Hacettepe Üniversitesi Eğitim Fakültesi Dergisi

Hacettepe University Journal of Education

e-ISSN: 2536-4758

The Effect of Peer Mentoring on Web 2.0 Usage Competence and Self-Efficacy Beliefs in Flipped Classrooms*

Mehmet RAMAZANOĞLU, Tayfun AKIN***, Mehmet Şahin SOLAK******

Article Information

Received: 11.06.2024

Accepted: 17.01.2025

Online First: 21.01.2025

Published: 31.01.2025

ABSTRACT

This study aims to determine the impact of peer mentoring within a flipped classroom environment on pre-service teachers' competencies in utilizing Web 2.0 tools and their self-efficacy regarding the use of rapid content development tools associated with Web 2.0. The learning environment was meticulously designed to align with the flipped classroom model, exemplifying a hybrid approach that effectively blends online and physical learning spaces. The participants consisted of students from the Faculty of Education at a public university in Turkey. Employing a pre-test/post-test control group random design, data were collected from a total of 151 participants. To assess the participants' competencies, the Scale of Competency in the Use of Web 2.0 Tools and the Web 2.0 Rapid Content Development and Self-Efficacy Scale were utilized. The collected data were analyzed using ANOVA and t-tests to identify any significant differences. The findings from this study revealed a statistically significant difference favoring the peer-mentored experimental group in terms of both their competencies in using Web 2.0 tools and their self-efficacy beliefs concerning rapid content development using Web 2.0 resources.

Keywords: Peer mentoring, flipped classroom, hybrid classroom, hybrid learning, web 2.0 tools

doi: 10.16986/HUJE.2025.536 Article Type: Research Article

Citation Information: Ramazanoğlu, M., Akın, T., & Solak, M. Ş. (2025). The effect of peer mentoring on web 2.0 usage competence and self-efficacy beliefs in flipped classrooms. *Hacettepe University Journal of Education, 40*(1), 47-59. https://doi.org/10.16986/HUJE.2025.536

1. INTRODUCTION

The development of information technologies and the spread of online environments have brought about some changes and diversity in the design and organization of learning spaces (Çakır et al., 2019; Lee et al., 2012). The integration of current technologies into the education process has also affected the preferences of teachers and students, bringing about the use of different learning methods. In the literature, there are many definitions of learning models such as hybrid learning, blended learning, distance learning, online learning, etc. (Yamagata-Lynch, 2014). Hybrid learning and blended learning, which have been commonly used within the ICT-enhanced instruction, are among the most preferred approaches (Kostolanyova et al., 2015). It is seen that the terms blended learning and hybrid learning are used interchangeably in the literature (Martyn, 2003; Ryan et al., 2016). The hybrid learning model continues to top the trend lists in the Horizon report due to its suitability.

flexibility, and convenience for students' demand for access to learning anytime, anywhere (Pelletier et al., 2021; Horizon Report, 2024). When hybrid learning or blended learning is mentioned, the first thing that comes to mind is the combination of face-to-face education and online environments. However, in designing a hybrid environment, it becomes more important to choose the best environment for implementation rather than integrating online and face-to-face environments (Gedik et al., 2013). Contrary to popular belief, the blended learning approach is based on the principle of utilizing face-to-face interaction opportunities between student-student and student-teacher as much as possible. Therefore, in blended learning in general, the balance between face-to-face learning and online learning often needs to be well grounded. Establishing this learning environment balance may vary depending on the course to be taught (Yapıcı, 2016). While the need for face-to-face learning is increasing, especially in some practice-based courses, a largely online learning environment will be suitable for some courses

* The study was approved by the research team's university ethics committee of the Siirt University (Approval Number/ID: 6045/2023).

** Assoc. Prof. Dr., Siirt University, Faculty of Education, Department of Educational Sciences, Division of Instructional Technologies, Siirt-TÜRKİYE. e-mail: m.ramazanoglu@siirt.edu.tr (ORCID: 0000-0001-6860-0895)

*** Assist. Prof. Dr., Siirt University, Faculty of Education, Department of Educational Sciences, Division of Instructional Technologies, Siirt-TÜRKİYE. e-mail: tayfun.akin@siirt.edu.tr (ORCID: 0000-0001-5364-6102)

**** Assist. Prof. Dr., Kahramanmaraş İstiklal University, Faculty of Communication, Department of Digital Game Design, Kahramanmaraş-TüRKİYE. e-mail: mehmetsahin.solak@istiklal.edu.tr (ORCID: 0000-0003-2528-7960)

that require frequent content repetition. Another alternative is to use these two methods equally in different courses. Studies show that hybrid models are effective in terms of success, while there are also opinions claiming the opposite. It has been observed that students in hybrid environments are less successful than students in traditional environments due to reasons such as students' sense of participation in the class and coping with challenging concepts alone in online environments (Zalloum, 2021). Thus, it is necessary to carefully design both informal learning environments and formal learning environments within the hybrid learning model.

Individualized learning styles, proper instructional technology, and the application of appropriate skills to the right participant at the right time are necessary for achieving success in terms of the learning outcomes of each person in a blended learning environment. No matter how complex, advanced, or useful an educational technique appears to be, it is useless if it does not satisfy the needs of the learners (Balci & Soran, 2009). Web 2.0 tools, most of which are free, are the leading technologies that allow the hybrid learning approach to be used in classes. Known as internet-based applications, Web 2.0 technology was designed to allow users to interact and collaborate in a virtual community (O'Reilly, 2005). These technologies offer various advantages to both teachers and students. Teachers use current technologies not only to enrich and embellish classes but also to easily organize teaching materials and activities (Keengwe et al., 2008). The adoption of Web 2.0 technologies not only enables students to share, collaborate and participate between asynchronous and synchronous, but also brings with it an unlimited learning breadth (Lee et al., 2012). Learning and teaching activities supported by Web 2.0 technologies are incorporated into higher education programs around the world (Efe, 2015). At this point, especially the learning process enriched by various teaching methods with Web 2.0 technologies offered many conveniences in terms of combining online and physical environments (Urias et al., 2018). It is commonly known that there are a plethora of online resources and tools available for educators and learners alike. Considering hybrid learning environments, developing web 2.0 tools and flipped classrooms, which emerged as a different approach in combining online and physical environments, can be preferred for the presentation of course content and activities. The use of Web 2.0 tools widely used in flipped teaching and providing easy and rapid access to information without time and space restrictions is becoming more popular. Flipped classrooms refer to a learning method in which learning materials related to the class and content are examined by the students through videos before class and learning outcomes are consolidated (Gündüz & Akkoyunlu, 2019). Apart from allowing students to interact and collaborate with their peers, the relevant method provides more opportunities for classroom activities and learning by doing. Flipped classrooms have both advantages and disadvantages. Increasing the time students spend in class allows them to use their learning independently and receive guidance during the process (Baston, 2016). Another advantage is that it helps the assimilation of information by solving the time problem in the classroom and allocating more time to activities such as discussion and debate (Galindo-Dominguez, 2021). It is assumed that students gain conceptual knowledge through videos sent for theoretical sections. Additionally, challenges such as developing course materials, designing and producing instructional videos, student adaptation, and motivation are known as the weaknesses of flipped classrooms (Campbell, 2016). In a study on students' opinions about flipped classrooms, students reported that applied activities provide more permanent learning and the advantage of repeating the topics whenever they want (Ramazanoğlu, 2020).

