



Developing L2 Speaking Fluency in Online Learning Through Two Motivation-Based Instructional Frameworks

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Abstract

While second/foreign language (L2) speaking fluency is essential for effective communication, fostering it in distance online education settings continues to pose substantial challenges. This study sought to examine the effectiveness of two motivation-based instructional frameworks/models, namely the ARCS-based and L2MSS vision-inspired models, in promoting L2 speaking fluency in an online learning context. In doing so, 61 upper-intermediate L2 (English) learners in three intact classes, chosen based on convenience sampling, were divided into two experimental groups and one control group. The experimental groups received instruction based on the ARCS (Attention, Relevance, Confidence, and Satisfaction) and L2MSS (Second Language Motivational Self System) frameworks, while the control group received conventional teaching. The three groups were pretested and posttested through structured interviews, with the resulting data imported into PRAAT software. The non-parametric test results revealed significant differences, with the ARCS and L2MSS groups outperforming the control group on speaking fluency measures such as the number of silent pauses and articulation rate. The findings underscore the importance of motivation-oriented interventions in the development of speaking fluency in distance learning.

Keywords: ARCS, L2MSS, Motivational Programs, Online Learning, Speaking Fluency

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Introduction

Motivation is widely regarded as a key determinant in second/foreign language (L2) learning. It is essential for student engagement, whose intensity can influence L2 fulfilment rate (Nguyen et al., 2020). Therefore, researchers (e.g., Guilloteaux & Dörnyei, 2008; Li & Huang, 2024; Zhou et al., 2024) have resorted to more practice-oriented approaches regarding motivation. Keller (1979, 1999, 2010) identified four components of the construct of motivation and put forward the ARCS (attention, relevance, confidence, and satisfaction) model, highlighting personal needs and positive expectancy for success. Moreover, drawing on *self* psychology, Dörnyei (2005) introduced the L2 motivational self system (L2MSS), which aims to help individuals get away from the existing self and approach the imagined self (Dörnyei, 2009) through visionary images of the future.

For many L2 learners, speaking fluency represents L2 proficiency (Tavakoli & Hunter, 2018) and they seek to achieve it (Naghavian, 2024). Generally, fluency is characterized by those dimensions of linguistic performance that are related to the smoothness of language use or fluidity (Segalowitz & Freed, 2004). Fluency, in its broad sense, corresponds with language proficiency, whereas, in a narrow sense, it deals with time-related features of speech (Yan et al., 2020). Since unfragmented speech marks proficient L2 users, speaking fluency should be prioritized in L2 programs.

Although speaking fluency has been explored in various contexts in the past decades, little research has targeted it in distance education, particularly with an eye on motivation-based instructional frameworks. Additionally, the use of technology has expedited online learning (Arifin et al., 2025), which can provide opportunities for the development of L2 oral skills (Timpe-Laughlin et al., 2024). This study scrutinized speaking fluency development in synchronous online learning through two motivation-based instructions/interventions, namely ARCS-based motivational and L2MSS vision-inspired instructions.

Literature Review

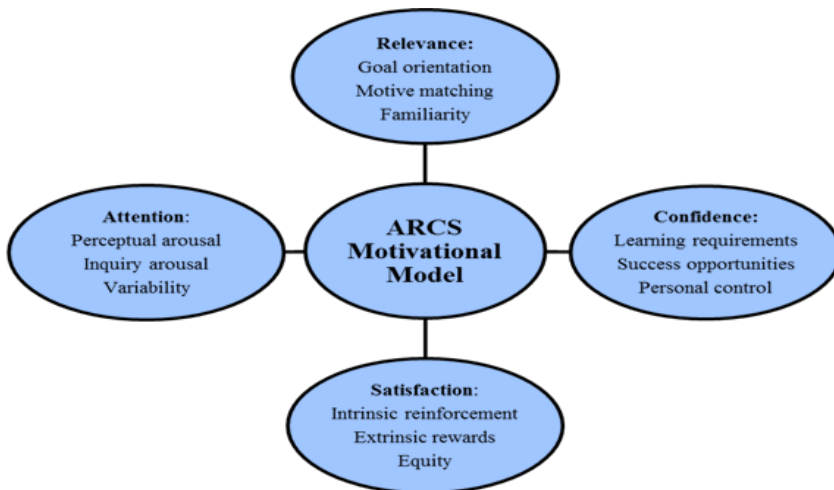
Initial motivation conceptualizations, which date back to the early 20th century, rest on instincts and drives (Johnson, 2022). In behavioristic psychology, motivation is defined as an attribute that arises if conditioning occurs (Schunk, 2012). Such a position leaves limited space for volitional decision-making. On the other hand, cognitive psychologists have maintained that motivation is proportional to cognitive engagement, and that high levels of motivation are directly associated with cognitive strategy use (Lee & Koszalka, 2016). Similarly, humanistic approaches do not probe motivation in a vacuum and distinguish between intrinsic motivation and external reinforcements (Deci & Ryan, 2011). Both cognitive and humanistic approaches agree with the process-oriented delineation of motivation, which assumes variations in motivation over time in changing contexts (Bower, 2017).

