

## The research of implementing the computer-supported collaborative learning environment with Google Slides

Dinh Bich Thao<sup>1\*</sup>, Pham Thi Nghia Van<sup>2</sup>

<sup>1</sup> Hanoi University of Industry, Ha Noi, Vietnam

<sup>2</sup> Hanoi Pedagogical University 2, Ha Noi, Viet Nam

\* Corresponding author's email: [dinhbichthao@hau.edu.vn](mailto:dinhbichthao@hau.edu.vn)

 <https://orcid.org/0000-0002-6017-2707>

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### ABSTRACT

The purpose of his study is to use Google Slides in the collaborative editing software to explore whether it is helpful to implement collaborative learning in teaching college students. This study applied a quantitative research method; 200 undergraduate students who are Chinese majors at Hanoi Pedagogical University 2 will randomly select as participants. After developing the CSCL environment, in which classroom experiments were conducted, the scale was developed to investigate and use SPSS to analyze various possible influences on learning motivation. In addition to collecting and analyzing quantitative data, research, and discussion were carried out by observing the reactions and performance of students in class. Through literature research, investigate various independent variables that may affect learning motivation. This research analyzed with non-numerical statistical methods to explore learning achievement, learning anxiety, and learning attitude, and discuss whether independent variables such as self-efficacy will have an impact on learning motivation to evaluate the feasibility of Google Presentation as computer-assisted collaborative learning. The findings from the quantitative analysis show that students are highly motivated to use Google Slides to implement computer-assisted collaborative learning and are not affected by learning achievement, learning anxiety, learning attitude, and self-efficacy in discussions.

**Keywords:** Google Slides, CSCL, Collaborative Learning

### Introduction

The learning community concept is a concept of education that Dr. Manabu Sato proposed in 2012. These educational concepts have influenced the world and set off a learning revolution in which the importance of "collaborative learning" is emphasized. The researcher believes that future teachers need to adapt to the current educational trend and use computer-assisted collaborative learning to establish a teaching environment for students to develop their learning

literacy.

Until today, a wide variety of collaborative application platforms are provided for free, and they are very easy to obtain. If information technology is easy to use and valuable, it will increase the willingness of teachers and students to continue using it. Teachers are the key to deciding whether the teaching site is willing to choose these collaborative application platforms to integrate information into teaching (Liu, Y., Fan, T., Chen, T., Xu, Q., & Yang, Q., 2021),

This research refers to the past literature and found that although the related research of computer-assisted collaborative learning (CSCL) has been developed for many years, based on the observation of researchers in the teaching field for many years, the current teachers are generally due to insufficient information ability, old hardware equipment, and classrooms. (Fan, Q., Fan, D. P., Fu, H., Tang, C. K., Shao, L., & Tai, Y. W., 2021). The performance of the internal wireless network AP is too old to support the need for multiple people to surf the Internet simultaneously and coupled with the time pressure of teaching progress and other factors, and there are still many universities in Asia countries, including Vietnam, that have to implement computer-assisted collaborative learning classrooms at the university teaching site. (Ansari, J. A. N., & Khan, N. A., 2020).

Although the integration of information technology into learning was advocated and encouraged in the past, the general university teachers' learning-centered integration of information technology into teaching is still insufficient. They lack the motivation to learn related knowledge and actively promote curriculum innovation. Education should guide students to become independent in the application of information technology.

Adaptability and active learning cultivate the resources, opportunities, and ability to construct knowledge for a long time. Researchers chose Google Presentation as a research tool because, based upon the previous research, have been found that PPT presentation is a kind of application software that teachers are more familiar with because we often use it as a tool for teaching or reporting, so there is less rejection and fear in the attitude of use. Students will also have many opportunities to use briefings in the future, from universities to graduate schools, and even to work outside of society (Stahl, G., Koschmann, T., & Suthers, D.D., 2006). In addition to displaying personal works, Google Presentations also have a built-in design for interactive discussions and collaborative learning with others. Therefore, Google presentations are used as a tool for computer-assisted collaborative learning.

## Literature review

### *Apply Google Slides as a research platform.*

Google Slides is one of the Google Docs Editor suite apps provided by Google LLC. Google Presentation is easy to learn and use. The interface is similar to the familiar PowerPoint. The most significant feature is that it has online sharing editing, real-time annotation, and questioning functions, and it can be used on various platforms. However, it is recommended to use the Chrome browser or download the free Google Newsletter APP to use it. There are no hardware platform restrictions when using it. Students can choose to directly interact, discuss

and collaborate with any online classmates online without being restricted by space and time. Researchers have used Google presentations on commonly used computer operating systems, such as Windows 10, Mac, Chrome OS, and mobile operating systems, such as Android, iOS, Etc., and they can be used typically without any problems. It is a cross-platform application software used has the advantage that it can continue to use any new hardware purchased by the school in the future without restriction (Gao Shuzhen, 2012).