Web 2.0 tools are being used more and more in educational settings because of their easy and quick access to information, time and space intervals, and other capabilities. In order to effectively use web technologies, one must possess a certain set of skills, talents, and competencies. Technology proficiency has been defined as the ability to use and integrate technologies in teaching and learning (Giles et al., 2020). In this context, preservice teachers are supposed to improve themselves as effective users of technology. It is known that the self-efficacy of individuals in learning is critical (Hall & Hall, 2010). Bandura (1995) defines self-efficacy as the belief in one’s ability to organise and execute the courses of action so as to manage prospective situations.”. Strong self-efficacy beliefs enable people to overcome hard circumstances more successfully than weak beliefs, which cause people to focus on negative aspects of themselves and perceive difficult tasks as a threat to their safety (Bandura, 1994). It is therefore possible to claim that using technological practice and experience to increase self-efficacy is a good idea. In the end, pre-service teachers who are not tech-savvy will probably find it difficult to incorporate technology into their lessons and use it effectively. As a result, pupils will only get a limited amount of exposure to technology in the classroom (Giles, Baker & Willis, 2020). The ability of these experiences to have a positive effect on self-efficacy depends on successful past performances (Tschannen-Moran & McMaster, 2009; Huang et al., 2020). It is known that the duration of computer usage positively affects the tendency to use a technology and the adoption of new technologies (Khurram & Akgün, 2022). The duration of computer usage can also be considered as experience and expertise. As computer usage time increases, online learning self-efficacy increases (Gönen, 2024). Additionally, it has been observed that the duration of computer usage affects computer experience and attitudes towards computers (Yalman & Tunga, 2012). Using peer mentorship to raise these students' self-efficacy and self-esteem is one strategy to increase retention rates (Krisi & Nagar, 2021), which suggests that peer mentoring is influential on self-efficacy. As a matter of fact, Bandura (1994) emphasized that peer relations have a great role in the development of self-efficacy.

According to social learning theory, humans can pick up behaviors through observation and apply them to new circumstances Bandura and Walter's (1977). Considering the pedagogical use of Web 2.0 tools, it can be argued that teachers or students can be influenced by their peers. The four components of peer coaching—academic, technical, emotional, and reflective—for teachers' professional growth were summed up by Zhang, Liu, and Wang (2017). It has been reported that integration of web 2.0 technologies into education can contribute to both collaboration and an active learning environment (Vaughan, 2010).

Peer mentorship has been shown to significantly alter self-efficacy, according to Goker (2006). In their systematic review of the literature, Pierce et al. (2024) found multiple studies demonstrating the effective impact of peer mentoring on self-efficacy. Moreover, the effectiveness of peer mentoring in flipped classrooms can be influenced by various factors, including students' personalities and their engagement levels. Ramadoni's (2023) study revealed that personality traits significantly affect students' performance in calculus courses when utilizing the peer teaching flipped classroom model, with extroverted students demonstrating superior conceptual understanding compared to their introverted peers. This suggests that educators should consider the diverse personality traits of students when implementing peer mentoring strategies in flipped classrooms to maximize their effectiveness.

The research review emphasizes how peer mentoring and teamwork both affect self-efficacy. Peer mentoring also promotes collaboration and companionship between pre-service teachers and their colleagues (Slater & Simmons, 2001). Cooperative idea mapping via the web has been shown to have a more significant impact on self-efficacy (Chu, Hwang & Liang, 2014). In'am & Sutrisno (2021) stated that students' motivation and sense of self-efficacy about the mathematics learning process are both positively impacted by the cooperative learning paradigm. "Students often feel unsupported, dissatisfied, and disconnected in their program and that such issues may be mitigated by peer mentoring," according to Zhang et al. (2021). Similar to this, students in the beginning computer science course thought that their peers were accessible, adaptable, and innovative in their efforts to support their learning (Pon-Barry et al., 2017). However, research by Al-Said et al. (2023) highlights the possible drawbacks of flipped classrooms, such as the inability to study the subject on one's own, a lot of content, and technical issues.

In research on peer mentoring, Kemer and Lowenthal (2020) found that it is an effective way to support faculty members' use of technology, and Giles, Baker, and Willis (2020) found that it has a positive impact on teacher candidates' technology use proficiency. In the study conducted by OH et al. (2022), it was revealed that peer guidance increases learning participation in flipped classrooms and facilitates the all-round development of students. Sukma et al. demonstrated that the peer-teaching flipped classroom model outperformed traditional discovery learning methods in improving students' conceptual understanding of mathematical concepts. Their findings suggest that students engaged in peer teaching are more interactive and have greater opportunities to articulate their understanding, thereby deepening their learning experience (Sukma et al., 2022).

In flipped classrooms, peer mentoring can be employed to help students develop their digital skills and effectively utilize these technologies. Peer mentoring fosters a positive learning environment among students, encouraging them to provide support to each other (Flores & Estudillo, 2018). In flipped classrooms, this process is further strengthened as students take on more responsibility and actively manage their own learning. Students with experience with technology may teach others by showing them how to utilize Web 2.0 technologies. Peer mentorship has the potential to further improve student interaction. Flipping the classroom allows students to engage with the content at their own pace, which promotes personalized learning. In addition to learning from their peers, peer teaching offers an additional level of interaction that helps students develop their leadership and interpersonal skills. A vibrant learning environment that encourages student participation and teamwork is created when these two strategies are combined (Yang & Wattanapayungkul, 2024). Peer mentoring can also address particular needs by offering tailored advice based on peer trust. Parallel to this perspective, Lu (2010) examined eight peer coaching studies that were relevant to student teacher education and discovered that peer coaching helped student teachers learn and develop their instructional skills, supported their professional development, and offered them effective support.
Generally, considering the literature, it is emphasized that both face-to-face and online environments should be carefully designed in flipped classrooms (Al-Said et al., 2023; Baston, 2016; Campbell, 2016; Gündüz & Akkoyunlu, 2019; Ramadoni, 2023; Yang & Wattanapayungkul, 2024). In this context, when the literature was reviewed, no study was found on the effect of peer guidance in flipped classes on web 2.0 usage competence and content development self-efficacy. From this perspective, it can be said that facilitating peer collaboration in the classroom will contribute to the literature by offering a different approach to participation in classroom activities and reinforcing what has been learned.