Developed as a synthesis of motivation-related concepts and features (Keller, 1987, 2010), the ARCS model considers the components of attention, relevance, confidence, and satisfaction to build a self-contained motivation model in educational contexts. It is rooted in expectancy-value theory. Expectancy for success can be viewed as an individual’s perception of his/her ability and how well he/she can do in a given task whereas task values can be regarded as the subjective significance or task motivational appeal, which influences the likelihood of participation in a task (Nagle, 2021).

The ARCS model features three important qualities. These qualities include characterizing the key components of human motivation, devising practical strategies to motivate learners, and having a systematic design process which can be executed with typical instructional design models. This model is identified with four distinctive components/elements (see Figure 1).

Figure 1

Components and Subcomponents of the ARCS Model



The attention element of the ARCS model, as displayed in Figure 1, is related to attracting learners to the stimuli and sustaining it. The relevance element deals with the consistency between the learning requirements and future needs. The likelihood of success in learning and its experience in learning settings lead learners to a level of confidence, as the third element. The satisfaction element postulates that learning is reinforced if internal and external rewards are defined and offered in a timely fashion.

Researchers (e.g., Kurt & Keçik, 2017; Ucar & Kumtepe, 2019; Wu, 2018), using the ARCS framework to investigate language-related variables, have demonstrated its effectiveness, especially in technology-enhanced settings (Ma & Lee, 2021). Wu (2018) exhibited the efficiency of using the ARCS model for constructing a game-based English vocabulary practice system and fostering lexical

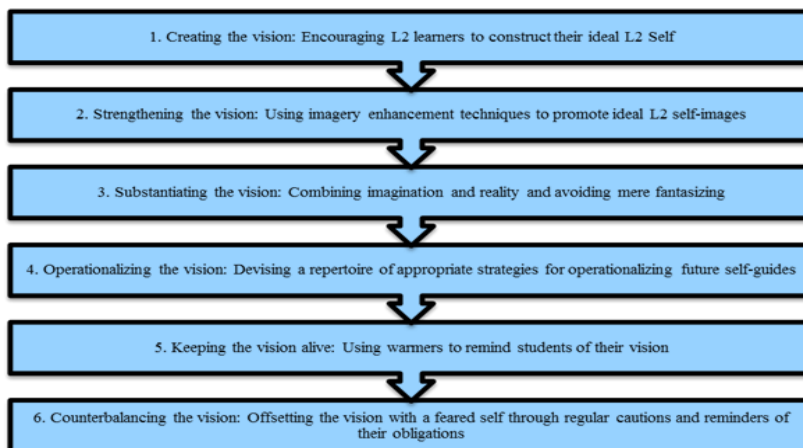
retention of English vocabulary at a Taiwanese university. Also, Ucar and Kumtepe (2019) applied the model in an English course for undergraduate online learners, yielding significantly higher gains in the course interest and academic performance. Furthermore, the ARCS model has been used to improve learner engagement and motivation in virtual settings in other fields (e.g., Huett et al., 2008; Jeong et al., 2023).

The growing dissatisfaction with the early Gardnerian perspective of motivation led researchers (e.g., Dörnyei, 2005) to look for more comprehensive alternatives. Dörnyei (2005), resorting to Markus and Nurius's (1986) Possible Selves theory, Higgins's (1987) theory of self-discrepancy, and his own large-scale study in Hungary, proposed the L2MSS model, which has been used or validated in research studies. It is based on three main components. As Dörnyei (2005) describes, the ideal L2 self refers to the L2-specific dimension of an individual's ideal self. It depicts an ideal picture of the L2 user's future regarding their wishes and aspirations. It concerns how a person views the L2 qualities they wish to develop (Henry & Liu, 2024). Ought-to L2 self deals with the requisite L2-related qualities one must obtain. It is a projected self which is governed by the expectations of significant others, such as parents and teachers (Xu & Wang, 2022). L2 learning experience refers to the environmental conditions of L2 learning, including teachers, peers, and the curriculum.

Additionally, imagery has been identified as an important aspect of the L2MSS model, enabling L2 learners to envision a desirable vision. According to Dörnyei (2005), this mental self-image can motivate L2 learners to take action in accomplishing their visionary future selves. Thus, he proposed a vision enhancement program, relying on L2MSS, to reinforce the possible selves. A brief outline of the key steps in the vision enhancement program (Dörnyei & Ryan, 2015) is displayed in Figure 2.