Wu Jian-Yi (2013) uses Google Cloud services to design a cooperative network learning study-taking elementary school social field learning as an example. The research participants and curriculum strategies adopted cooperative learning, but the method did not clearly describe using cloud tools in teaching. Therefore, the research participants and goals of this study differ from this study. To sum up, it encourages researchers to explore the possibility of Google Bulletin's teaching application and provides a reference for future researchers or on-site teachers. Provide teachers or students with one more choice and reference through the application of universal and unrestricted use, and also has an interactive communication function, Google briefing on implementing a kind of research literature of elementary school teaching site implementation information into teaching. The innovation of this research lies in the application of quick access to use, quick collection of student works, real-time display, real-time interactive discussion, and collaboration. According to previous studies, it is simple and easy to use and can meet the needs of specific teaching purposes at the teaching site. This research uses Google presentations as a tool for computer-assisted collaborative learning to explore the problems and solutions encountered in the process of implementation and uses self-compiled scales to analyze independent variables that may affect learning motivation; finally, supplemented by teaching Observation records are used to evaluate the feasibility of the results of this study.

#### *Computer Support Collaborative Learning and Learning Motivation*

Computer Support Collaborative Learning is a method of combining information technology with collaborative learning. Learning is carried out on the Internet or in an electronic classroom. CSCL can support students to study together, conduct discussions or exchange information through the Internet, and access content together (Tran, L. A., Tran, T. D., Nguyen, M. H., & Nguyen, M. N., 2023). Teachers and peers can also give feedback online at the same time. The earliest computer-supported collaborative learning (CSCL) concept appeared in a seminar in San Diego, USA, in 1989, so it has been developed for 30 years. However, it is also found in the literature: "Although future education can be assisted by cross-platform collaborative learning, CSCL has not yet had a significant impact on school education around the world. Stahl, G., Koschmann, T., & Suthers, D.D (2006) found that teachers and education authorities usually do not understand the social basis of learning and how Effective collaborative learning is carried out through classroom teaching, book learning, the Internet, and individuals to form a mutually supportive and flexible learning environment; therefore, it takes many years for teachers to create collaborative classrooms, and the development of effective groups can be carried out. Interactive courses require many iterative trials and redesigns.

In teaching activities, CSCL activities are challenging to evaluate its efficiency and effectiveness; early efforts focused on the potentially harmful effects of computer-mediated

communication but ignored the potential benefits of computer-mediated communication. Many researchers, such as Santoni, M. J., Kashyap, R., Camoin, L., & Borg, J. P. (2020), used the Group Scribbles (GS) version 2.0 software jointly developed with SRI International and Singapore NIE to support learning activities, confirming that "CSCL learning is more effective for students than traditional methods, and can improve students Confidence in mathematics". Chang, Y. H., Yan, Y. C., & Lu, Y. T. (2022) found in the collaborative teaching action research in the fields of social learning, art and humanities, and reading classes that teachers found the following dilemmas in the process of traditional collaborative learning; first, there are not many professional books in the library. Second, the number of computers in the library is too small, and the speed is slow. Third, when students coordinate and divide labor into groups, teachers often need to intervene to resolve disputes. Fourth, the time for making posters is not enough to diversify time from other courses for use.

The definition of learning motivation refers to the learning process, and it triggers learners to spontaneously devote themselves to learning activities and the thinking process and maintain the motivation of learning. The related learning motivation theories are divided into cognitive learning motivation theory and behaviorism. According to the theory of learning motivation, social learning-oriented learning motivation, and humanistic learning motivation theory, students must have an attitude of autonomous learning in order to be competitive in the future. Therefore, if teachers can stimulate students' learning motivation, it will be great for students' Help. Three theories that affect learning motivation include 1. Bandura's self-efficacy theory (self-efficacy), 2. Anxiety theory, 3. Pintrich's motivation theory (Ye Bing Yan, 2013)". In summary, this study will discuss five independent variables, including self-efficacy, computer typing efficiency, learning anxiety, learning attitude, and learning achievement, into the discussion that affects learning motivation.

