Iranian Distance Education Journal

Open Access

winter-Spring (2025) 7 (1): 1-15
DOI: 10.30473/idej.2023.67741.1153

ORIGINAL ARTICLE

Making use of educational technologies in the collaborative learning of Iranian students

Mahdi mahmodi

1. Associate Professor, Department of Educational Sciences, Payam Noor University, Tehran, Iran.

Correspondence:
Mahdi mahmodi
Email:
mahmodi86@pnu.ac.ir

Received: 27/April/2023
Accepted: 23/Auqust/2023

How to cite:
Mahmodi, M; (2024)., Making use of educational technologies in the collaborative learning of Iranian students. **Iranian Distance Education Journal**, 7 (1), 1-15.
DOI: 10.30473/idej.2023.67741.1153

ABSTRACT

The purpose of this research is to determine the effect of using new educational technologies (interactive PowerPoint) on the collaborative learning of sixth grade students. The present research is an applied research in terms of purpose and semi-experimental one in terms of data collection method. The current research is experimental in terms of the type of strategy, and in terms of the execution path, it is quasi-experimental, with a pre-test-post-test design with a control group. The important reason for choosing this design is the possibility of maximum comparison with the presence of the control group. The statistical population of this research (250) includes all the sixth grade students of Qazvin city, in the academic year 2017-2018. Using simple random sampling method, 50 people (25 control group and 25 experimental group) were selected. For data collect purpose, participatory and active learning questionnaire (Cho and Bavli, 2007) has been used. The data collection instrument is a package of using modern educational technologies (interactive PowerPoint). Content validity was checked to secure the validity of the research and Cronbach's alpha coefficient was used to determine the reliability of the instrument. The reliability of the questionnaire was found to be 0.85. The results of the present study indicated that the use of new educational technologies (interactive PowerPoint) had a positive and significant effect on the group dynamics and project of the sixth grade elementary students. The findings of the present research also revealed that making use of use of new educational technologies (interactive PowerPoint) had a significant effect on the collaborative learning of students. It also indicated that the use of new educational technologies (interactive PowerPoint) had a significant effect on the dimensions of collaborative learning (group dynamics, doing work on the project, feedback) and students' feedback.

KEYWORDS

new educational technologies, interactive PowerPoint, collaborative learning, sixth grade students.

Extended Abstract

Introduction

Increased access to educational technologies in classrooms across the world over the last two decades has transformed pedagogical practices (Collins & Halverson, 2010). Most recently, the COVID-19 pandemic has necessitated the use of educational technologies, transforming student learning further, as students began home-based online learning at an unprecedented rate (Wen et al., 2021). As students return to in-person learning, emphasis remains on preparing students to enter our complex technology and media-driven environment where devices and applications change rapidly, information is readily accessible, and there are increasing opportunities for large-scale collaborations. Collaborative learning (CL) has been recognized as necessary competencies to prepare students for the current global knowledge society (Henry, 2015; Partnership for 21st Century Skills, 2011; Voogt & Roblin, 2012).

When technology is introduced within collaborative learning, it processes have been found to be similar to when learning without technology (Garris et al., 2018). Educational technologies' tools can be used to mediate access to shared content and the quick and efficient exchange of ideas (Shamir-Inbal & Blau, 2021). When engaging in collaborative learning in online environments, some students may feel less intimidated to participate in group discussions than in a face-to-face context, affording those students equal access to participation (O'Donnell, 2006). Among students, those who use of social media and interactions with their peers and teachers influence students' engagement in collaborative learning and their learning performance (Qureshi et al., 2021). When students engaged in collaborative learning within online networks, students experience higher academic achievement, greater mastery of subject matter, and increased success during problem-solving tasks, compared to students who engage in computer-mediated learning independently (Resta & Laferriere, 2007). Linear teaching methods are unidirectional; teacher's duty is to transfer a set of predetermined knowledge and information to the student, and the students are usually passive and not participating in the decision-making process of educational programs and activities. In such an educational setting, students do not have any opportunity to practice the interactional skills. Individualism and lack of desire to cooperate with other students is the result of such teaching methods. Therefore, for this purpose, the students should be provided with the required setting so that they can improve their cooperative learning. Making use of new educational technologies (interactive PowerPoint) is one step towards this purpose. Teaching through active methods and making use of up-to-date software enhance students' learning making them not only understand the subjects but also use them in their daily life. Instead of effortlessly memorizing the answers, rote learning, the students should be taught how to think and be creative about their academic and social affairs. Active interactional teaching methods, if carried out properly, would result in students' academic progress and meaningful learning. It would also make students' capabilities flourish. (Shafiei and Sharifzadeh, 2019). Some trainers and teachers believe that most educational topics cannot be thought through traditional teaching methods. Therefore, teachers' making use of different teaching methodologies and supplementary educational tools are inevitable. Through using these tools, students are objectively involved in the process of learning (Rezaei, 2018).

