unique and influenced by various aspects of their study environment (Julianingsih et al., 2023). Generally, motivation can be classified into two categories: intrinsic and extrinsic. Intrinsic motivation is the drive to act or attain success that comes from within oneself, versus extrinsic motivation, in which motivation is triggered by things outside the individual, such as material rewards. Thus, understanding students' motivation enables teachers to prepare effective lessons and conducive learning environments.

Teachers are often faced with the challenge of designing lessons that elicit or improve students' motivation to learn. The ARCS theory is the result of John Keller's determination to develop a motivational theory or model to guide teachers in designing lessons that motivate students to learn and sustain their interest in learning (Keller,

1979, 1987). The Attention, Relevance, Confidence, and Satisfaction model known as the ARCS model of motivation was founded by Keller (1987), to help instructors find the major factors of student motivation and as a systematic path to identify and solve issues regarding learning motivation. One of the methods commonly employed by language teachers to foster collaborative learning and teamwork among students is group work (Zhou & Zhang, 2025). It allows students to learn collaboratively and interact meaningfully with each other, hence promoting language acquisition. This method of teaching is interactive and student-centered, as teachers serve as facilitators and students have the opportunity to exchange ideas and apply the language through group discussions and role-plays (Ibrokhimovna, 2025).

Keller's (1979;1987) ARCS model of motivation offers a parsimonious framework for systematically describing those conditions. The model posits that sustained learner motivation rests on four interrelated components: Attention (the perceptual and cognitive arousal learners feel toward a task), Relevance (the perceived connection between the task and learners' goals, prior knowledge, or social context), Confidence (the learners' sense that they can succeed given appropriate scaffolding), and Satisfaction (the internal and external reinforcements that consolidate motivation). Originally developed as an instructional-design framework, ARCS has been increasingly applied to language-learning settings (Bateman et al., 2002; Studnicka, 2023), and recent meta-analytic evidence confirms that ARCS-based interventions produce large effects on learning achievement in technology-mediated, short-cycle designs.

Despite this growing literature, relatively little quantitative work has examined ARCS in the specific context of group work in foreign-language classrooms, and in particular whether the four components function as a coherent motivational cluster or operate independently in such settings. The present study addresses this gap. Specifically, it asks:

1. RQ1 — Are Attention, Relevance, Confidence, and Satisfaction significantly related to one another when learners evaluate their group-work experiences in foreign-language learning?
2. RQ2 — Are there significant differences in ARCS factor scores across learner clusters?

Based on these questions, two hypotheses were tested:

- H₁: There is a significant positive relationship among the four ARCS factors in foreign-language learning.
- H₂: There is no significant difference in ARCS factor scores across learner clusters.

The expectation under H₁ was that learners who perceive their group work as arousing attention would also perceive it as relevant, confidence-building, and satisfying — consistent with the conceptual interdependence implied by Keller's framework. The expectation under H₂ was that ARCS perceptions would not vary by cluster membership, given that learners within a single institutional context often share common motivational profiles.

LITERATURE REVIEW

ARCS Model of Motivation (Keller, 1979) and Motivation to Learn a Foreign Language

Keller began his quest in 1979 to identify a theory or model to support motivational learning and eventually founded the Attention- Relevance- Confidence- Satisfaction model known as the ARCS model of motivation, which is grounded in expectancy-value theory; deriving from the works of Tolman (1932 as cited in Keller, 1987) and Lewin (1938 as cited in Keller, 1987). According to Keller (2010), the ARCS model of motivation was developed to guide instructors in identifying the core factors of student motivation and to address issues affecting students' motivation to learn. The motivational model known as ARCS comprises four aspects— Attention, Relevance, Confidence and Satisfaction. The model is designed to assist teachers and instructors in creating lessons that stimulate and sustain students' interest in learning (Keller, 1979; Xueli et al., 2024).

The first component of the ARCS model is Attention—the initial drive for students' interest in language learning. In particular, Attention draws students' attention and increases engagement in learning the language. The second component is Relevance—the bridge to deep learning and increased motivation. This is because learners at this

stage are able to relate the use of the acquired language to their prior knowledge and future goals, hence finding relevance in using the language as a tool for social interaction. The third component is Confidence—learners gain confidence in using the language through support from instructors and/or peers. At this stage, learners' anxiety decreases as they feel supported, and increased output in the acquired language becomes evident. The fourth and final component is Satisfaction—the strongest indicator of learners' ability to use the language and, in turn, sustains their motivation to acquire it. During this last stage, learners feel a sense of satisfaction as they perceive themselves as capable of using the acquired language and take ownership of their motivation to improve their ability in using it.