### *Learning effectiveness*

Learning attitude and high learning motivation are very helpful to students' learning and can effectively improve students' learning effectiveness (Chang, 2010; Norris, 2011). "The indicator of learning effectiveness can be a certain change in the learner's behavior, which is then identified by subjective consciousness. Learning effectiveness can be measured by many indicators, including learning satisfaction, performance, self-evaluation, learning achievement, classroom Evaluation, participation level, self-efficacy, learning interest and learning experience, etc. (Wang Ruizhi, Liao Ling Zhu, 2008). The evaluation of learning effectiveness itself is diverse and complex and cannot be determined by achievement tests alone" (Yang Yu Lin, 2006). According to the research above, this research uses an understanding of students' learning motivation and teaching observations as a way to evaluate learning effectiveness instead of using quasi-experimental research conducted by most past researchers based on differences in learning achievement.

Zhaojie, Y. (2014) once pointed out that students' learning effectiveness can show difficulties in improving students' learning effectiveness in a short period of time. Manabu Sato (2012) emphasized that implementing a learning community in a short time can increase students' willingness to learn; however, student learning effectiveness requires long-term observation. Huang Shu Ling (2013) pointed out that the way to evaluate the effectiveness of learning can

be through long-term collection and observation of the learning process of students, rather than testing the depth of knowledge and memory strength of students at a certain point in time. Students can exchange opinions or discuss with others. Have a high willingness to learn to communicate and solve problems.

### *The ARCS motivation theory*

In the academic field, learning motivation is defined as a student's desire to invest in the learning environment (Keller & Litchfield, 2002). The influence of learning motivation on student learning effectiveness has been mentioned in many kinds of literature. It is believed to stimulate students to learn independently and perform well in learning achievement (Zimmerman, Bandura, & Martinez-Pons, 1992). Pintrich (1999) also believes that learning motivation is an important factor in improving learning effectiveness; on the contrary, a lack of learning motivation will become a hindrance to students' learning (Carson, C. H., 2006). Many works of literature in the past have confirmed that learning motivation is absolutely correlated with learning effectiveness. The ARCS motivation model proposed by Keller (1983) is evaluated with the following four elements: Attention, Relevance, Confidence, and Satisfaction. It emphasizes that the motivation of the learner must be matched with these four elements. The use of elements can achieve the effect of motivating students to learn. Therefore, this research mainly focuses on whether the use of Google presentations to assist collaborative learning can promote students' learning motivation. The ARCS motivation theory is used to compile a learning motivation scale to study whether the use of Google presentations can achieve significant differences in students' learning motivations.

The learning motivation of digital learning has a positive and significant impact on learning effectiveness (Zeng Miaoyin et al., 2011). Highly motivated students have better learning results. Students have a strong learning motivation for digital learning and can improve their learning performance (Gao Shuzhen, 2012; Chen Shunwen, Wei Jiaying, 2013). It is recommended that school administrators and teachers should pay attention to students' learning motivation, make students feel that using digital learning is valuable, and actively increase students' expectations and emotional motivation for digital learning. For the initial use of digital learning systems, teachers can increase students' motivation (Teik, O. C., 2016). Self-confidence encourages students to try to use digital learning systems and use digital learning systems in class so that students will gradually develop confidence in themselves, have more precise goals, and have a strong desire to learn the course content and have a better outcome. With high expectations and good self-efficacy, students with positive learning motivations can generate a strong will and motivation to use digital learning and use digital learning platforms to further enhance students' digital learning effectiveness (Li Yong Hui, 2017 )."

### *Research Questions*

This study completed the establishment of a computer-aided collaborative learning environment using Google presentations through implementation and improvement; and used questionnaire analysis to explore whether Google presentations are suitable for college students. After the integration interface of this study, the Google presentation can facilitate teachers to monitor students' learning process in real-time; it could also integrate the creation of the whole class in

real time, which is convenient for teachers to implement the function of synchronous discussion in the whole class. Teachers can also use the annotation function to give individual guidance to students in real-time. This study hopes to explore whether the way of using computer-assisted collaborative learning in the teaching field can realize a collaborative learning environment of "autonomous action", "communication and interaction," and "social participation". Based upon the above, there are four have been conducted as follows:

- (1) Why do undergraduate students have a good acceptance of the learning motivation of using Google Presentations?
- (2) How is the learning motivation of undergraduate students applying Google Presentations affected by their learning attitudes?
- (3) Why is the learning motivation of undergraduate students using Google Presentations affected by the discussion of self-efficacy?
- (4) How is the learning motivation of undergraduate students who use Google Presentations affected by their learning achievements?