1.2. Purpose of the Study

The use of Web 2.0 technologies in the classroom has been observed to facilitate the organization of the instructional process, create an interactive learning environment, enable easy sharing and collaboration, prepare multimedia materials, and enhance student participation, thus enriching the learning experience. Peer support is important in sharing ideas, supporting and teaching each other, developing new skills, or solving problems (Xu et al., 2021). In addition, it has been determined that peer mentoring contributes to technology usage (Kemer and Lowenthal 2020) and has an effect on technology usage competence (Giles, Baker and Willis, 2020). With these benefits in mind, it's clear that peer mentorship may contribute significantly to the usage of Web 2.0 technologies. Students can become more adept at using technology through peer engagement and mentoring, which will better equip them for life in the digital age. Pre-service teachers are expected to do their job in the future with active and effective use of such technologies, which enrich educational activities (Giles, Baker and Willis, 2020). Based on this, the aim of this study is to investigate the effect of peer guidance in a flipped classroom environment on pre-service teachers' competencies in using Web 2.0 tools and their self-efficacy in using Web 2.0 rapid content development tools.

1.3. Problem of the Study

This study was designed to determine the impact of peer mentoring in a flipped classroom environment on pre-service teachers' competence in using Web 2.0 tools and their self-efficacy in using rapid content development tools of Web 2.0.

1.3.1. Sub-problems of the study

In line with the problem of the study, questions were as follows:

1. Does the cooperative flipped classroom model affect the participant group's competency in the use of Web 2.0 efficacy and self-efficacy beliefs?
2. Does peer-mentoring have a significant effect on the competency in the use of Web 2.0 and self-efficacy beliefs about the cooperative flipped classroom model?
3. In the cooperative flipped classroom model, is there a significant difference in terms of the competency in the use of Web 2.0 and self-efficacy beliefs according to the duration of computer use of the participant group?

2. METHODOLOGY

This section includes the research design, participants, data collection tool and data analysis of the research.

2.1. Research Design

A pre-test/post-test control group random design was used to investigate the effect of peer mentoring in the context of dependent variables in flipped classrooms. Also known as “intervention studies” or “group comparison studies”. In experimental designs, it is determined whether participant results have undergone a change due to an activity or teaching tool in the studies conducted by researchers who conduct quantitative research (Creswell 2012). Random assignment was used to assign the participants to the control and experimental groups through a lottery method (Creswell, 2012). In addition to this, the old-fashioned way of drawing cards was used to determine the group and the week, respectively, for the preparation of their videos. Thus, it can be suggested that the investigation is in the form of a true experimental design (Gravetter & Wallnau, 2007; Ross & Morrison, 2004).

2.2. Participants

The study group included sophomores enrolled in different departments at a public university during the academic year of 2023-2024 and taking the "Instructional Technologies" course. The demographic characteristics of participants were presented in Table 1.

Table 1.
The demographic characteristics of participants

Group	Gender	f	%	Department	f	%	The duration of computer use	f	%
Experimental	Female	46	65.7	Classroom Teaching	13	18.6	None	20	28.6
	Male	24	34.3	Elementary Mathematics	20	28.6	1 – 3 Years	13	18.6
				Turkish Language	12	17.1	4 – 6 Years	19	27.1
				English Language	25	35.7	7 – 10 Years	12	17.1
							11+ Years	6	8.6
	Total	**70**	**100**						
Control	Female	58	71.6	Classroom Teaching	27	33.3	None	23	28.4
	Male	23	28.4	Elementary Mathematics	20	24.7	1 – 3 Years	20	24.7
				Turkish Language	19	23.5	4 – 6 Years	13	16.0
				English Language	15	18.5	7 – 10 Years	16	19.8
	Total	**81**	**100**				11+ Years	9	11.1

At the beginning of the study, data were collected from 185 participants. However, after it was determined that 20 of them did not participate in the pre-test and post-test, the data of 165 participants were included in the study. Besides, data belonging to 11 of 165 participants were excluded from the data set due to a potentially negative effect on the data set with issues such as giving consecutive answers, leaving blank, or filling in more than one. Finally, the extreme values (three data) in the Q-Q, P-P plots of the normal distribution were discarded. The data of the remaining 151 participants, whose details are given in the table in its final form, constituted the study group.

2.3. Implementation Process

Before the implementation, student groups were assigned through the lottery method. Three instructors teaching the "Instructional Technologies" course had an experimental and a control group. Despite having different instructors, they held departmental meetings before the implementation process to decide on a common lesson schedule, discussing which teaching methods would be used in which weeks. Additionally, each instructor used a single document for the lesson content. In the control group, classroom activities involving Web 2.0 tools were conducted according to a common schedule that had been previously agreed upon by the instructors. In the experimental group, Web 2.0 tool activities in the classroom were carried out under the mentorship of collaborative working groups. During the classroom activity, neither peers nor lecturers gave any lectures. The implementation process was presented in Figure 1.

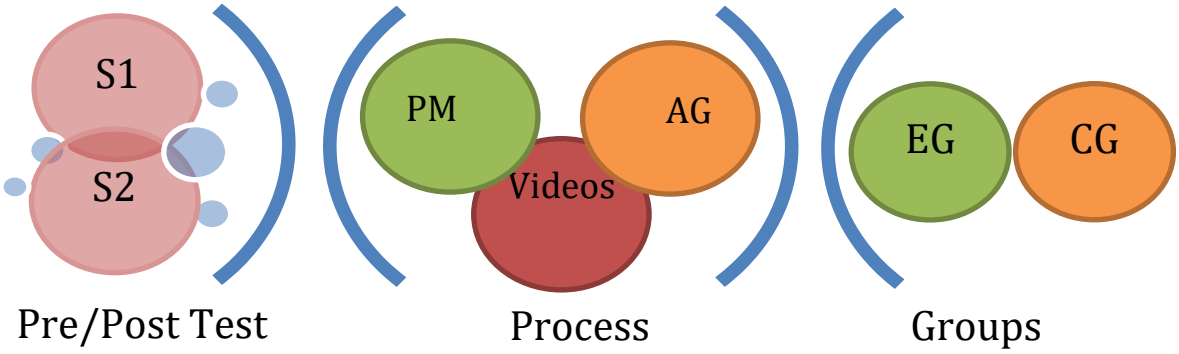

Figure 1. Implementation process
S1: The scale of competency in the use of Web 2.0 tools, S2: Web 2.0 rapid content development and self-efficacy belief scale, PM: Peer mentoring, AG: Academician guidance, Videos: Flipped classroom videos for Web 2.0 tools driven by collaborative groups Videos of the Cooperative Study Group on Web 2.0 tools

The implementation lasted 8 weeks, while the cooperative flipped learning lasted 2 hours of class each week. Web 2.0 tools to be used in flipped classrooms (creating virtual classrooms, conducting surveys and quizzes, solving questions, preparing presentations and entertaining videos, preparing posters and cartoons, etc.) were preferred.