Unfrtunately, the traditional teaching methods and tests often decrease students' motivation to study; they make students' capabilities ignored and reduced to the lowest level. Throughout the past few decades, active interactional teaching methods have been the focus of many researchers. One of the learner-centered teaching methods is cooperative learning or in short cooperative learning. Today, educational science experts consider collaborative learning to be more effective in the learning process and have come to the conclusion that working in groups is the key to solving many learning problems of learners. Collaborative learning gives a practical dimension to social and interactive learning environments (Khosravipour and Izadi, 2017). For a long time, it was a common practice for teachers, in teacher-centered schools, to be the sole speaker while students were supposed to be spectators. However, student-centered

approaches are expected to have a positive effect on students' learning. Collaborative learning is a method in which students have an active role in the class and the teacher is only a facilitator; it is a kind of team work aiming at a meaningful learning (Labonté and Smith, 2022). With the expansion of information technology, learning technology with its various approaches such as network learning and cooperative learning quickly established themselves in educational settings improving the methods. Information and communication technology is a complement to the educational system, not a substitute for it; it has been developed to make educational resources and especially human resources more efficient (Najafi et al., 2014).

The closeness and mutual cooperation of information and communication technologies with new learning approaches and theories is one of the foundations for modifying and revising educational systems in this new global setting and information era. According to Grayson and Anderson (2005), communication technologies, the Internet, and the world web network have changed the learning process and focused on the learner. This type of education, as it has been running currently, is not a top-down process and the teacher is not considered the only source of information. In this model, learning is an interactive process in which the teacher is a facilitator endeavoring to deepen and speed up the learning process through communication tools. One of the important aspects of the emergence of information technologies, beside as a tool for education, and computerized curriculum, is establishing an environment for the interaction between the learner and the teacher and learners with each other; it has made learning /teaching as interactional processes. Unlike traditional education, e-learning is based on students' self-learning, that is, it is student-centered. The teaching method based on information and communication technology helps the teacher and the student to adopt a learner-oriented approach (Nazari, 2022).

Educational science researchers emphasize that the more people are involved in learning, the better they learn and the more the learner's senses are used in acquiring information - the whole person is involved- the more the amount of learning would be. Therefore, modern educational technologies create proper interactive multi-sensory experiences helping to enhance the quality and attractiveness of education. (Khairi and Zahedi, 2016) Using computers and educational software saves learning time. As it provides the learners with feedback, they are highly active and motivated. In addition, using technology to present lectures attracts the students' attention and makes them focused (Mohammadi, 2012). Facilitating learning and increasing learning speed are among the advantages of using educational software resulting in reducing learning time, caring for individual learning differences, drawing learner's attention to the subject and simultaneous using of different senses – visional, auditory. It leads to more stable and deeper understanding of the four skills (nazari, 2022).

Modern educational technologies (interactive PowerPoint) are rarely used in our schools. However, the researcher has observed the use of this technology in a number of sixth grade elementary smart schools in Qazvin. Therefore, the present paper aims at addressing the main research question, namely: what is the effect of using new educational technologies (interactive PowerPoint) on the cooperative learning of sixth grade students in Qazvin?