## Methods

This study applied a quantitative research method; 200 undergraduate students who are Chinese majors in Hanoi Pedagogical University 2 will randomly be selected as participants. After developing the CSCL environment, the researchers conducted classroom experiments, then developed the scale to investigate and used SPSS to analyze various possible influences on learning motivation. In addition to the collection and analysis of quantitative data, research, and discussion are carried out by observing the reactions and performance of students in class. The independent interference variable has a significant impact. Through literature research, investigate various independent variables that may affect learning motivation, and then analyze with non-numerical statistical methods to explore learning achievement, learning anxiety, learning attitude, and discuss whether independent variables such as self-efficacy will have an impact on learning motivation to evaluate the feasibility of Google Presentation as computer-assisted collaborative learning.

The learning motivation scale of this research is based on Keller (J. Keller, 1983) ARCS (A attention, R correlation, C self-confidence, S satisfaction) learning motivation model theory and refers to Kuo, Y. (2013). The scale was revised to be used as a scale for measuring learning motivation after using Google presentations, so it has content validity. In order to better confirm whether the scale has constructed validity, the reliability analysis of each aspect is carried out, and the results are as follows: This questionnaire has 17 questions in four dimensions, namely A (attention) and R (relevant), C (confidence), S (satisfaction), the reliability analysis of the four dimensions which showed the individual reliability analysis of the four dimensions of the Learning Motivation Scale. Among them, the Cronbach's Alpha values of A (attention) and R (correlation) are 0.877 and 0.755, respectively, which are both greater than 0.7; the Cronbach's Alpha values of C (confidence) and S (satisfaction) are 0.689 and 0.601, respectively, which are both greater than 0.6; ARCS total the results of the overall reliability analysis of the



questionnaire have good construct reliability.

### Results/Findings and discussion

This study found in the literature that learning anxiety, learning attitude, willingness to use in the future, learning self-efficacy, learning achievement, and other variables may be related to learning motivation. Therefore, use correlation analysis to explore the relationship between various variables and whether the correlation is significant. The results showed that learning anxiety is significantly related to future use intention. The Pearson correlation coefficient is .852,  $P < .001$ ; learning attitude is significantly related to collaborative learning self-efficacy, Pearson correlation coefficient = .843,  $P < .001$ ; others are not significant. The learning motivation after using CSCL is not significantly related to learning anxiety, learning attitude, future willingness, discussion of self-efficacy, and learning achievement.

Significantly affect learning motivation. The Kruskal Wallis test method has been used to analyze the learning motivation of ARCS in terms of learning anxiety, learning attitude, discussion self-efficacy, typing efficiency, learning achievement, Etc. The results showed that learning anxiety, learning attitude, discussion self-efficacy, and learning achievement were ineffective. Researchers, through the result, had found that there may be the following reasons: first. Students feel that the ability to use computers to learn a second language is a fine thing, so they have a strong motivation to learn, and they dilute learning achievement and learning anxiety; learning attitude, discuss the possible negative influence of self-efficacy. Second, to learn Chinese well, students take the initiative to solve problems through collaborative learning, so they will not be disturbed by learning achievement, learning anxiety, learning attitude, and discussion self-efficacy to affect their learning motivation. Third, due to research restrictions, there are only 200 students participating in the research. Few research samples may cause the statistical analysis results to be difficult to be significant.

Table 1. Descriptive statistics

	mean	SD	N
Learning motivation	4.085	.853	200
Learning anxiety	1.794	1.155	200
Learning attitude	3.384	1.251	200
Willingness to use in the future, learning	2.125	1.208	200
Self-efficacy	3.490	1.084	200
Learning achievement	78.961	11.361	200

Table 2. Correlation analysis Chart

		learning motivation	learning anxiety	Learnin g attitude	Learning attitude, willingness to use in the future, learning	self- efficac y	Learnin g achiev ement
Learning motivation	Pearson correlation coefficient	1	-.281	-.006	-.353	.237	.075
			.164	.978	.077	.243	.716
		26	26	26	26	26	26
Learning anxiety	Pearson correlation coefficient	-.281	1	.269	.852**	.187	-.148
		.164		.184	.000	.360	.471
		26	26	26	26	26	26
Learning attitude	Pearson correlation coefficient	-.006	.269	1	.202	.843**	-.244
		.978	.184		.323	.000	.229
		26	26	26	26	26	26
Willingness to use in the future, learning	Pearson correlation coefficient	-.353	.852**	.202	1	.110	-.091
		.077	.000	.323		.594	.660
		26	26	26	26	26	26
Self- efficacy	Pearson correlation coefficient	.237	.187	.843**	.110	1	-.092
		.243	.360	.000	.594		.654
		26	26	26	26	26	26
Learning achievemen t	Pearson correlation coefficient	.075	-.148	-.244	-.091	-.092	1
		.716	.471	.229	.660	.654	
		26	26	26	26	26	26