Cooperative study groups, including 3-5 students were formed by the instructors. It is reported that cooperative groups with 3–4 participants are often preferred (Kagan, 1994). The videos prepared by the cooperative study groups formed by the instructors were created by following the process in many studies in the literature on video production. This process consists of three steps: pre-production, production, and post-production (Sunarya, Purbayani, & Handayani, 2021; Martin & Betrus, 2019; da Silva et al., 2017; Hobbs et al., 2013).

During the pre-production step, cooperative student groups were determined with due care to ensure that group members were heterogeneous. To give equal time to the cooperative study groups during the production of videos, the groups were given the next Web 2.0 tool each week before class. No group was allocated more time than the others.
During the production step, the screen recording programs (Bandicam or Iobit Screen Recorder) to be used while producing videos were introduced to the student groups. In addition, they were asked to prepare the videos in three parts. Depending on the Web 2.0 tool given for this task, the following questions were asked:

- What is the Web 2.0 tool (Edmodo, Kahoot, etc.)? How is it used?
- How do you subscribe to the Web 2.0 tool?
- The Web 2.0 tool and the classroom activity.

In this context, the students were asked to distribute the tasks within the cooperative study group and to report the task to be performed by each member. Some of the group members prepared their video content and some recorded their videos through the screen recording program, while others planned the classroom activity. After completing their videos, the group presented the pre-prepared content to the instructor. Following the feedback of the instructors, the videos took their final forms.

In the last step, the group members were asked to upload the videos separately to the YouTube channel, which was created by the instructor at the beginning of the implementation, based on the steps requested above. The links to the videos uploaded to the YouTube channels were shared in the class communication group. Before class, all students were allowed to watch the videos prepared by their peers.

2.4. Data Collection Tool

As data collection tools, the Scale of Competency in the Use of Web 2.0 Tools and the Web 2.0 Rapid Content Development and Self-Efficacy Scale were applied to both groups before the implementation and after the eight-week implementation conducted with the cooperative study group videos as part of the flipped classroom implementation. Explanations about the structure, validity, and reliability of the scales are given below. Computer usage time has been regarded as a demographic variable during this study method because Web 2.0 apps' content creation interfaces are incompatible with mobile devices.

2.4.1. The Scale of Competency in the Use of Web 2.0 Tools

The scale was developed by Çelik (2021) and was graded on a five-point Likert scale (1: never, 5: always) to measure the proficiency of prospective teachers in using Web 2.0 tools. The scale consists of 39 items and a single factor structure, explains 60.44% of the total variance in the single-factor structure, and has a very high internal reliability value (α =.98). In this study, the internal reliability value was (α =.976).

2.4.2. The Web 2.0 Rapid Content Development Self-Efficacy Scale

The scale was developed by Birişçi, Kul, Aksu, Akaslan, and Çelik (2018) in a five-point Likert scale (1: strongly disagree; 5: strongly agree). The scale explains 65.63% of the total variance and consists of three dimensions: "preparation", "presentation", and "evaluation", and has a very internal reliability value (α =.955). In this study, the internal reliability value was (α =.966). In addition, the lowest score to be obtained from the scale consisting of 21 items is 21, while the highest score is 105. The mean score calculated by dividing the obtained score by the total number of items gives information about the self-efficacy beliefs of individuals in using Web 2.0 tools as follows: If the mean score is below 2.6, ranges between 2.6 and 3.4, and above 3.4, it is low, moderate, and high, respectively.

2.5. Data Analysis

The data were transferred to the SPSS 26 program. The accuracy of the transferred data was also meticulously examined. The test results should be tested to determine whether there is a normal distribution or not before an analysis. For this reason, the Shapiro-Wilk normality test was applied, and skewness and kurtosis values of data groups were examined. The results of the test showed that the kurtosis skewness values were ranged between ± 2, which indicates that the values are accepted as shown in the literature (Kerr, Hall & Kozub, 2002; George & Mallery, 2019). Furthermore, a boxplot was used to see the distribution slope of the obtained data. Accordingly, data with extreme values were not included in the analysis. All these processes show that the data provide normality assumptions and are suitable for parametric tests. Evaluation of all statistics revealed that the data showed a normal distribution. Statistical properties of the data set, including frequency, percentage, standard deviation, arithmetic means, and variance values, were calculated. Assuming that the variances of the data could be different, independent samples t-tests and relational t-tests were used. The ANOVA test was used to determine the difference between variables with more than one category, while the Bonferroni test was used to determine the difference between groups. The significance level of p was taken as 5% in the study.

3. FINDINGS

In this section, the findings are presented based on the order of the research questions of the study.

3.1. Does the cooperative flipped classroom model affect the participant group's competency in the use of Web 2.0 efficacy and self-efficacy beliefs?

Table 2. summarizes relational (t-test) results for the participants in the experimental and control groups after and before the implementation of the cooperative flipped classroom model.

Table 2.
Results of the implementation of the cooperative flipped classroom model (t-test).

Group	Factor	Test	Mean	SD	t	p
*Experimental	Competency	Post-test	3.618	0.698	16.268	.000
		Pre-test	1.907	0.817		
	Preparation	Post-test	3.751	0.650	16.042	.000
		Pre-test	2.109	0.693		
	Presentation	Post-test	3.782	0.746	10.234	.000
		Pre-test	2.418	0.901		
	Evaluation	Post-test	3.775	0.735	14.650	.000
		Pre-test	2.121	0.756		

**Control	Competency	Post-test	3.279	0.583	12.983	.000
		Pre-test	1.974	0.748		
	Preparation	Post-test	3.488	0.590	11.608	.000
		Pre-test	2.355	0.715		
	Presentation	Post-test	3.596	0.674	8.410	.000
		Pre-test	2.602	0.905		
	Evaluation	Post-test	3.562	0.600	11.791	.000
		Pre-test	2.374	0.729		

**Experimental Group (N = 70), **Control Group (N = 81), p<.05*

Table 2 highlights that there was a significant difference between the mean scores of the participants' competencies in the use of Web 2.0 tools both in terms of the experimental group t(69) = 16,268, p <.05 and the control group t(80) = 12,983, p <.05 after and before the implementation of the cooperative flipped classroom model. As regards the web 2.0 rapid content development self-efficacy beliefs of the participants, there was a significant difference between the mean scores both in terms of the experimental group (preparation t(69) = 16,042, p <.05, presentation t(69) = 10,234, p <.05, evaluation t(69) = 14,650, p<.05) and the control group (preparation t(80) = 11,608, p <.05, presentation t(80) = 8.410, p <.05, evaluation t(80) = 11,791, p <.05) before and after the implementation of the cooperative flipped classroom model. This finding shows that the implementation of the cooperative flipped classroom model affected both groups' competencies in the use of Web 2.0 tools and their beliefs about preparation, presentation, and evaluation.