Many researches can be found that have addressed the issue of cooperative learning and the role of educational technologies in its development. Daniel and Taddes (2020) claimed that scientific reasoning, as an (educational) tool, can be used to stimulate meaningful collaborative learning through encouraging diversity in students' thinking. And on the other hand, collaborative learning presents a useful perspective that can guide teachers who want to use scientific reasoning in their teaching. New educational technologies (interactive PowerPoint) can be of a great help in education and, provided that we acquire its basic principles and components. This new technology can help us a lot in education. One of the benefits of this technology is to speed up the teacher's work; by employing the technology, the teacher can use the time properly teaching the content in an attractive way. to teach. New educational technologies

make students receive and make sense of information in a collaborative and friendly setting with other classmates; it also makes the teacher spend less time providing information to students (nazari, 2022).

Collaborative learning is able to change passive students into active and constructive learners. In collaborative learning, small groups of learners work together as a team to solve a problem, complete an assignment reach a common goal (Grady, 2011).

Kagan (2001) believes that collaborative learning is one of the successful strategies of teaching small groups for students with different abilities. In this method diverse learning activities are used to enhance students' understanding of the content. Each member of the group is responsible not only for his own learning, but also for his teammates'. Shafiei and Sharifzadeh (2019) in their research entitled "Effect of educational software on students' learning" concluded that educational software makes students to have a deeper understanding of the content; they are even able to apply their learning in their daily lives. to learn more and students can better understand the subjects and even apply them in life. They can communicate their learning so fast. Also; Glini (2018) conducted a research entitled "Investigating the effect of using educational software in creating motivation to learn in preschool children". Their findings indicated that using educational software enhanced the learning motivation of learners. Learners who are trained making use of educational software have been significantly better in learning cognitive skills compared to learners who are trained traditionally. Mousavi and Sardari (2018) conducted a research titled "Determining the effectiveness of cooperative learning model on self-directed learning (self-management, willingness to learn and self-control) of female students". The results of this research revealed that the cooperative learning model was effective on students' self-directed learning leading to an increase in self-directed learning scores. The self-directed learning composed of self-control, self-management, and willingness to learn in the experimental group. Esmaili and Mousavi (2017) in a research entitled "Comparison of cooperative teaching method through electronic learning environment with lecture style and their effect on creativity and academic progress" came to the conclusion that the creativity and academic progress of students in the experimental group compared to the control group increased significantly (p Value %95). Based on the results of the research, the cooperative learning teaching method had an effective and positive effect on students' creativity and their academic achievements; Therefore, this finding should be taken into account in any educational policies.

Furthermore, Deyakulu et al(2020) in their research entitled as "The effect of gamification activities (a gamification software) on the academic success of students in the social studies course, attitude towards the course and collaborative learning skills" reported that teaching social studies education through educational game software, had more effect on students' achievement in their social studies course compared with the traditional method. Labonté and Smith (2022) in a research entitled as "collaborative learning in physical education: a study of students" reported that many students had a positive attitude towards CL after a meaningful learning experience through CL (group learning); they started working in small groups. This study revealed that having learning goals is valuable for most students.

Sulfemi and Kamalia (2020) conducted a research entitled as "collaborative learning model (Jigsaw) using audio and visual media to improve learning results". The results of the study indicated that the percentage of students' learning results got increased. It also indicated that using the collaborative and group learning model (Jigsaw) with the help of audiovisual media can improve the results.

Due to the diversity of educational aids and related technologies, in present research, educational technology specifically refers to the presentation of course materials using "interactive PowerPoint" software. In general, the review of existing literature indicates that conducting researches of this type is of special importance and the obtained results can provide teachers, trainers, and education workers with proper teaching methods and approaches. Therefore,

considering the era of new technologies and also referring to the large number of students with learning problems, the purpose of the present research is to determine the effect of using new educational technologies (Interactive PowerPoint) on the cooperative learning of sixth grade students. The following hypotheses have been formulated:

1. The use of new educational technologies (interactive PowerPoint) has an effect on the group dynamics of sixth grade students.
2. The use of new educational technologies (interactive PowerPoint) has an effect on the projects undertaken by the students of sixth grade.
3. The use of new educational technologies (interactive PowerPoint) has an effect on the feedback of sixth grade elementary students.