Thus, the ARCS model of motivation by Keller (1979) provides a systematic framework for language teachers to design lessons that foster intrinsic motivation in language learners, including ESL and EFL learners, to gradually become self-motivated.

Sociocultural theory and Group Work

Vygotsky (1978) established the sociocultural theory (SCT), which highlights learners' social interactions and cultural backgrounds as integral to their learning, development, and cognitive growth. SCT, through the lens of Vygotsky, posits that motivation is not entirely an internal process but rather a socially mediated process since learners acquire language by using it to interact with others and, in turn, improve their language skills through social interaction. Vygotsky proposes that learners go through three stages of language development. First, learners make their own meaning of the language and use it to learn successfully. Second, learners apply the language through social interaction, problem-solving, and engagement with other language learners. Third, learners reach the Zone of Proximal Development (ZPD)—the gap between what learners can achieve on their own and what they can gain with support. Hence, Vygotsky holds that learners achieve more when working in groups than when working alone, because real learning occurs in the ZPD.

Recently, many foreign-language (FL) classes have shifted from traditional teacher-transmitted knowledge to a socially interactive journey, promoting student-centered learning that promotes teacher-student interaction and collaborative learning (Zhou & Zhang, 2025). Teamwork and cooperation among learners are fostered through group projects, peer discussions, and problem-solving tasks that enhance language development, critical thinking, and learners' autonomy. According to Ibrokhimovna (2023), collaborative learning in group work enables learners to scaffold each other's understanding of the FL, leading to deeper linguistic and cultural competence. Learners benefit from the interaction, shared knowledge and cultural environment within their study group (Rahmat, 2025). Vygotsky's (1978) sociocultural theory highlights that group work is the principal site where learners operate within the zone of proximal development, and teachers can apply the ARCS model to motivate learners and sustain their interest in the FL.

Past Studies on Motivation and Self-Confidence in Learning a Foreign Language

Kouraichi (2026) employed a mixed-methods study to identify the motivational strategies used by Tunisian EFL university teachers and to explore the effectiveness of these strategies as perceived by students. A total of 264 undergraduates and 46 EFL teachers from ten universities in Tunisia participated in the questionnaire and were followed by observations of 21 teachers' classrooms. The questionnaire was developed from Keller's ARCS motivational model, and the study's findings revealed that teachers and students held different perspectives on the type of motivation used in the teaching and learning process. Teachers reported using confidence-building strategies in their lessons, whereas students' feedback and observation results showed that relevance-based strategies were used more frequently in the classroom.

Studnicka (2023) similarly agrees with Keller (1987) that what motivates learners is their confidence and the satisfaction they derive from learning. Bateman et al. (2002) argue that successful group work arises when team members pay attention to purpose and goals, hold well-defined roles, and engage in well-planned team processes; the relevance of the interaction is internalised through team relationships, inter-group relations, and passion and commitment, while confidence and satisfaction reinforce continued engagement. Kouraichi (2026) also noted that although group activities were used in the observed EFL classrooms, they were utilised to simplify

assignments and encourage collaboration among students, suggesting that team competition may be less prevalent among tertiary students than among high school students.

Taken together, this body of work suggests that the four ARCS components should operate as a coherent motivational cluster in group-based FL learning — a hypothesis the present study puts to empirical test.

Conceptual Framework of the Study

Figure 1 below presents the study's conceptual framework. This study explores group work in learning a foreign language using the ARCS theory by Keller (1979). According to Keller (1979), the ARCS model of motivation comprises four main factors: (a) attention, (b) relevance, (c) confidence and (d) satisfaction. This model describes learners' learning experience that stimulates interest in learning.

There are many advantages to group work activities in learning a foreign language. According to Rahmat (2020), learners gain knowledge by completing the given tasks. The interaction helps to improve team members' communication skills. Keller (1979) states that learners' motivation depends on the attention they give to the learning and how relevant they consider the learning outcome to be to them. Similarly, Bateman et.al. (2002) states that successful group work comes from team members who pay attention to their purpose & goals, well-defined roles for team members, and well-planned team processes that encourage acquisition of skills and learning. Next, team members need to internalise the relevance of the interaction through team relationships and inter-group relations, and demonstrate passion and commitment. In addition to that, Studnicka (2023) also agrees with Keller (1979) that what motivates learners is their confidence and how much satisfaction they (the learners) gain from learning. This study also explores the relationships among all factors in ARCS for group work in learning a foreign language.