3.2. Does peer-mentoring have a significant effect on the competency in the use of Web 2.0 and self-efficacy beliefs about the cooperative flipped classroom model?

Table 3 summarizes the results of the implementation of the cooperative flipped classroom model of the participants in the experimental and control groups according to the variable of group (t-test)

Table 3.
Results of the implementation of the cooperative flipped classroom model according to the variable of group (t-test).

Factor	Groups	Mean	SD	t	p
Competency	Experimental	1.711	0.880	2.781	.006
	Control	1.305	0.904		
Preparation	Experimental	1.642	0.856	3.590	.000
	Control	1.134	0.879		
Presentation	Experimental	1.364	1.115	2.087	.039
	Control	0.994	1.064		
Evaluation	Experimental	1.654	0.944	3.084	.002
	Control	1.188	0.907		

** Experimental Group (N = 70), Control Group (N = 81), p<.05*

Table 3 highlights that there was a significant difference in the factor of competencies in the use of Web 2.0 tools t(149) = 2,781, p <.05 according to the variable of group. Mean ranks were in favour of the experimental group. There was also a significant difference in terms of the web 2.0 rapid content development-self-efficacy beliefs (preparation t(149) = 3,590, p <.05, presentation t(149) = 2,087, p <.05, evaluation t(149) = 3,084, p <.05). In this regard, mean ranks were in favour of the experimental group, indicating that the effect of the implementation of the cooperative flipped classroom model was higher in the control group in terms of competencies in the use of Web 2.0 tools and beliefs about preparation, presentation, and evaluation.

3.3. In the cooperative flipped classroom model, is there a significant difference in terms of the competency in the use of Web 2.0 and self-efficacy beliefs according to the duration of computer use of the participant group?

Table 4 summarizes the results of the implementation of the cooperative flipped classroom model of the participants in the experimental and control groups according to the variable of the duration of computer use (t-test).

Table 4.
Results of the implementation of the cooperative flipped classroom model according to the variable of the duration of computer use (ANOVA).

Group	Factor	The Duration of Computer Use	N	Mean	Sd	F	p	Difference
Experimental	Competency	None	20	1.465	0.574	.750	.562	None
		1–3 Years	13	1.870	0.874			
		4–6 Years	19	1.664	0.808			
		7–10 Years	12	1.918	1.016			
		11+ Years	6	1.920	1.588			
	Preparation	None	20	1.201	0.687	4.166	.005*	1-4
		1–3 Years	13	1.689	0.681			1-5
		4–6 Years	19	1.550	0.792			
		7–10 Years	12	2.058	0.946			
		11+ Years	6	2.475	0.958			
	Presentation	None	20	1.000	0.774	2.339	.064	None
		1–3 Years	13	1.481	0.787			
		4–6 Years	19	1.145	1.049			
		7–10 Years	12	1.708	1.414			
		11+ Years	6	2.333	1.700			
	Evaluation	None	20	1.188	0.990	3.233	.018*	1-5
		1–3 Years	13	1.692	0.730			
		4–6 Years	19	1.645	0.814			
		7–10 Years	12	1.958	1.054			
		11+ Years	6	2.542	0.660			
Control	Competency	None	23	1.183	1.155	1.031	.397	None
		1–3 Years	20	1.446	0.649			
		4–6 Years	13	0.956	0.786			
		7–10 Years	16	1.417	0.957			
		11+ Years	9	1.611	0.666			
	Preparation	None	23	0.978	0.943	1.320	.270	None
		1–3 Years	20	1.042	0.693			
		4–6 Years	13	0.929	0.698			
		7–10 Years	16	1.401	1.130			
		11+ Years	9	1.556	0.712			
	Presentation	None	23	0.815	0.966	1.649	.171	None
		1–3 Years	20	0.788	0.901			
		4–6 Years	13	0.769	1.273			
		7–10 Years	16	1.453	1.239			
		11+ Years	9	1.417	0.781			
	Evaluation	None	23	0.826	0.972	3.230	.017*	1-5
		1–3 Years	20	1.263	0.610			
		4–6 Years	13	0.865	0.704			
		7–10 Years	16	1.563	1.112			
		11+ Years	9	1.750	0.696			

** P< .05, Df= 3*

Table 4 shows that considering competencies in the use of web 2.0 tools, there was no significant difference in terms of the means of the experimental group F = 0,750, p <.05 and the control group F = 1,031, p <.05 according to the variable of the duration of computer use before and after the implementation. On the other hand, while there was no significant difference in terms of the mean scores of the control group according to the web 2.0 rapid content development-self-efficacy beliefs about presentation F = 2,339, p <.05, there was a significant difference in preparation F = 0,48, p <.05 and evaluation F = 0,21, p <.05. According to the Bonferroni test results conducted to reveal the source of the difference, it was found that the scores of the groups that used computers for 7 to 10 years and +11 were higher in terms of preparation than the scores of the group that did not use computers at all. The scores of the group that included participants who used computers for +11 years were higher than the scores of the group that did not use computers at all.

Considering the web 2.0 rapid content development-self-efficacy beliefs, no significant difference was found in terms of the mean scores of the control group in preparation F = 0,270, p <.05 and presentation F = 0,171, p <.05 while there was a significant difference in evaluation F = 0.017, p <.05 after and before the implementation of the cooperative flipped classroom model. The Bonferroni test results conducted to reveal the source of the difference demonstrated that the scores of the group with a history of +11 years of computer use were higher than the scores of the group without a history of computer use. This

shows that the implementation of the cooperative flipped classroom model mainly affects preparation and evaluation of the experimental participant group and evaluation of the control group.

4. RESULTS, DISCUSSION AND RECOMMENDATIONS

This study is mainly designed to shed light on the effect of peer mentoring on the competencies in the use of web 2.0 tools and web 2.0 rapid content development-self-efficacy beliefs in the context of the cooperative flipped classroom model.

A significant difference emerged from the implementation of the cooperative flipped classroom model in terms of competencies in the use of Web 2.0 tools and beliefs about preparation, presentation, and evaluation. It can be argued that the relevant model positively influences both peer mentoring and teacher guidance. Peer coaching is a professional development strategy for educators that entails instructors providing feedback and encouragement to one another in order to enhance their educational strategies and techniques (Pearce et al., 2019). The literature review demonstrates that cooperative learning has a beneficial influence on self-efficacy, and both Chu, Hwang & Liang (2014) and In'am & Sutrisno (2021) support this hypothesis. This difference is regarded as natural because both groups work together in the theoretical phase.