Methodology

In terms of purpose, this research is among applied designs, and in terms of its execution path or method, it is quasi-experimental design. Among the existing quasi-experimental designs, the pre-test-post-test design with the control group has been used. Table 1 shows the research plan of the groups.

Table 1. Pre-test-post-test design with control group

RE	*T1*	*X*	*T2*
RC	*T1*	-	*T2*

First, we measure the proficiency level of these 50 students before using interactive PowerPoint, and then we teach 25 students (experimental group) through interactive PowerPoint, and the control group receives traditional education (without interactive PowerPoint). Then the scores of the two groups are compared.

The statistical population of this research includes all the sixth grade students of Qazvin city, (250 people) in the academic year 2017-2018. In order to determine the sample size, Cohen's table (statistical power of 0.80) was used. The main data collection method is library research including books, articles, conferences, and also internet resources; field research was employed to collect data through questionnaires. A package of new educational technologies (interactive PowerPoint) has been used for data collection too. Interactive or two-way PowerPoint are media that establish an interactional educational situation between the learner and technology (such as computers and digital resources). These media are designed in such a way that they elicit answers from the learners and often they can even evaluate their answers and give feedback to them. Interactive PowerPoints can be professional or teacher-made containing questions and answers, contests, pictures, etc. (Ahmadi et al., 2019). These types of PowerPoints contain interactive buttons. When a student presses an interactive button on a slide, they are transferred to the pages and contents of other slides according to the designed structure. It should be noted, interactive PowerPoint was used to the experimental group during six training sessions (sixty minutes) and with the presentation of training files, and during six consecutive weeks.

The second instrument used in this research is the collaborative and active learning questionnaire of Chu and Bavli (2007). This questionnaire includes 3 dimensions, namely group dynamics, project and feedback; it includes 13 items. The questionnaire is designed and scored based on a 5-point Likert scale. To determine the validity, content validity was considered. Cronbach's alpha coefficient was employed to measure the reliability of the questionnaire. The obtained reliability was 0.85.

Both descriptive and inferential statistics have been used for data analysis. In the descriptive statistics section, statistical items such as frequency, percentage, mean, and standard deviation have been calculated, and in the inferential statistics section, the KS test has been used to determine whether the variables are parametric or non-parametric. Also, one-variable covariance analysis test has been used. SPSS version 23 has been employed for data analysis.

Findings

In this section, the results obtained from the collected data have been presented in two separate parts, namely descriptive and inferential. In descriptive part, the statistical description (mean and standard deviation) of the questionnaire has been presented through tables.

Table 2. Comparison of the mean and standard deviation of cooperative and active learning and its dimensions in the pre-test, post-test of the control and experimental groups.

		Pre-test		Post-test	
Dimension	Group	Mean	Standard deviation	Mean	Standard deviation
Group Dynamics	Control G.	1.95	.366	4.34	.525
	Experimental G.	3.11	.542	3.35	.651
Project	Control G.	1.99	.749	4.13	.486
	Experimental G.	2.90	1.09	3.31	.708
Feedback	Control G.	1.89	.284	4.29	.464
	Experimental G.	2.79	1.31	2.11	1.13
Collaborative learning	Control G.	1.96	.434	4.25	.428
	Experimental G.	3.07	.639	3.09	.865

As the above table presents, the average "collaborative learning" of the experimental group is (1.96) and the control group (3.07) in the pre-test. However, there is a big difference between the average of "collaborative learning" in the post-test of the two control and experimental groups. That is, the average of "collaborative learning" in the experimental group has increased from 1.95 to 4.25. But this variable did not increase much in the control group; it only changed from 3.07 to 3.09. This shows that the mean of "collaborative learning" of the experimental group increased more than the control group. The findings of the research also revealed that the use of new educational technologies (interactive PowerPoint) had a positive effect on all aspects of collaborative learning.