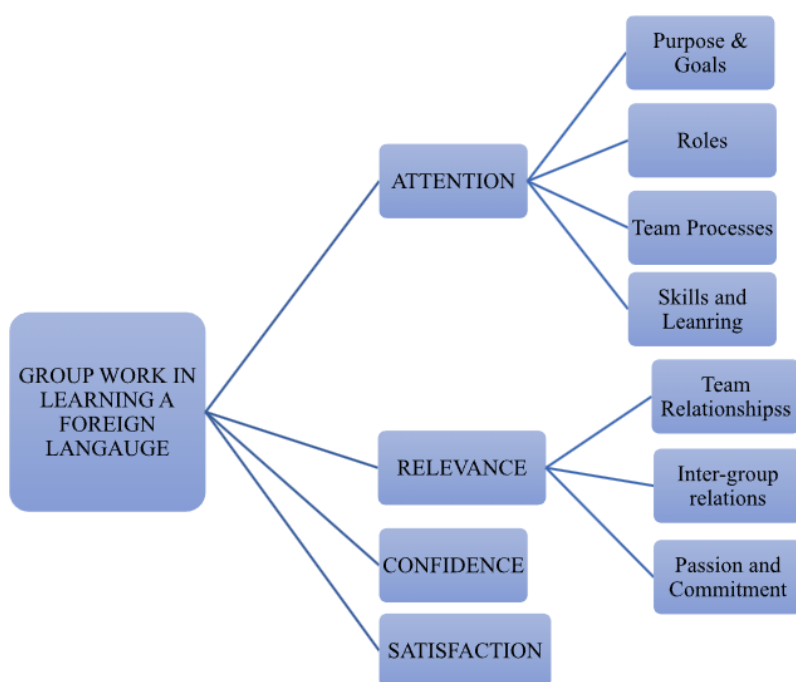


Figure 1- Conceptual Framework of the Study

Learner's Perceptions of Group Work Through the ARCS Motivational Model

METHODOLOGY

This quantitative study is conducted to explore learner's perceptions of group work through the ARCS motivational model. A convenient sample of 118 university students recruited through a convenience-sampling procedure at a Malaysian higher-education institution. Participation was voluntary and anonymous.

The instrument used is a questionnaire that consisted of 35 items, answered on a five-point Likert scale (1 = strongly disagree; 2 = disagree; 3 = undecided; 5 = strongly agree), and was adapted from Keller (1979), Studnicka (2023), Bateman et al. (2002). Items were organised across the four ARCS components, with the following sub-constructs and reliability coefficients:

Table 1 Distribution of Items in the Survey

SECTION	Factors in ARCS model	Construct	Item	Total Items	Cronbach Alpha
B	Satisfaction	Satisfaction with Current Learning	5	5	.942
C	Confidence	Self-Confidence in Learning	8	8	.946
D	Attention	Purpose and Goals (PG)	3	12	.961
		Roles (R)	3		
		Team Processes (TP)	3		
		Skills and Learning (SL)	3		
E	Relevance	Team Relationships (TR)	4	10	.970
		Intergroup Relations (IR)	3		
		Passion and Commitment (PC)	3		
				35	.985

Table 1 shows the distribution of items in the survey. This study is based on Keller's (1979) ARCS theory of motivation, and the instrument is adapted from Keller (1979), Studnicka (2023), and Bateman et al. (2002) to reveal the variables in the table above. Section B has 5 items for Satisfaction. Section C has 8 items for Confidence. Section D has 9 items for Attention and Section E has 13 items for Relevance. Overall, there are 35 items.

Table 2 Reliability Levels, Cronbach's Alpha Ranges, and Their Interpretations

Reliability Level	Cronbach's Alpha range	Interpretation
Excellent	0.9 and above	Indicates very high internal consistency
Good	0.80-0.89	Reflects strong internal consistency
Acceptable	0.70-0.79	Indicates acceptable internal consistency
Questionable	0.60-0.69	Reflects questionable internal consistency
Poor	Below 0.6	Indicates poor internal consistency

To determine the instrument's internal reliability, one can conduct a reliability analysis. Table 3 above shows the distribution and interpretation of the Cronbach Alpha range. According to Ahmad et al. (2024), Cronbach Alpha scores between 0.7 and 0.9 are considered acceptable to excellent. The 35-item, five-point Likert-scale instrument yielded 118 complete responses with no missing data on the ARCS components. Subscale reliabilities were excellent ($\alpha = .942-.970$), supporting the use of composite scores.