One may also notice that there was a significant difference in favour of the experimental participant group when it comes to competencies in the use of Web 2.0 tools and beliefs about preparation, presentation, and evaluation. It can also be pointed out that peer mentoring has a higher level of effect than teacher guidance when applying the flipped classroom model, a result that overlaps with other results in the literature. While Pon-Barry, Packard & John (2017) emphasized that peer mentoring is a valuable resource in developing students' self-efficacy, Zhang, Carroll, Li, and Lin (2021) reported that students would not leave programs if they were provided with technology-supported peer mentoring. It has been stated that peer relations have an effect on the development of self-efficacy (Bandura, 1994; Göker, 2006). As a matter of fact, it is stated that peer support contributes to the preparation phase of a course (Zwart et al., 2009). The effectiveness of peer mentoring in flipped classrooms is further underscored by studies examining the role of peer instruction in various disciplines. For example, Mclean et al. (2016) found that students reported the most positive experiences in flipped classrooms stemmed from purposeful interactions with peers, which allowed them to apply content in meaningful ways during class time. This aligns with the findings of Zhang, who noted that flipped classrooms facilitate higher-order thinking and promote collaborative learning, essential components for effective peer mentoring (Zhang, 2024). Peer mentors can set an example of professional conduct and productive study habits, both of which are critical for student achievement, thanks to this methodical approach. It is also thought that peer mentoring can continue outside of class in groups with classmates. Therefore, it can be argued that the support provided outside the classroom was effective in revealing this difference in the experimental group. As a matter of fact, Xu et al. (2021) found in their study that peer support outside the classroom increased interaction and increased learning.

It was also observed that this did create no significant difference in terms of the experimental participant group, the duration of computer use, competencies in the use of Web 2.0 tools, and beliefs about making presentations, while there was a significant difference in terms of preparation and evaluation. In the control participant group, it was observed that a significant difference was found only in the terms of evaluation. It was found that the difference in the experimental participant group was between the group that did not use a computer and the groups that used a computer for 7–10 years and 11+ years, while in the control participant group, the difference was found between the group that did not use a computer and the group that used a computer for 11+ years. Based on the results showing differences between those using computers for a long time and those with no history of computer use, it affects preparation and evaluation beliefs of the participants who use computers for a long time under peer mentoring and evaluation beliefs of the participants who use computers for a long time under the guidance of the teacher. Indeed, from the studies conducted, we see that as the duration of computer usage increases, both computer attitudes and self-efficacy are positively affected (Gönen, 2024; Yalman & Tunga, 2012). The past experiences have a positive impact on self-efficacy (Bandura, 1994; Huang et al., 2020; Tschannen-Moran and McMaster, 2009). In addition to mastery experience, peer mentoring, which plays an important role in the continuity of success, is a method that is effective on self-efficacy (Krisi & Nagar, 2021). Therefore, it can be argued that this difference in both preparation and evaluation dimensions in the peer mentoring group is an expected result.

It was concluded that in general, the implementation of the cooperative flipped classroom model under both peer mentoring and teacher guidance had an effect on the participant group's competencies in the use of web 2.0 tools and web 2.0 rapid content development self-efficacy beliefs, but the effect of peer mentoring was higher. In the context of the duration of computer use, the belief about preparation for computer use for a long time under peer mentoring and evaluation increased, whereas the belief about evaluation increased as the time spent under the guidance of the teacher increased. In light of all considerations, some recommendations have been given below: In similar studies on the flipped classroom model, the effect of peer mentoring can be examined without using the cooperative learning model. In the theoretical part, the effect of interactive learning environments can be examined in similar studies on the flipped classroom model.

5. LIMITATIONS

In this study, the implementation process being carried out by three different academics and the use of YouTube as the learning environment are considered among the study's limitations. Although a common teaching method, course schedule, and content were determined, differing methodological approaches among the academics and the content diversity on YouTube could lead to potential issues with standardization. Furthermore, the structure of YouTube may limit the observation processes of participants, potentially restricting their ability to engage in in-class activities. In this context, the findings of the study should be interpreted solely within the scope of this platform and the methods used, and these limitations should be considered when generalizing the results.

Research and Publication Ethics Statement

All the rules specified in the Higher Education Institutions Scientific Research and Publication Ethics Directive have been complied with in the entire process, from the planning and implementation of this research to the data collection and analysis, and no damage has been done to the data set. Ethics and citation rules were followed during the writing process, and it was not sent to any other academic publication journal for evaluation. The study was approved by the research team's university ethics committee of the Siirt University (Approval Number/ID: 6045/2023).

Contribution Rates of Authors to the Article

All authors contributed equally.

Statement of Interest

There is no conflict of interest between the authors.

6. REFERENCES

Al-Said, K., Krapotkina, I., Gazizova, F., & Maslennikova, N. (2023). Distance learning: studying the efficiency of implementing flipped classroom technology in the educational system. *Education and Information Technologies*, *28*(10), 13689-13712. doi: https://doi.org/10.1007/s10639-023-11711-x

Balci, M., & Soran, H. (2009). Students' opinions on blended learning. *Turkish Online Journal of Distance Education, 10* (1), 21-35.

Bandura, A. (1994). Self-efficacy. In V. S. Ramachaudran (Ed.), Encyclopedia of human behavior (Vol. 4, pp. 71-81). New York: Academic Press. (Reprinted in H. Friedman [Ed.], *Encyclopedia of mental health.* San Diego: Academic Press, 1998). https://www.uky.edu/~eushe2/Bandura/BanEncy.html

Bandura, A. (1995). *Self-efficacy in changing societies,* Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9780511527692

Bandura, A., & Walters, R. H. (1977). *Social learning theory* (Vol. 1). Prentice Hall: Englewood Cliffs.

Baston, J. (2016). A flipped learning model. *Teaching Geography*, *41*(2), 70-71. https://www.jstor.org/stable/26455178

Birişçi, S., Ümit, K., Zeki, A., Akaslan, D., & Çelik, S. (2018). Web 2.0 hızlı içerik geliştirme öz-yeterlik algısını belirlemeye yönelik ölçek (W2ÖYAÖ) geliştirme çalışması. *Eğitim Teknolojisi Kuram ve Uygulama, 8*(1), 187-208. https://doi.org/10.17943/etku.335164

Campbell, K. S. (2016). Flipping to Teach the Conceptual Foundations of Successful Workplace Writing. *Business and Professional Communication Quarterly, 79*(1), 54-67. https://doi.org/10.1177/2329490615608847

Chu, H. C., Hwang, G. J., & Liang, Y. R. (2014). A cooperative computerized concept-mapping approach to improving students' learning performance in web-based information-seeking activities. *Journal of Computers in Education, 1*(1), 19-33. https://doi.org/10.1007/s40692-014-0001-2

Creswell, J. W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (4th ed.). Upper Saddle River, NJ: Pearson.