A) The assumption of normality of the data:

Before using the analysis of covariance, the assumption of normality of the data should be met. If the null hypothesis on the normality of the data is confirmed, then the analysis of covariance test can be used to continue the analysis, otherwise the test should not be used. In the following, this assumption will be investigated.

Table 3. Test of Kurtosis and skewness of the data

	Dimension	Test	No.	Kurtosis (-3 and 3)	Skewness -5 and 5
1	Group dynamics	Pre-test	25	.163	-.797
2		Post-test	25	-.011	-1.571
3	Project	Pre-test	25	-.150	-.579
4		Post-test	25	-.417	-1.266
5	Feedback	Pre-test	25	.942	.557
6		Post-test	25	-.486	-1.217
7	Collaborative learning	Pre-test	25	.114	.931
8		Post-test	25	-.401	-1.313

The Klumgrove-Smirnov test for the pre-test and for the post-test indicated that all dimensions of cooperative learning had a normal distribution. Thus, the covariance analysis test can be used. In fact, the results of the above output revealed that the p values in the aforementioned test was greater than 0.05. The null hypothesis in the Klumgrove-Smironov test is that the data follows the desired distribution (which is the normal distribution here). The opposite hypothesis is that the data does not follow the desired distribution (which here is a normal distribution), considering the P value which does not reject the null hypothesis, the data distribution is considered to a normal distribution.

b) Homogeneity of variance of groups:

Homogeneity of variance in experimental groups can be checked through using Levine's test.

Table 4. Homogeneity of variance test of groups (Collaborative learning)

		Df1	Df2	SIG.
Group dynamics	1.887	1	28	.176
Project	1.534	1	28	.327
Feedback	1.401	1	28	.420
Collaborative learning	2.436	1	28	.095

Usually, if the level of significance in Levin's test, which is shown in Table (4) with sig, is greater than 0.05, then it can be said that the variance of the groups is homogenous. The null hypothesis in this test is that the variance of the two groups is homogenous. According to the sig of the table, which is more than 0.05, the alternative hypothesis is rejected and the null hypothesis is confirmed. In fact, considering that the assumption of homogeneity of variances has been met, the analysis of covariance test can be used.

Table 5. The results of the Mbox test for the cooperative and active learning variable

Factors	Test statistics
Mbox	25.014
F value	3.885
Degree of freedom 1	6
Degree of freedom 2	16693.132
P value	.001

The results of this analysis indicate the rejection null hypothesis and the acceptance of the alternative hypothesis (the heterogeneity of the variance-covariance matrix of the groups). As the implementation of the diagnostic analysis method is based on the inequality of the groups' covariance matrix, this assumption has been met too.

Hypothesis (main): The use of new educational technologies (interactive PowerPoint) has an effect on the collaborative learning of sixth grade students.

Table 6. Comparing the mean of collaborative learning variables of sixth grade elementary students

	statistical index of variables	Group	Mean	Standard deviation	t	p
Collaborative learning	Pre-test	Experimental G.	1.96	.434	-7.245	0.000
		Control G.	3.07	.639		
	Post-test	Experimental G.	4.25	.428	5.981	0.000
		Control G.	3.09	.865		

As the above table indicates, the average "collaborative learning" of the experimental group is (1.96) and the control group (3.07) in the pre-test. However, there is a big difference in the average of "collaborative learning" between the post-test of the two control and experimental groups. That is, the average of "collaborative learning" in the experimental group has increased from 1.96 to 4.25. But, it is not increased too much in the control group; it changed from 3.07 to 3.09. This shows that the mean of "collaborative learning" of the experimental group increased more than the control group. Covariance analysis is used to investigate the effect of using new educational technologies (interactive PowerPoint) on collaborative learning by controlling the pre-test effect.