FINDINGS AND DISCUSSION

Demographic Analysis

According to Ziegenfuss et al. (2021), researchers report demographic data as percentages to assess sample representativeness and facilitate generalizability to a larger population. The reporting also provides an overview of participants' characteristics. Percentages offer a clear and understandable picture of the sample makeup.

Table 3 Percentage for Demographic Profile

Question	Demographic Profile	Categories	Percentage
1	Gender	Male	32%
		Female	68%
2	Cluster	Science & Technology	14%
		Social Sciences & Humanities	86%

With reference to Table 3, from 118 participants who responded to the survey, 32% of them were male, and 68% were female. The respondents' cluster of studies were divided into two; 14% of them from Science & Technology and 86% from Social Sciences & Humanities.

RQ1 — Are Attention, Relevance, Confidence, and Satisfaction significantly related to one another when learners evaluate their group-work experiences in foreign-language learning?

Descriptive Statistics

Why is it necessary to report the mean and standard deviation? According to Vetter (2017), the mean (M) represents the average, or centre of a data set. Standard deviation (SD) indicates the typical distance of individual observations from the mean, which shows the data's variability or spread. A low SD means the data points are clustered close to the mean, while a high SD means they are more dispersed.

Findings for Attention, Relevance, Confidence and Satisfaction

Attention

Table 4 Mean for Purpose and Goals (PG)

ITEM	Mean	SD
PGQ1 Our team has a meaningful, shared purpose.	4.41	0.74
PGQ2 We are strongly committed to a shared mission.	4.41	0.72
PGQ3 We set and meet challenging goals.	4.43	0.76

With reference to Table 4 Mean for Purpose and Goals (PG), Item PGQ3 (mean=4.43, SD=0.76) had the highest mean, which shows that learners perceived attention through purpose and goals by making sure to set and meet challenging goals for their team. Next, Item PGQ2 (mean=4.41, SD=0.72) indicates that the members were strongly committed to their team's shared mission. Finally, Item PGQ1 (mean=4.41, SD=0.74) had the lowest mean, reflecting their perception that the team has a meaningfully shared purpose.

Table 5 Mean for Roles (R)

ITEM	Mean	SD
RQ1 Team members clearly understand their roles.	4.40	0.73
RQ2 When an individual's role changes, an intentional effort is made to clarify it for everyone on the team.	4.36	0.76
RQ3 Everyone values what each member contributes to the team.	4.41	0.75

With reference to Table 5 Mean for Roles (R), Item RQ3 (mean=4.41, SD=0.75) showed the highest mean, indicating that learners perceived roles such that each team member's contribution was valued by all members. Next, Item RQ1 (mean=4.40, SD=0.73) indicates that team members clearly understood their roles. Finally, Item RQ2 (mean=4.36, SD=0.76) showed the lowest mean, indicating that when there was a shift in an individual's role in the team, an intentional effort was made to clarify it for everyone in the group.

Table 6 Mean for Team Processes (TP)

ITEM	Mean	SD
TPQ1 We address and resolve issues quickly.	4.33	0.79
TPQ2 Our team works with a great deal of flexibility so that we can adapt to changing needs.	4.36	0.70
TPQ3 When we choose consensus decision-making, we do it effectively.	4.16	0.77

With reference to Table 6 Mean for Team Processes (TP), Item TPQ2 (mean=4.36, SD=0.70) had the highest mean, indicating that learners perceived attention through team processes by ensuring the team worked with a significant degree of flexibility to adapt to changing needs. Next, Item TPQ1 (mean=4.33, SD=0.79) indicates that team members promptly addressed and resolved issues within the team. Finally, Item TPQ3 (mean=4.16, SD=0.77) had the lowest mean, indicating that when team members choose consensus decision-making, they do so effectively.

Table 7 Mean for Skills and Learning (SL)

ITEM	Mean	SD
SLQ1 We have the skills we need to do our jobs effectively.	4.35	0.78
SLQ2 We view everything, even mistakes, as opportunities for learning and growth.	4.42	0.70
SLQ3 Team members embrace continuous improvement as a way of life.	4.42	0.72

With reference to Table 7 Mean for Skills and Learning (SL), Item SLQ2 (mean=4.42, SD=0.70) showed the highest mean, which indicated that learners perceived attention through skills and learning by viewing everything, including mistakes as opportunities for learning and development. Next, Item SLQ3 (mean=4.42, SD=0.72) showed that team members embraced continuous improvement as part of skills and learning. Finally, Item SLQ1 (mean=4.35, SD=0.78) showed the lowest mean, indicating learners' perception of having the required skills to carry out their tasks effectively.