Çakır, R., Adsay, C., & Uğur, Ö. A. (2019). Ters-yüz sınıf modelinin ve web 2.0 yazılımlarının bilgisayarca düşünme becerisi, etkinlik tecrübesi ve uzamsal düşünme becerisine etkisi. *Mersin Üniversitesi Eğitim Fakültesi Dergisi, 15*(3), 845-866. https://doi.org/10.17860/mersinefd.528764

Çelik, T. (2021). Web 2.0 Araçları Kullanımı Yetkinliği Ölçeği Geliştirme Çalışması. Pamukkale Üniversitesi Eğitim Fakültesi Dergisi, (51), 449-478. https://doi.org/10.9779/pauefd.700181

Efe, H. A. (2015). The relation between science student teachers' educational use of web 2.0 technologies and their computer self-efficacy. *Journal of Baltic Science Education, 14*(1), 142-154. https://doi.org/10.33225/jbse/15.14.142

Flores Ph D, G., & Estudillo Ph D, A. G. (2018). Effects of a peer-to-peer mentoring program: Supporting first-year college students' academic and social integration on campus. *Journal of Human Services: Training, Research, and Practice*, *3*(2), 3.

Galindo-Dominguez, H. (2021). Flipped classroom in the educational system. *Educational Technology & Society*, *24*(3), 44-60. https://www.jstor.org/stable/27032855

Gedik, N., Kiraz, E., & Ozden, M. Y. (2013). Design of a blended learning environment: Considerations and implementation issues. *Australasian Journal of Educational Technology, 29*(1). https://doi.org/10.14742/ajet.6

George, D. & Mallery, P. (2019). *IBM SPSS statistics 25 step by step: A simple guide and reference* (15th ed.). New York, NY: Routledge.

Giles, M., Baker, S. F., & Willis, J. M. (2020). Pre-service teachers' peer mentoring experience and its influence on technology proficiency. *Mentoring & Tutoring: Partnership in Learning, 28*(5), 602-624. https://doi.org/10.1080/13611267.2020.1859329

Goker, S. D. (2006). Impact of peer coaching on self-efficacy and instructional skills in TEFL teacher education. *System, 34*(2), 239-254. https://doi.org/10.1016/j.system.2005.12.002

Gönen, D. (2024). *Öğretmen Adaylarının Pandemi Sonrası Fen Öğretimi Ve Çevrimiçi Öğrenme Yeterlik İnançlarının İncelenmesi*. [Yayınlanmamış doktora tezi]. Kırşehir Ahi Evran Üniversitesi. https://hdl.handle.net/20.500.12513/6954

Gravetter, E. J., & Wallnau, L. B. (2007). *Statistics for the behavioral sciences* (7th ed.). Belmont, CA: Wadsworth.

Gündüz, A. Y., & Akkoyunlu, B. (2019). Student views on the use of flipped learning in higher education: A pilot study. *Education and Information Technologies, 24*(4), 2391-2401. https://doi.org/10.1007/s10639-019-09881-8

Hall, R., & Hall, M. (2010). Scoping the pedagogic relationship between self-efficacy and Web 2.0 technologies. *Learning, media and technology, 35*(3), 255-273. https://doi.org/10.1080/17439884.2010.485204

Hobbs, R., Donnelly, K., Friesem, J., & Moen, M. (2013). Learning to engage: How positive attitudes about the news, media literacy, and video production contribute to adolescent civic engagement. *Educational Media International, 50*(4), 231-246. https://doi.org/10.1080/09523987.2013.862364

Horizon Report (2024). *2024 EDUCAUSE Horizon Report | Teaching and Learning Edition.* EDUCAUSE Publications. https://library.educause.edu/resources/2024/5/2024-educause-horizon-report-teaching-and-learning-edition

Huang, K. T., Ball, C., Cotten, S. R., & O'Neal, L. (2020). Effective experiences: A social cognitive analysis of young students' technology self-efficacy and STEM attitudes. *Social Inclusion, 8*(2), 213-221. https://doi.org/10.17645/si.v8i2.2612

In'am, A., & Sutrisno, E. S. (2021). Strengthening students' self-efficacy and motivation in learning mathematics through the cooperative learning model. *International Journal of Instruction, 14*(1), 395-410. https://doi.org/10.29333/iji.2021.14123a

Kagan, S. (1994). *Cooperative learning.* San Juan Capistrano, CA: Kagan Cooperative Learning
Keengwe, J., Onchwari, G., & Wachira, P. (2008). The use of computer tools to support meaningful learning. *AACE Review (formerly AACE Journal), 16*(1), 77-92. https://eric.ed.gov/?id=EJ805723

Kemer, E., & Lowenthal, P. (2020). Developing faculty to teach with technology: Themes from the literature. *TechTrends*, *64*(2), 248-259.

Kerr, A. W., Hall, H. K., & Kozub, S. A. (2002). *Doing statistics with SPSS.* Sage.

Khurram, A. Q., & Akgün, F. (2022). Lise Öğretmenlerinin Bilgi ve İletişim Teknolojilerine Yönelik Kabulleri ile Teknopedagojik Eğitim Yeterliklerinin İncelenmesi. *Milli Eğitim Dergisi*, *52*(239), 1945-1972. https://doi.org/10.37669/milliegitim.1129969

Kostolanyova, K., Jurickova, R., Simonova, I., Poulova, P. (2015). Flexible Hybrid Learning: Comparative Study. In: Cheung, S., Kwok, Lf., Yang, H., Fong, J., Kwan, R. (eds) *Hybrid Learning: Innovation in Educational Practices.* ICHL 2015. Lecture Notes in Computer Science (), vol. 9167. Springer, Cham. https://doi.org/10.1007/978-3-319-20621-9_6

Krisi, M., & Nagar, R. (2021). The effect of peer mentoring on mentors themselves: a case study of college students. *International Journal of Disability, Development and Education,70* (5), 1-13. https://doi.org/10.1080/1034912X.2021.1910934

Lee, S., Kim, Y. J., & Park, S. (2012, June). Extensibility of a hybrid approach toward mobile embedded learning space with Web 2.0 technologies. In EdMedia+ Innovate Learning (pp. 950–956). *Association for the Advancement of Computing in Education* (AACE). https://www.learntechlib.org/primary/p/40868/.

Lu, H. L. (2010). Research on Peer Coaching in Preservice Teacher Education - A Review of Literature. *Teaching and Teacher Education 26* (4), 748–753. https://doi.org/10.1016/j.tate.2009.10.015

Martin, F., & Betrus, A. K. (2019). *Instructional video. In Digital Media for* Learning (pp. 67-84). Springer, Cham.

Martyn, M. (2003). The hybrid online model: Good practice. *Educause quarterly, 26*(1), 18-23. https://er.educause.edu/articles/2003/1/the-hybrid-online-model-good-practice

Oh, J. E., Chan, Y. K., Kong, A., & Ma, H. (2022). Animation Students' Engagement and Motivation through Peer Teaching: Online Flipped Classroom Approach. *Archives of Design Research, 35*(1), 7-23. https://doi.org/10.3390/su12187273

O'Reilly, T. (2005). What is Web2.0? Design Patterns and business models for the next generation of software. https://www.oreilly.com/pub/a/web2/archive/what-is-web-20.html

Pearce, E., de la Fuente, Y., Hartweg, B., & Weinburgh, M. (2019). Peer-coaching as a component of a professional development model for biology teachers. *School Science and Mathematics*, *119*(3), 117-126.