\*\* . P <0.01

The results of the quantitative analysis showed that students were motivated to use Google Slides to implement computer-assisted collaborative learning, and they will not be affected by learning achievement, learning anxiety, learning attitude, and discussion self-efficacy. Both Ou



Yongsheng (2014) and Zhaojie, Y. (2014) mentioned in their research that many people confuse cooperative learning with the collaborative learning proposed in the "learning community" advocated by Professor Sato Gaku in Japan. But the two are different; collaborative learning can make up for the lack of cooperative learning. Collaborative learning emphasizes the relationship of "mutual learning" rather than the relationship of "mutual teaching". The "reciprocal relationship" is that students who have not yet learned take the initiative to ask students who have learned it. Through mutual discussion and mutual assistance, they are equal to each other. The "reciprocal relation" (reciprocal relation) benefits everyone. Therefore, Google Presentations can be implemented as an information integration tool for classroom teaching. Teachers can create a computer-assisted collaborative learning environment through Google slides, and students will also produce collaborative learning behaviors (Spillover Effect). For example, first, Students will encounter some operations in the process of making slides. School children will take the initiative to ask questions, and some will also actively assist. Second, although classroom discussion and interaction performance is not as expected, students like to ask questions through the Internet and respond to their classmates on the Internet. Third, some students would like to use Google slides to organize the knowledge they have learned outside of the classroom and are willing to interact and share with their classmates and get the support of some parents.

In terms of learning effectiveness, due to research limitations, this study failed to prove whether using Google Slides to implement computer-assisted collaborative learning can improve the discussion self-efficacy of school children. Researchers observed students' learning behavior in the classroom and found that it is impossible to use Google Presentations to improve learning effectiveness in a short period. Good discussion performance. The research results of Yan Yong Sen, Hu Xue Cheng, and Ke Tian Sheng (2011) found that learners' attention has a significant positive correlation with learning effectiveness, and the interactivity of digital textbooks interferes with the relationship between attention and learning effectiveness." The results of this research were also found through classroom observations. In order to solve the computer operation problems, the student union focuses on the operation of solving computer problems, which delays the main discussion activities, thus affecting the effectiveness of learning.

Based upon previous studies showed that there are many variables that affect learning effectiveness. Therefore, using Google Slides to implement a computer-assisted collaborative learning environment, it is difficult to prove whether the learning effectiveness can be significantly improved in the short term. However, it is recommended that teachers not only pay attention to the learning effectiveness of school children in terms of learning achievement, whether there will be obvious effects in the short term but also pay more attention to the spillover effects brought by the computer-assisted collaborative learning environment. The diversified learning environment provided by teachers will promote the learning motivation of schoolchildren. Schoolchildren can experience unprecedented learning methods, which will be very helpful to schoolchildren's future learning.

## Conclusion

The results of this study showed that the self-efficacy of schoolchildren's discussion in class is significantly related to the learning attitude of Mandarin. The students with high self-efficacy have higher learning attitudes than those with low learning efficiency. Therefore, it is recommended that in curriculum design, teachers should first teach students the skills of discussion effectiveness, and when the ability matures, use Google slides as a tool for computer-assisted collaborative learning. It is necessary to focus on curriculum design, supplemented by the integration of information into teaching. Teachers use Google Slides to implement the integration of information into teaching. Students can improve their information skills in the process, get opportunities for typing practice, and create a collaborative learning environment for students to learn actively. However, in the process of using Google Slides, it is inevitable that you will encounter some hardware and software difficulties and troubles. In teaching, teachers should adopt a gradual approach to allow students to gradually get in touch with and adapt to the use of computers so as to avoid learning anxiety.

This study has been implemented in language teaching and found that Google Slides is suitable for computer-assisted collaborative learning. The advantage is that it is easy to learn and use. It is recommended that teachers can also apply Google slides in the teaching of nature courses in the future, especially suitable for teaching activities that require students to collect information online and share and interact with each other in the course.

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### **Biodata**

Dr. Dinh Bich Thao is currently a Director of the Center of Quality Assurance, Testing, and Assessment, at Hanoi University of Industry, Vietnam. She received her Ph.D. degree from China Jilin University in 2015. Her research interests are Linguistics and Applied Linguistics, Chinese language teaching methodology, and Online teaching and learning.

Dr. Pham Thi Nghia Van is currently a lecturer at Hanoi Pedagogical University 2, Vietnam. She received her Ph.D. degree from China Jilin University in 2013. Her research interests are Linguistics and Applied Linguistics, Chinese language teaching methodology, Online teaching and learning.