Figure 2

Key Steps in the Vision Enhancement Program



Empirical studies utilizing the L2MSS model fall into two major groups. The first group concentrates on correlational studies (e.g., Kim & Kim, 2011; Lamb, 2012), aiming to determine the predictive power of the model. The second group comprises experimental studies (e.g., Chan, 2014; Ye & Hu, 2025), aiming to exploit the L2MSS's practical potential for developing learners' motivational and L2 learning performance. Sato and Lara (2019) employed vision intervention strategies such as imagery techniques and visual stimuli, which led to the substantiation of the L2 learners' ideal L2 self. In another study, Ghasemi (2022) launched a vision-based motivational program. The results indicated meaningful improvements in terms of mitigated helplessness symptoms and academic achievement. However, there exists limited empirical research that has invested in the effectiveness of the L2MSS vision enhancement framework in the L2 context in relation to oral L2 skills.

Speaking fluency is among the foremost measures of L2 competence (Tavakoli et al., 2020). It "refers to the learner's smoothness and speed oral productions (Handley & Wang 2024). However, there are various definitions and assessment strategies for L2 speaking fluency. Segalowitz (2010) proposed a triadic framework, which comprises three aspects: cognitive, utterance, and perceived fluency. Cognitive fluency deals with the L2 speaker's mental capacity or linguistic knowledge to deliver L2 speech, which is the coordination of various interacting cognitive processes. Utterance fluency deals with the actual act of performance by the L2 speaker. Perceived fluency pertains to the L2 listener's assessment of the interlocutor's cognitive fluency. Most often, speaking fluency is viewed from the utterance perspective (Handley & Wang 2024; Kormos & Dénes, 2004), which involves the examination of temporal aspects of fluency such as articulation rate, mean length of run, speech rate, and number of silent pauses. These aspects can be measured objectively while perceived fluency focuses on listeners' subjective evaluation of a speaker's cognitive fluency. According to Segalowitz (2010), perceived fluency is based on a holistic impression perceived by the listeners about the fluidity of the speaker's speech samples. Also, based on the cognitive perspective, fluent L2 speech features execution of some mechanisms and involves cognitive processes which are difficult to measure objectively and simultaneously.

On the empirical side, speaking fluency has been probed with regard to various factors including anxiety (e.g., Kormos & Préfontaine, 2017), willingness to communicate or WTC (Ebn-Abbasi et al., 2022), and self-image (Alimorad & Yazdani, 2020). Blake (2009) attempted to improve the utterance fluency by utilizing a text-based online chat and conventional face-to-face instruction. The results revealed significantly greater gains in phonation time ratio and mean length of run in favor of the synchronous mode. Also, Razagifard (2013) employed asynchronous and synchronous text-based computer-mediated communication (CMC) to develop the utterance fluency of intermediate learners of English completing communicative tasks. The findings showed that the learners in the synchronous mode surpassed those of the control group in the fluency measures. Likewise, Hamouda (2020), who investigated the impacts of virtual classes on Saudi L2 learners' oral skills, reported significant gains in utterance fluency, compared to traditional offline classes.

Prior research (e.g., Nguyen et al., 2020; Timpe-Laughlin et al., 2024) has highlighted the importance of motivation in L2 learning as well as the positive effects of instruction in online L2 learning contexts. In line with this issue, a handful of research (e.g., Ucar & Kumtepe, 2019; Ye & Hu, 2025) have investigated the ARCS and L2MSS instructional frameworks in relation to some learner or language-related variables. However, empirical studies examining the impact of motivation-based programs like ARCS and L2MSS-oriented instruction on L2 speaking fluency are scanty. Little empirical research has also paid attention to the temporal aspects of L2 speaking fluency, which can be measured objectively. This gap is also evident in online L2 learning studies, which suggests doing research in this domain. Moreover, as some researchers (e.g., Jiang, 2023) have emphasized, some challenges like learners' lack of motivation in L2 learning within the EFL context during the COVID-19 era continue to persist even after the pandemic. Accordingly, research on motivation-based programs to enhance L2 oral skills such as speaking fluency can be promising.

Research Questions

The present study looked into the effects of ARCS-based and L2MSS vision enhancement instructions in two groups of L2 (English) learners in improving their speaking fluency in an online environment and compared their effects on L2 speaking fluency in the two groups which implemented the ARCS and L2MSS vision-inspired frameworks with the group which did not receive these specific motivational interventions. Accordingly, the following research questions were addressed:

1. Is there a significant difference in the L2 learners' speaking fluency outcomes between the ARCS-based online classroom group and the online control group after implementing the instruction?
2. Is there a significant difference in the L2 learners' speaking fluency outcomes between the L2MSS vision-inspired online classroom group and the online control group after implementing the instruction?
3. Is there a significant difference in the L2 learners' speaking fluency outcomes between the ARCS-based online classroom group and the L2MSS vision-inspired online classroom group after implementing the instruction?