Relevance

Table 8 Mean for Team Relationships (TR)

ITEM	Mean	SD
TRQ1 Team members appreciate one another's unique capabilities.	4.48	0.66
TRQ2 Team members are effective listeners.	4.44	0.71
TRQ3 Communication in our group is open and honest.	4.3	0.71
TRQ4 Members of our team trust each other.	4.41	0.74

With reference to Table 8 Mean for Team Relationships (TR), Item TRQ1 (mean=4.48, SD=0.66) had the highest mean, indicating that learners' perception of relevance in team relationships is that team members appreciate each other's unique capabilities. Next, Item TRQ2 (mean=4.42, SD=0.71) indicates that team members perceived their teammates as effective listeners. Then, Item TRQ4 (mean=4.41, SD=0.74) displays that team members trusted each other. Finally, Item TRQ3 (mean=4.3, SD=0.71) had the lowest mean, which presented the perception of learners on open and honest communication in their group.

Table 9 Mean for Intergroup Relations (IR)

ITEM	Mean	SD
IRQ1 We are able to resolve conflicts with other teams collaboratively.	4.40	0.73
IRQ2 We communicate effectively with other groups.	4.42	0.74
IRQ3 Our collaborations with other teams are productive, worthwhile, and yield good results.	4.47	0.69

With reference to Table 9 Mean for Intergroup Relations (IR), Item IRQ3 (mean=4.47, SD=0.69) had the highest mean, which reveals learners' perception of relevance through intergroup relations, in which they view collaborations with other teams as productive, worthwhile and yielding good results. Next, Item IRQ2 (mean=4.42, SD=0.74) assesses students' understanding of whether their team communicated effectively with other groups. Finally, Item IRQ1 (mean=4.40, SD=0.73) had the lowest mean, indicating students' perception that their team could resolve conflicts with other teams collectively.

Table 10 Mean for Passion and Commitment (PC)

ITEM	Mean	SD
PCQ1 Working on our team inspires people to do their best.	4.47	0.69
PCQ2 People are proud to be part of our team.	4.38	0.76
PCQ3 My team is proud of its accomplishments and optimistic about our work.	4.43	0.73

With reference to Table 10 Mean for Passion and Commitment (PC), Item PCQ1 (mean=4.47, SD=0.69) had the highest mean, which reveals that learners' perception of relevance in terms of passion and commitment is that working on their team inspired each team member to give their utmost effort. Next, Item PCQ3 (mean=4.43, SD=0.73) indicated that students perceive their team as proud of its accomplishments and optimistic about its work. Finally, Item PCQ2 (mean=4.38, SD=0.76) had the lowest mean, indicating that the students were all proud to be part of their team.

Confidence

Table 11 Mean for Self-Confidence in Learning (L)

ITEM	Mean	SD
LQ1 I am confident that I am mastering the class role-play/activity presented to me by my instructors.	4.15	0.81
LQ2 I am confident that this role play/activity covered the essential content necessary to master the material covered in the curriculum.	4.25	0.80
LQ3 I am confident that I am developing the skills and gaining the required knowledge from this role play/activity to perform the necessary tasks in my course.	4.25	0.77
LQ4 My instructors used a variety of helpful resources to teach this role play/activity.	4.34	0.74
LQ5 It is my responsibility as a student to learn what I need during role play /activity classes.	4.42	0.73
LQ6 I know how to get help when I do not understand the concepts in the role play/activity.	4.32	0.81
LQ7 I know how to use role play exercises to learn the critical/key aspects of this course.	4.23	0.87
LQ8 It is the instructor's responsibility to show me what I need to learn during the role play /activity in class.	4.52	0.75

With reference to Table 11, Mean for Self-Confidence in Learning (L), Item LQ8 (mean=4.52, SD=0.75) showed the highest mean, which indicated that learners' perception of self-confidence in learning is that it is the instructor's responsibility to show them what they need to learn during their role play or class activity. Next, Item LQ5 (mean=4.42, SD=0.73) reflects students' perception that it is their responsibility as students to learn what they need to do during role-plays or class activities. Finally, Item LQ1 (mean=4.15, SD=0.81) had the lowest mean, indicating learners' confidence in mastering the class role-play or activity presented to them by their instructors.