Pelletier, K., Brown, M., Brooks, D.C., McCormack, M., Reeves, J., Arbino, N., Bozkurt, A., Crawford, S., Czerniewicz, L., Gibson, R., Linder, K., Mason, J., & Mondelli, V. (2021). *2021 EDUCAUSE Horizon Report Teaching and Learning Edition*. Boulder, CO: EDU. https://www.learntechlib.org/p/219489/.

Pierce, B., van de Mortel, T., Allen, J., & Mitchell, C. (2024). The influence of peer teaching on undergraduate health professional students' self-efficacy beliefs: A systematic integrative review. *Nurse Education Today*, *143, 1-12*. https://doi.org/10.1016/j.nedt.2024.106377

Pon-Barry, H., Packard, B. W. L., & St. John, A. (2017). Expanding capacity and promoting inclusion in introductory computer science: a focus on near-peer mentor preparation and code review. *Computer Science Education, 27*(1), 54-77. https://doi.org/10.1080/08993408.2017.1333270

Ramadoni, R. (2023). Inspecting How Different Students' Personalities Affect Students' Performance in Calculus Practicum Courses Utilizing Peer Teaching Flipped Classroom Model. *Acitya: Journal of Teaching and Education*, *5*(2), 449–459. https://doi.org/10.30650/ajte.v5i2.3683

Ramazanoğlu, M. (2020). Opinions of the high school students regarding the flipped classroom practice. H. Gür (Ed.), In *Academic Studies in Educational Sciences* (pp. 1–19). Livre de Lyon. https://bookchapter.org/kitaplar/Academic%20Studies%20in%20Educational%20sciences.pdf .

Ross, S. M., & Morrison, G. R. (2004). *Experimental research methods.* Handbook of research on educational communications and technology, 2, 1021-1043.

Ryan, S., Kaufman, J., Greenhouse, J., She, R., & Shi, J. (2016). The effectiveness of blended online learning courses at the community college level. *Community College Journal of Research and Practice, 40*(4), 285-298. https://doi.org/10.1080/10668926.2015.1044584

Silva, N. F. da, Silva, N. C. M. da, Ribeiro, V. dos S., Iunes, D. H., & Carvalho, E. C. de. (2017). Construção e validação de um vídeo educativo sobre a reflexologia podal. Revista Eletrônica De Enfermagem, 19. https://doi.org/10.5216/ree.v19.44324

Slater, C. L., & Simmons, D. L. (2001). The design and implementation of a peer coaching program. *American Secondary Education, 29*(3), 67-76. https://www.jstor.org/stable/41064432

Sukma, L., Ramadoni, R., & Suryani, M. (2022). The implementation effect of peer teaching flipped classroom on student's understanding of mathematical concepts in learning mathematics. *Alifmatika Jurnal Pendidikan Dan Pembelajaran Matematika, 4*(2), 150-165. https://doi.org/10.35316/alifmatika.2022.v4i2.150-165

Sunarya, L., Purbayani, A. D., & Handayani, N. (2021). Media video promosi pada roofpark cafe & restaurant pucak bogor jawa barat. *TMJ (Technomedia Journal), 5*(2), 220-234. https://doi.org/10.33050/tmj.v5i2.1448

Tschannen-Moran, M., & McMaster, P. (2009). Sources of self-efficacy: Four professional development formats and their relationship to self-efficacy and implementation of a new teaching strategy. *The elementary school journal, 110*(2), 228-245. https://doi.org/10.1086/605771

Urias, M. V., Rosillo, M. R., Duarte, S. R., García, E. J., & Vivas, G. M. (2018). *Evaluation of a pedagogical model for hybrid programs.* In *10th International Conference on Education and New Learning Technologies (EDULEARN 18),* (pp. 560-567). IATED Academy. https://doi.org/10.21125/edulearn.2018.0227

Vaughan, N. (2010). *Student engagement and Web 2.0: What's the connection? Education Canada, 50*(2), 52-55. https://www.edcan.ca/wp-content/uploads/EdCan-2010-v50-n2-Vaughan.pdf

World Medical Association. (2001). World Medical Association Declaration of Helsinki. Ethical principles for medical research involving human subjects. *Bulletin of the World Health Organization, 79*(4), 373-374. https://apps.who.int/iris/handle/10665/268312

Xu, L. J., Yu, S. Q., Chen, S. D., & Ji, S. P. (2021). Effects of the flipped classroom model on student performance and interaction with a peer-coach strategy. *Educational Studies*, *47*(3), 292-311. https://doi.org/10.1080/03055698.2019.1701991

Yang , X., & Wattanapayungkul, Y. (2024). Guideline of integration flipped classroom and peer teaching method and peer teaching method to improve the tennis learning outcome of students at wuhan sports university, People's Republic of China. *International Journal of Sociologies and Anthropologies Science Reviews, 4*(2), 477–484. https://doi.org/10.60027/ijsasr.2024.4046

Yalman, M., & Tunga, M. A. (2012). Üniversite öğrencilerinin bilgisayar deneyimleri ile bilgisayar algılarının bazı değişkenlere göre incelenmesi: Dicle Üniversitesi örneği. *Dicle Üniversitesi Ziya Gökalp Eğitim Fakültesi Dergisi*, *18*, 168-188. https://dergipark.org.tr/en/download/article-file/787015

Yamagata-Lynch, L. C. (2014). Blending online asynchronous and synchronous learning. *International Review of Research in Open and Distributed Learning, 15*(2), 189-212. https://doi.org/10.19173/irrodl.v15i2.1778

Zalloum, I. O. (2021). *EFL teacher's attitudes towards using online learning in palestinian high schools during covid-19 pandemic.* [Master's thesis, Hebron University, College of Graduate Studies]. Palestine. http://dspace.hebron.edu/xmlui/handle/123456789/992

Zhang, S., Carroll, M., Li, C., & Lin, E. (2021). Supporting part-time students in doctoral programs: a technology-based situated learning model. *Studies in Graduate and Postdoctoral Education, 12*(2), 190-205. https://doi.org/10.1108/SGPE-11-2019-0082

Zhang, S., Q. Liu, & Q. Wang. 2017. "A Study of Peer Coaching in Teachers' Online Professional Learning Communities." *Universal Access in the Information Society 16* (2), 337–347. https://doi.org/10.1007/s10209-016-0461-4

Zwart, R. C., Wubbels, T., Bergen, T., & Bolhuis, S. (2009). Which characteristics of a reciprocal peer coaching context affect teacher learning as perceived by teachers and their students?. *Journal of Teacher Education*, *60*(3), 243-257. https://doi.org/10.1177/0022487109336968