Method

Participants

The participants were 61 upper-intermediate EFL learners with an age range of 16-20 and 5 years of English learning experience. They registered for an advanced course intended for adults at a state-owned language institute to improve their English. The course syllabus required learners to speak about a variety of topics through discussion activities and vocabulary-development tasks aiming to enhance language skills. The participants were chosen from intact classes in the language institute based on a convenience sampling method. After ensuring there were no significant differences among the three classes through administering the Outcomes Placement Test (2016), each class was randomly assigned to one of the conditions to reduce possible class-level variability. Accordingly, this study

included three groups: an ARCS-based group, an L2MSS vision-inspired group, and a control group. Table 1 presents the demographic characteristics of the groups.

Table 1

The Groups' Demographic Characteristics

Group	Gender	N	Mean Age
ARCS	Male	11	19.1
	Female	10	18.7
L2MSS	Male	10	19.3
	Female	10	18.8
Control	Male	11	18.5
	Female	9	18.6

Materials and Instruments

Prior to the main study, the Outcomes Placement Test (2016) was used to check the initial level of the participants' English proficiency. The test was composed of two sections: lexicogrammar and speaking. Also, one-way (non-interactive) structured oral interviews were used as the speaking pretest and posttest to measure the temporal aspects of the participants' speaking fluency: articulation rate, speech rate, mean length of run, and the number of silent pauses. The structured oral interviews consisted of 4 questions (both in the pretest and posttest stage) selected from the TOEFL iBT speaking test section (the Independent Speaking Task section), both at the pretest and posttest stage. The questions/prompts were in line with the participants' textbook content.

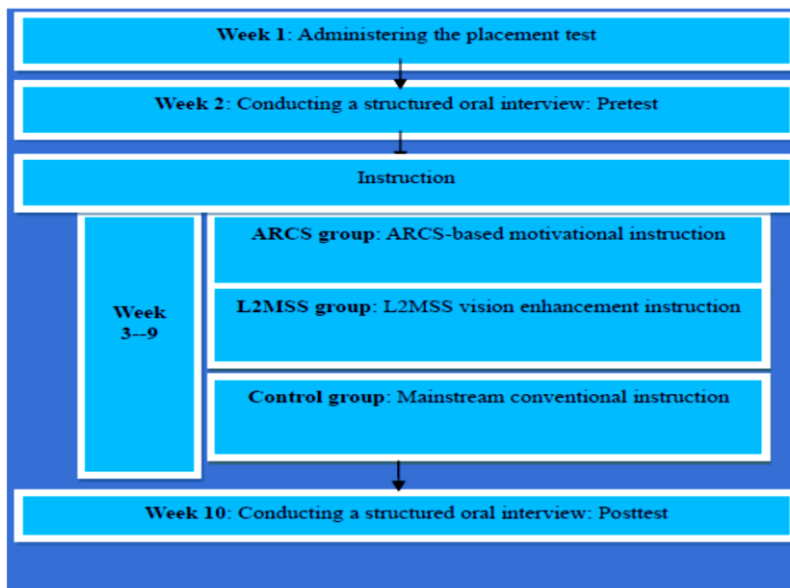
The interview was conducted in several steps/phases (opening, conducting, and closing) in English based on a protocol. In the conducting phase of the structured interview, the interviewer (one of the current researchers) read the questions (e.g., Should students be assigned daily homework at school? Why or why not? Explain) twice to the interviewees separately, and then they were asked to talk about each question for a maximum of 90 seconds. They had 1 minute time for preparation. Their responses were then recorded using Adobe Connect software. The content validity of the interview questions was checked through expert judgment by two associate professors of applied linguistics as well as an English teacher, who offered feedback on the appropriateness, relevance, and clarity of the questions to the level and course.

Procedure

The whole study underwent four phases: (1) administering the Outcomes Placement Test, (2) conducting a pretest interview, (3) giving instructions, and (4) having a posttest interview (see Figure 3).

Figure 3

Schematic Presentation of the Procedures



Phase 1: After obtaining consent, as displayed in Figure 3, the participants took the placement test to assess their English language level. To establish homogeneity, tests of significance were conducted on the scores obtained from the lexicogrammar and speaking sections of the placement test. The Kruskal-Wallis tests revealed no significant differences in the scores for both lexicogrammar, $H(2) = 1.479$, $p = .477$, and speaking parts, $H(2) = 1.537$, $p = .464$, respectively. In consequence, the next phase commenced a week later.

Phase 2: In the pretest phase, prior to instruction, the participants were interviewed in English through a structured (one-way) oral interview, taking four questions adopted from the TOEFL iBT speaking section. The interviews were conducted online in the language lab using the Adobe Connect platform’s recording tool, with each interview lasting about 10-15 minutes. First, the interviewees were asked to briefly introduce themselves, which was not recorded. In the main part of the speaking interview, each speaking item was read twice for the interviewees. They were given 1 minute to think and take notes. When ready, they began speaking while being recorded.

Phase 3: After the pretest, instruction was provided to each group, lasting over 14 sessions, two 90-minute sessions per week. Two of the online classrooms received instructions based on the premises of the ARCS motivational and the L2MSS vision enhancement interventions.