Satisfaction

Table 12 Mean for Satisfaction with Current Learning (CL)

ITEM	Mean	SD
CLQ1 The methods used in this role play /activity were supportive and effective.	4.37	0.76
CLQ2 The role play /activity provided me with a variety of educational materials and activities to promote my learning.	4.37	0.79
CLQ3 I liked the way my instructor taught me the role play /activity.	4.51	0.70
CLQ4 The teaching materials used in this role play /activity were motivating and helped me learn.	4.41	0.79
CLQ5 The way my instructor taught the role play /activity was appropriate to my way of learning.	4.48	0.77

With reference to Table 12 Mean for Satisfaction with Current Learning (CL), Item CLQ3 (mean=4.51, SD=0.70) had the highest mean, which reveals that the learners were satisfied with the way their instructor taught them the role play or activity. Next, Item CLQ5 (mean=4.48, SD=0.77) indicates that learners perceived the method their instructor used to teach the role play or activity as appropriate, to match their learning style. Finally, Item CLQ2 (mean=4.37, SD=0.79) had the lowest mean, indicating the learners' perceived satisfaction with the

role play or activity for providing them with a variety of educational materials and activities to promote their learning.

RQ2 — Are there significant differences in ARCS factor scores across learner clusters?

- *H₁: There is a significant positive relationship among the four ARCS factors in foreign-language learning.*
- *H₂: There is no significant difference in ARCS factor scores across learner clusters.*

Inferential Statistics (significant difference)

According to He (2024), there are three main functions of a T-test and ANOVA. Firstly, both are done to compare means. This test is also done to determine if the average scores (mean) or values of two groups, or one group against a known value, are different enough to be considered statistically meaningful and are not just due to random chance. Secondly, t-tests and ANOVA are done to test hypotheses. Researchers use t-tests and ANOVA to test hypotheses about means, such as whether a new treatment significantly impacts a variable or if there's a difference in performance between two distinct groups. Lastly, t-tests and ANOVA are done to identify significant differences. The output of a t-test provides a p-value (significance value). If this p-value is below a predetermined threshold (often 0.05), it indicates a statistically significant difference, allowing researchers to draw conclusions about the populations from which their samples were drawn.

Findings for all factors across clusters

(H2-There is no significant difference for all factors across clusters)

Table 13 T-test for Significant Difference for All Factors Across Clusters

Independent Samples Test											
		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	t	df	Significance		Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						One-Sided p	Two-Sided p			Lower	Upper
ATTENTION	Equal variances assumed	.855	.357	-.281	116	.390	.779	-.04929	.17551	-.39690	.29832
	Equal variances not assumed			-.258	18.933	.400	.799	-.04929	.19088	-.44891	.35033
RELEVANCE	Equal variances assumed	.833	.363	-.213	116	.416	.832	-.03601	.16940	-.37153	.29951
	Equal variances not assumed			-.197	19.024	.423	.846	-.03601	.18278	-.41854	.34651
CONFIDENCE	Equal variances assumed	.182	.671	.145	116	.443	.885	.02619	.18093	-.33216	.38455
	Equal variances not assumed			.145	20.012	.443	.886	.02619	.18081	-.35095	.40334
SATISFACTION	Equal variances assumed	.114	.736	-.481	116	.316	.631	-.08922	.18543	-.45648	.27805
	Equal variances not assumed			-.463	19.486	.324	.648	-.08922	.19261	-.49167	.31324

With reference to Table 13, a T-test was conducted to examine the effects of all factors across clusters. The analysis shows there is no significant difference for attention (F=0.855, p=0.779), relevance (F=0.833,p=0.832), confidence (F=0.182, p=0.855), and satisfaction (F=0.114,p=0.631) across clusters.

Exploratory Statistics

According to He (2024), correlation is a statistical technique that shows how strongly two variables are related, or the degree of association between them. It's a common tool for describing simple relationships without making a statement about cause and effect. This section presents data to answer research questions on correlation.

Findings for Relationships between all factors in ARCS for foreign language learning

(H1- There is no relationship between all factors in ARCS for foreign language learning)

In order to determine whether there is a significant association in mean scores across all factors in ARCS for foreign language learning, data are analysed using SPSS to compute correlations among Attention and Relevance, Relevance and Confidence, and Confidence and Satisfaction. Results are presented separately in Table 14 below.