In the ARCS group, motivational strategies and techniques were derived from the four elemental components (attention, relevance, confidence, satisfaction),

adapted to the online environment. Audio-visual aids such as video files and concept maps were used to draw the learners' attention. To maintain interest and attract attention, humor in the form of jokes and enigmas was employed. Brainstorming activities were frequently employed to connect course content to the participants' prior knowledge. At times, the instructor made statements that contradicted the learners' past experiences to capture their attention. To establish relevance, the teacher clarified the course objectives and its usefulness, created a non-competitive context by encouraging collaborative conversations, and asked for the learners' personal accounts related to the topics of the class session.

To boost the learners' confidence, the instructor vividly presented the course outline and requirements at the beginning. He asked them to do self-assessments and peer-assessments by providing them with some charts at the end of each session. To reduce anxiety, the instructor formed pairs in the Break Out (Virtual) Room to do pair groups. To ensure satisfaction, the instructor provided positive feedback including verbal praise and approval stickers in the comments section of the software. Additionally, some bonus marks were awarded for their success in completing assignments. Moreover, role plays and problem-solving activities such as puzzles were frequently utilized. Also, to reinforce positive feelings, cooperative group work was also incorporated.

In the L2MSS group, the focus was on creating and strengthening the learners' vision. Throughout the course, the same instructor invited the learners to talk about their expectations, wishes, and concerns. To strengthen the vision through the imagery workout technique, the learners were asked to imagine and elaborate on an imaginary L2-related situation in the future. Moreover, in online groups of 3 or 4, they were tasked to prepare a motivational speech and express their group's collective vision. Image streaming activity, which is selecting a prompt from the textbook and asking the learners to orally complete the narrative via imagination in a detailed account, was used. Also, the instructor asked the learners to reflect on their L2-related future image and write down their goals, dreams, and intentions on a vision board.

To substantiate the vision, they discussed their strengths and weaknesses through pair groups. While working in groups, they were asked to share their learning experiences and offer L2 learning tips to develop a roadmap. To keep their visions alive, he assigned conversations in pairs focused on their dreams and aspirations. On occasion, the learners described their failures and potential modifications in the future. One frequent assignment was orally narrating how success or failure in their English learning would be important for others. The instructor invited them to discuss the future consequences of failing to improve their English proficiency.

In contrast, the control group did not focus on promoting motivation. This group received the conventional teacher-centered method commonly used in most language institutes in the country. The class was characterized by less motivational feedback and less peer discussion during task completion. For instance, when the learners were asked to explain some famous quotes in the textbook, they did it

individually, lacking much peer evaluation or peer feedback. As another example, when they were presented with different lifestyles from different cultures, they simply described them without referring to their lifestyles or sharing their views with peers.

Phase 4: One week after instruction, all participants from the groups were interviewed again. Similar to the pretest phase, structured interviews were conducted online to collect data on the speaking fluency measures using 4 parallel questions (e.g., Should parents be allowed to educate their children at home? Why or why not? Explain). A minimum of 60 seconds was set as the baseline for the audio files to be imported into the PRAAT software, a speech analysis program. Each participant’s final audio file thus measured 240 seconds for both the pretest and posttest. The four temporal aspects of speaking fluency, as described by Suzuki and Kormos (2022), were measured utilizing an analysis script. These four variables with their definitions are provided in Table 2.

Table 2

Temporal Variables of Speaking Fluency Construct

Measure	Definition
Articulation rate	Number of syllables per phonation time
Speech rate	Number of syllables per second
Silent pause rate	Number of silent pauses per second
Mean length of run	Mean number of syllables between two silent pauses

Then, each participant’s raw data on articulation, speech, and silent pause rates as well as mean length of run, which are associated with utterance fluency aspect of Segalowitz’s (2010) framework, in the pretest and posttest were analyzed using SPSS (version 26). These four temporal variables were chosen because of their operationalizability via objective measurement in the PRAAT software and availability of a pre-existing analysis script to ensure replicability. Also, many scholars (e.g., Suzuki & Kormos, 2025) have recently emphasised the importance of objective fluency measures as reflections of the underlying L2 proficiency. Additionally, they are widely recognized in the literature.

Results

Descriptive Statistics and Pretest and Posttest Speaking Fluency Differences

Initially, descriptive statistics for the data on four fluency measures were obtained for both the pretest and posttest phases. These statistics are summarized for the three groups in Table 3.

Table 3

Descriptive Statistics of Speaking Fluency Measures in the Pretest and Posttest Phases for the Three Groups

Variables	Group	M		SD		Skewness		Kurtosis	
		Pre	Post	Pre	Post	Pre	Post	Pre	Post
Speech Rate	ARCS (n = 21)	3.02	3.23	.637	.634	-.61	-.67	-.63	-.53
	L2MSS (n = 20)	3.18	3.44	.487	.454	-1.57	-.42	3.79	4.45
	Control (n = 20)	3.07	3.11	.522	.410	-.51	-1.21	-.25	3.89
Articulation Rate	ARCS (n = 21)	3.75	3.82	.538	.700	-1.44	-1.39	1.72	2.00
	L2MSS (n = 20)	3.86	3.93	.439	.475	-.66	-1.26	3.54	4.52
	Control (n = 20)	3.77	3.66	.261	.357	-1.79	1.29	4.40	1.22
Mean Length of Run	ARCS (n = 21)	10.13	12.32	2.209	2.750	-.99	-.56	.25	-.67
	L2MSS (n = 20)	10.93	11.87	1.537	1.457	-.93	-1.10	-.43	.23
	Control (n = 20)	10.51	10.53	1.082	1.172	-2.05	-.12	9.42	3.42
Silent Pause Rate	ARCS (n = 21)	.30	.26	.117	.089	-.10	.32	-1.73	-.34
	L2MSS (n = 20)	.28	.24	.053	.068	-1.74	-.25	3.32	2.12
	Control (n = 20)	.32	.32	.048	.060	-.75	-.51	3.81	1.79

The highest mean scores on speech rate and mean length of run in the posttest were observed in the L2MSS ($M = 3.448$) and ARCS ($M = 12.320$) groups, respectively. For articulation rate, the highest mean score in the posttest was observed in the L2MSS group ($M = 3.934$). As for the silent pause rate, a decrease from the pretest ($M = .301$ and $M = .284$) to the posttest ($M = .264$ and $M = .244$) was observed in the ARCS and the L2MSS groups, respectively, indicating improved speaking fluency performance in the experimental groups.

Since values of kurtosis and skewness on the pretest and posttest fluency measures were not small, Kolmogorov-Smirnov tests were run on the four fluency measures to assess data normality. Based on the results, the distribution of data for all four variables across the three groups was not normal ($p < 0.05$). Therefore, to probe any meaningful differences among the groups regarding each speaking fluency measure, the nonparametric analysis, Kruskal-Wallis tests, was run for further statistical analyses.

The results of the nonparametric Kruskal-Wallis tests showed that there was no statistically significant difference among the groups' performance in the

pretest phase on speech rate, $H(2) = .439, p = 0.803$; articulation rate, $H(2) = .830, p = .660$; mean length of run, $H(2) = 2.325, p = .313$; and silent pause rate, $H(2) = 4.932, p = .085$, indicating that all groups were homogeneous prior to instruction. In contrast, there was a statistically significant difference between the performance of the three groups in the posttest phase on speech rate, $H(2) = 6.478, p = 0.039$; articulation rate, $H(2) = 8.942, p = .011$; mean length of run, $H(2) = 9.179, p = .010$; and silent pause rate, $H(2) = 13.387, p = .001$, indicating that, after instruction, the mean scores underwent significant changes across all speaking fluency measures.

Results of Within- and Between-Group Comparison Tests

To look into the developmental effects, namely improvement from the pretest phase to the posttest phase for each of the four fluency aspects, the nonparametric Wilcoxon test was run in each group. The results are summarized in Table 4.

Table 4

Results of Within-Group Wilcoxon Tests on Speaking Fluency Measures from Pretest to Posttest

Variables	ARCS		L2MSS		Control	
	Z	Sig.	Z	Sig.	Z	Sig.
Speech Rate	2.464	.014*	3.923	.000*	.037	.970
Articulation Rate	.939	.348	2.201	.028*	1.241	.215
Mean Length of Run	2.903	.004*	2.912	.004*	.709	.478
Silent Pause Rate	2.103	.035*	3.249	.001*	.075	.940

The results, as displayed in Table 4, illustrate that the speaking fluency aspects improved from the pretest to the posttest in the experimental groups. In the ARCS group, speech rate ($p = .014$); mean length of run ($p = .004$), and silent pause rate ($p = .035$) improved significantly. The development was noticeable in the L2MSS group, which demonstrated improvement in all four fluency aspects. In contrast, none of the speaking fluency aspects in the control group changed significantly over time. Lastly, to compare the effectiveness of instruction in the fluency improvement between the groups and address the research questions, Mann-Whitney post hoc tests were run (Table 5).

Table 5

Results of Post Hoc (Between-Group) Test on Speaking Fluency Measures

Variable	ARCS/Control		L2MSS/Control		ARCS/L2MSS	
	Chi-Square	Sig.	Chi-Square	Sig.	Chi-Square	Sig.
Speech Rate	8.74	.344	14.15	.035*	-5.40	.989
Articulation Rate	13.31	.049*	15.45	.018*	-2.13	.999
Mean Length of Run	16.14	.010*	12.20	.089	3.99	.999
Silent Pause Rate	-15.89	.012*	-19.15	.002*	3.25	.999

The first research question was intended to examine the potential significant differences in the L2 learners' speaking fluency outcomes between the ARCS and control groups following instruction. Based on the analytic results in Table 5, there were noticeable differences between the two groups, favoring the ARCS group regarding articulation rate ($p = .049$), mean length of run ($p = .010$), and silent pause rate ($p = .012$).