Table 14 Correlation between all factors in ARCS for foreign language learning

		ATTENTION	RELEVANCE	CONFIDENCE	SATISFACTION
ATTENTION	Pearson (Correlation	1	.948**	.850**	.816**
	Sig (2-tailed)		<.001	<.001	<.001
	N	118	118	118	118
RELEVANCE	Pearson (Correlation	.948**	1	.851**	.762**
	Sig (2-tailed)	<.001		<.001	<.001
	N	118	118	118	118
CONFIDENCE	Pearson (Correlation	.850**	.851**	1	.801**
	Sig (2-tailed)				
	N	118	118	118	118
SATISFACTION	Pearson (Correlation	.816**	.762**	.801**	
	Sig (2-tailed)	<.001	<.001	<.001	
	N	118	118	118	118

**Correlation is significant at 0.01 level (2-tailed)

Attention and Relevance

Table 14 shows there is an association between attention and relevance. Correlation analysis shows that there is a highly significant association between attention and relevance ($r=.948^{**}$) and ($p=.000$). According to He (2024), the coefficient is significant at the .05 level, and a positive correlation is measured on a 0.1 to 1.0 scale. A weak positive correlation would be in the range of 0.1 to 0.3, a moderate positive correlation from 0.3 to 0.5, and a strong positive correlation from 0.5 to 1.0. This means that there is also a strong positive relationship between attention and relevance. The null hypothesis is rejected.

Relevance and Confidence

Table 14 also shows there is an association between relevance and confidence. Correlation analysis shows that there is a highly significant association between relevance and confidence ($r=.851^{**}$) and ($p=.000$). According to He (2024), the coefficient is significant at the .05 level, and a positive correlation is measured on a 0.1 to 1.0 scale. Weak positive correlation would be in the range of 0.1 to 0.3, moderate positive correlation from 0.3 to

0.5, and strong positive correlation from 0.5 to 1.0. This means that there is also a strong positive relationship between relevance and confidence. The null hypothesis is rejected.

Confidence and Satisfaction

Lastly, Table 14 also shows there is an association between confidence and satisfaction. Correlation analysis shows that there is a highly significant association between confidence and satisfaction ($r=.801^{**}$) and ($p=.000$). According to He (2024), the coefficient is significant at the .05 level, and a positive correlation is measured on a 0.1 to 1.0 scale. A weak positive correlation would be in the range of 0.1 to 0.3, a moderate positive correlation from 0.3 to 0.5, and a strong positive correlation from 0.5 to 1.0. This means that there is also a strong positive relationship between confidence and satisfaction. The null hypothesis is rejected.

CONCLUSION

All in all, the finding that all six pairwise correlations among ARCS components are strong and statistically significant suggests that, in this sample, the four components do not operate as independent dimensions but as a coherent motivational cluster. Learners who experienced heightened attention during group work also found the activity relevant, confidence-building, and satisfying — a pattern consistent with Keller's conceptualisation of ARCS as an integrated motivational system.

The rejection of the null hypothesis H_1 thus supports the theoretical expectation that ARCS components are interrelated rather than discrete. At the same time, the absence of significant cluster-level differences (H_2 retained) suggests that this coherent ARCS profile is shared across learner subgroups. Within a single institutional context, motivational responses to group work may therefore be more uniform than heterogeneous — a finding with practical relevance for instructors designing ARCS-embedded group activities.

These results align with the broader ARCS literature. Wang Xueli et al. (2024) reported a large overall effect of ARCS on learning achievement (meta-analytic $SMD = 1.256$) but also showed that the effects are highly conditional on setting and design. The present study extends this picture by demonstrating that, at the perceptual level within a single FL context, ARCS components are tightly interrelated — supporting the framework's coherence. Kouraichi (2026) similarly observed that teacher-applied motivational strategies cluster around relevance-enhancing activities in EFL classrooms; the present data echo this asymmetry, with the Attention–Relevance correlation ($r = .948$) markedly stronger than those of other component pairs.

Implications and Suggestions for Future Research

In terms of theoretical and conceptual implications, the strong inter-factor correlations suggest that ARCS operates as a motivational system rather than as four independent levers in FL group-work contexts. Future theoretical work should treat the components as analytically separable but empirically coupled, and instruments should be designed with this coupling in mind (e.g., confirmatory factor analysis rather than treating each component as orthogonal).

As for pedagogical implications, instructors designing group work in FL classrooms should sequence motivational supports to leverage the strong Attention–Relevance coupling — for instance, beginning group tasks with explicit attention-gainers that frame the activity's relevance — while maintaining distinct scaffolds for Confidence (low-stakes rehearsal) and Satisfaction (peer acknowledgement, milestone recognition), which relate to Attention and Relevance somewhat less tightly.

Last but not least, the limitation to this study is the convenience sample ($N = 118$), single-institution scope, and cross-sectional design which limits generalisability. The very high inter-factor correlations raise concerns about potential multicollinearity; future studies should examine this with confirmatory factor analysis. Hence, this study recommends longitudinal designs, tracking ARCS trajectories over a full semester which would clarify whether the strong inter-factor coupling observed here is stable or shifts as group work matures.