The second research question was intended to examine the potential significant differences in the L2 learners' speaking fluency outcomes between the L2MSS and control groups following instruction. Based on the analytic results in Table 5, there were noticeable differences between the two groups, favoring the L2MSS group regarding speech rate ($p = .035$), articulation rate ($p = .018$), and silent pause rate ($p = .002$).

The third research question was intended to examine the potential significant differences in the L2 learners' speaking fluency outcomes between the ARCS and L2MSS groups following instruction. Based on the analytic results in Table 5, there were no statistically noticeable differences between the two groups regarding speech rate ($p = .989$), articulation rate ($p = .999$), mean length of run ($p = .999$), and silent pause rate ($p = .999$).

Discussion

This research provides insights into the potential effectiveness of motivation-oriented instruction in EFL learners' speaking fluency development in online contexts. The first research question targeted the difference in speaking fluency development between the ARCS-based and control groups. The results showed that articulation rate, silent pause rate, and mean length of run aspects developed greater in the ARCS-based group, and the results reached statistical

significance. It is deduced that the strategies employed in the ARCS group assisted the learners more greatly in producing more syllables per phonation time, more syllables between two silent pauses in their talk, and fewer pauses. Attention-focused and relevancy-oriented activities such as giving a personal account and fun activities in the online environment like telling jokes probably motivated the learners in the ARCS group to engage deeply in satisfactory collaborative conversations with their peers and instructor, and helped them to attach the new incoming verbal input to their background knowledge with ease. As De Jong et al. (2013) concluded, cognitive fluency is associated with L2 utterance fluency. In the current study, cognitively engaging activities such as brainstorming improved the learners' task engagement, which in turn contributed to improvement in utterance fluency. These activities might have helped them retrieve language-related components with more ease, be less distracted, and produce more syllables in their speech. Based on the expectancy-value theory, goal expectancy and motivation correlate in a positive direction, and the activities used in the ARCS group possibly helped them internalize a sense of goal approximation, increasing their effort invested in improving speaking fluency.

Moreover, as Chang and Lehman (2002) argue, the use of multimedia can facilitate language processing. The increased integration of visual aids in the ARCS group (e.g., concept maps or PowerPoint slides), which allowed the dual-mode representation of information (in both textual and visual modes), possibly facilitated L2 speaking processing and verbal information retrieval, contributing to the learners' speech fluency. The above point aligns with the finding of Timpe-Laughlin et al. (2024) who demonstrated that motivationally relevant and supportive learning environments contributed to learners' speaking fluency and learning outcomes. Moreover, most likely, the deliberate attempt to establish relevance by clarifying the objective and providing statements about the efficacy of motivational instruction made the instruction very responsive to their motives, contributing to higher articulation in the L2 learning process. It is reported that relevance-enhancement strategies corresponding with the ARCS model can improve L2 learning in foreign language learners with differing motivational levels (Chang & Lehman, 2002).

Presumably, confidence-building activities in the ARCS group fostered a stronger sense of fulfilment and made the L2 learners talk and generate more input. Consequently, speaking fluency aspects were gradually enhanced in the ARCS group. Fluency is achieved when accessing and producing syntactic and semantic linguistic resources reach the level of automaticity (Segalowitz, 2010). In this way, confidence-boosting activities might have reduced learner stress, enabling them to retrieve relevant information and speak more effortlessly, resulting in longer stretches of L2 production and less pause rate. Conceivably, the higher level of confidence neutralized the sense of helplessness and made the learners in the ARCS group attribute their success to their abilities, and this mindset might have increased the output in the form of articulation rate. This increased autonomy due to higher self-confidence could impact their speaking fluency (Mehrin, 2017). Additionally, the use of verbal praise and emphasis on content-evaluation consistency in this group created positive feelings and less speaking fear in online settings, leading to

more output production and fewer disconnected utterances. Generally, the satisfaction-oriented activities can balance the preconceived ideas about the course outcomes and provide a logical expectation of success (Keller, 2016).

Although the ARCS group showed noticeable improvement in articulation rate, silent pause rate and mean length of run through implementation of various activities (e.g., attention-focused, relevancy-oriented, confidence-building, and satisfaction-oriented activities), no significant differences were observed in speech rate. This issue suggests that the ARCS motivational interventions can enhance some dimensions of speaking fluency, but other aspects of utterance fluency such as speech rate may depend on more extended L2 (English) exposure, targeted fluency training, and practice.

The second research question concentrated on the development of speaking fluency measures between the L2MSS and the control group. Meaningful differences were spotted between them regarding articulation rate, speech rate, and silent pause rate. This result shows the participants in the L2MSS group produced more syllables and reduced the number of their silent pauses in the talk. It can be argued that the imagery techniques such as image streaming depicted a promising future guide that could stimulate the learners to invest more time and energy to materialize it. Most likely, they learned to concentrate on their self-images in group work and consequently participated in collaborative conversations more than the learners in the teacher-centered control group, which improved their L2 speaking fluency more effectively. As Safdari (2021) points out, the advantage of imagery techniques is that they inject the joy of momentarily experiencing the endpoint. Through vision substantiation, they became cognizant of their weaknesses and strengths in speaking, and they possibly learned to redress their weaknesses in speaking, such as redundant pauses. Also, such activities as collective vision activity, sharing the learning experiences, and outlining a roadmap for future success in English possibly created a positive and encouraging environment for more communication and interaction in the online environment, resulting in a higher articulation rate. This justification is supported by the study of Ebn-Abbasi et al. (2022), whose findings showed that higher levels of ideal L2 self would lead to less communication apprehension, more WTC, and better oral performance. The positive effect of L2MSS vision-inspired strategies on speaking fluency in the present study has also been corroborated by the findings of Alimorad and Yazdani's (2020) study. They examined the impact of self-image improvement on EFL learners' oral performances (complexity, accuracy, & fluency) in the offline mode of learning. They reported that self-image enhancement techniques improved speech rate and mean length of run.

The results demonstrated lack of significant differences between the L2MSS and control groups in terms of mean length of run. Motivation-based interventions alone may not be sufficient to drive changes in all aspects of utterance fluency. Mean length of run indicates chunking ability and syntactic planning, whereas articulation rate and speech rate indicate speed-related fluency, and silent pause rate indicates the frequency of hesitation. The L2MSS vision-inspired instruction may have contributed to the reduced hesitation and speed-related aspects

of fluency by increasing the learners' motivation to participate in the activities and promoting a supportive speaking environment, but might not have had great influences on the ways the learners organized speech into longer syntactic units in learning.

The last research question dealt with the differential effect of the ARCS-based and L2MSS vision-inspired instructions on speaking fluency development in the two motivation-based groups. The results did not indicate any great differences; that is to say, neither group outperformed the other regarding fluency development. This issue indicates that both methods of instruction can be effective for L2 fluency development in an online setting. In line with the above-mentioned argument, attention-, relevance-, confidence-, and satisfaction-oriented motivational activities as well as L2 self-image enhancement activities most likely fostered the learners' cognitive involvement during class instruction, aroused interest, reduced stress, and enhanced WTC, all leading to higher articulation and speech rates, as well as mean length of run and lower silent pause rate in the online environment. The results of the prior studies such as Razagifard (2013) partially support the above results in that L2 speaking fluency can be developed via instruction in online environment development.

Conclusion

This study attempted to examine the effectiveness of ARCS-based and L2MSS vision-inspired instruction on enhancing the speaking fluency of EFL learners in online courses. The results revealed that both motivation-based instructional methods were more effective in developing speaking fluency, in general, as compared to the conventional approach. Applying the techniques aligned with the ARCS motivational model resulted in more improvement in such fluency aspects as articulation rate, silent pause rate, and mean length of run. Also, applying the techniques aligned with the L2MSS vision-inspired framework led to the greater development of silent pause rate, articulation rate, and, to some extent, speech rate, accentuating the role of motivation-oriented instruction in speaking fluency development.

The findings of the current research imply that motivation-based activities can provide collaborative conversation opportunities in online classes, and contribute to more fluent speech production. Based on the results, L2 teachers can develop learners' speaking fluency by helping them develop a clear L2-related image in their L2 conversation classes, for example, through such activities as image streaming. They can also help them by creating a roadmap through an analysis of their own desirable future, obligations, strengths and weaknesses. The findings highlight the importance of vision-based motivational activities in online L2 classes. L2 teachers can help their learners engage with vision-based motivational activities and form a sense of personal purpose to develop their speaking fluency. According to the findings, the ARCS and L2MSS motivation-based activities in their online classes can keep L2 learners' motivation level high in online classes, contributing to their utterance fluency development. It is recommended that L2 material developers incorporate the four components of motivation (attention, relevance, confidence, &

satisfaction) into the design of speaking activities or tasks and integrate visual aids to support L2 learners' future self-image construction and ensure that speaking activities are collaborative and rewarding.

Several limitations should be acknowledged. Although 14 sessions seem to be a suitable timeline for an empirical study, a longer period would be better to investigate the long-lasting effects of motivation-based instruction. Additionally, the sample size was small and a delayed posttest interview was not included in the design, which limits insight into long-lasting effects. Future researchers can include a delayed posttest interview to examine the effects of the ARCS-based and L2MSS vision-inspired instruction over time. Also, a qualitative follow-up phase was not included in the design. A qualitative follow-up investigation is recommended to see why some speaking fluency features develop more than others.

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