ACKNOWLEDGEMENTS

The researchers would like to thank the participants of this study for their valuable feedback. In addition, the researchers would also like to express their deepest gratitude to family, friends and colleagues for the immense support and encouragement shown throughout the course of this study.

REFERENCES

1. Ahmad, N., Alias, F.A., Hamat, M., & Mohamed, S.A. (2024). Reliability Analysis: Application of Cronbach's Alpha in Research Instruments. SIG: e-Learning@CS, 114-119. <https://appspenang.uitm.edu.my/sigcs/>
2. Bateman, B., Colin Wilson, F., Bingham, D. (2002). Team effectiveness-development of an audit questionnaire. Journal of Management Development, 21(3), 215-226.
3. He, L. (2024). The Application of SPSS Correlation Analysis in the Study of Precision Teaching of English in Universities. Applied Mathematics and Nonlinear Science, 9(1), 1-13. <http://dx.doi.org/10.2478/amns-2024-1371>
4. Ibromkhimovna, A. M. (2025). Sociocultural Theory And Collaborative Learning In English As A Foreign Language (EFL) Context. The Best Intellectual Research, 54(1), 193-199. <http://journalss.org/index.php/luch/article/view/2153/2021>
5. Julianingsih, E., Retnowati, E., & Thoe Ng, K. (2023). A Worked Example Design with ARCS Motivational Model. Learning Science and Mathematics, 18, 32-45. http://recsam.edu.my/sub_lsmjournal/images/docs/2023/2023_3_EJ_3245.pdf
6. Keller, J. M. (1979). Motivation and instructional design: A theoretical perspective. Journal of Instructional Development, 2(4), 26-34. <https://www.jstor.org/stable/30220576>
7. Keller, J.M. (1987). Development and use of the ARCS model of instructional design. Journal of Instructional Development 10, 2-10. <https://doi.org/10.1007/BF02905780>
8. Keller, J.M. (2010). The Arcs Model of Motivational Design. In: Motivational Design for Learning and Performance. Springer, Boston, MA. https://doi.org/10.1007/978-1-4419-1250-3_3
9. Kouraichi, B. (2026). The use of motivational strategies: Perspectives of Tunisian EFL teachers and students. European Journal of Applied Linguistics, 14(1), 62-77. <degruyterbrill.com/document/doi/10.1515/eujal-2025-0005/pdf>
10. Rahmat, N.H. (2020). Conflict Resolution Strategies in Class Discussions. International Journal of Education, 12(3), 49-66. <https://www.macrothink.org/journal/index.php/ije/article/view/16914>
11. Rahmat, N. H. (2025). Exploring Interactions in Pair Work through Social Constructivism. International Journal of Academic Research in Business & Social Sciences, 15(6), 398-408. <http://dx.doi.org/10.6007/IJARBS/v15-i6/25683>
12. Studnicka, K., Zarzycka, D., and Zalewski, J. (2023). Student satisfaction and self-confidence in learning scale (SSCL)-reliability and validity test of the Polish version. Signa Vitae. 2023; 19(5): 104-111. doi: 10.22514/sv.2023.069.
13. Vetter, T.R. (2017). Descriptive Statistics: Reporting the Answers to the 5 Basic Questions of Who, What, Why, When, Where, and a Sixth, So What? Anesth Analg, 125(5), 1797-1802. <https://doi.org/10.1213/ane.0000000000002471>
14. Vygotsky, L. S. (1978). Mind in Society: The Development of Higher Psychological Processes. Harvard University Press.
15. Xueli, W., Md, Z. M. M., & Peipei, T. (2024). The Effect of the Arcs Model of Motivation on Students' Learning Achievement: A Meta-Analysis. Journal of Lifestyle and SDGs Review 5(2), 1-25. <https://doi.org/10.47172/2965-730X.SDGsReview.v5.n02.pe03220>
16. Zhou, Q., & Zhang, H. (2025). Flipped Classroom Teaching and ARCS Motivation Model: Impact on College Students' Deep Learning. Education Sciences, 15(4), 517. <https://doi.org/10.3390/educsci15040517>
17. Ziegenfuss, J. Y., Casey A. E., Jennifer M. D., Meghan M. J., Thomas E. K., and Marna, C. (2021). Impact of Demographic Survey Questions on Response Rate and Measurement: A Randomized Experiment. Survey Practice 14 (1), <https://doi.org/10.29115/SP-2021-0010>