Table 7. The analysis of covariance test for the effect of using new educational technologies (interactive PowerPoint) on the collaborative learning of students among groups

	Collaborative learning	Test	sum of squares	DF	Mean of squares	F value	Sig.	Effect size	Test power
1	Pre-test	Post-test	16.430	2	8.215	17.127	0.000	0.422	1.000

As table (7) shows that the average effect of using new educational technologies (interactive PowerPoint) on the collaborative learning of students has increased significantly in the post-test phase. However, in order to eliminate the effects of the pre-test, the analysis of covariance test was used. The results indicated that there is a significant difference between the collaborative learning of the students in the post-test stage. Therefore, the hypothesis that new educational technologies (interactive PowerPoint) has an effect on the collaborative learning of students is confirmed. The amount of this effect in the post-test stage is 0.42.

Hypothesis (1): The use of new educational technologies (interactive PowerPoint) has an effect on the group dynamics of sixth grade elementary students.

Table 8. Comparing the means of group dynamics of sixth grade elementary students

	statistical index of variables	Group	Mean	Standard deviation	t	p
Group dynamics	Pre-test	Experimental G.	1.95	.366	-7.867	0.000
		Control G.	3.11	.542		
	Post-test	Experimental G.	4.34	.525	5.881	0.000
		Control G.	3.35	.6551		

As the table presents, the average "group dynamics" of the experimental group (1.95) and the control group (3.11) in the pre-test are very different. However, there is a big difference between the average "group dynamics" in the post-test of the two control and experimental groups. That is, the average "group dynamics" in the experimental group increased from 1.95 to 4.34. But, it is not increased too much in the control group; it only changed from 3.11 to 3.35. This indicates that the average "group dynamics" of the experimental group increased more than the control group.

Table No. (9) Analysis of covariance test for the effect of teaching the use of modern educational technologies (interactive PowerPoint) in the group dynamics of students among groups

	Group dynamics	Test	sum of squares	DF	Mean of squares	F value	Sig.	Effect size	Test power
1	Pre-test	Post-test	12.542	2	6.271	10.0148	0.000	0.434	1.000

Table (9) indicates that the average effect of using modern educational technologies (interactive PowerPoint) on the group dynamics of students has increased significantly in the post-test phase. However, in order to eliminate the effects of the pre-test, the analysis of covariance test was used. The results indicated that there was a significant difference between the group dynamics of the students in the post-test stage. Therefore, the hypothesis that teaching the use of new educational technologies (interactive PowerPoint) has an effect on the group dynamics of students is confirmed. The amount of this effect in the post-test stage is 0.43.

Hypothesis (2): Using new educational technologies (interactive PowerPoint) has an effect on the project of sixth grade students.

Table number (10) Comparing the means of doing project of sixth grade elementary *students*

	statistical index of variables	Group	Mean	Standard deviation	t	p
Project	Pre-test	Experimental G.	1.99	.749	-5.897	0.000
		Control G.	2.90	1.09		
	Post-test	Experimental G.	4.13	.486	5.133	0.000
		Control G.	3.31	.708		

Table 10 presents the mean of "doing project" of the experimental group (1.99) and the control group (2.90) in the pre-test. But, there is a big difference between the mean of "doing project" in the post-test of the two control and experimental groups. That is, the mean of "working on the project" in the experimental group has increased from 1.99 to 4.13. But, it is not increased too much in the control group; it only changed from 2.90 to 3.31. This reveals that the mean of "doing project" in the experimental group increased more than the control group.

Covariance analysis is used to investigate the effect of using new educational technologies (interactive PowerPoint) on doing project by controlling the pre-test effect.

Table 11. The analysis of covariance test for the effect of using modern educational technologies (interactive PowerPoint) on students' projects among groups

	projects	Test	sum of squares	DF	Mean of squares	F value	Sig.	Effect size	Test power
1	Pre-test	Post-test	16.036	2	8.018	10.050	0.000	0.270	.980

Table (11) presents that the mean effect of using new educational technologies (interactive PowerPoint) on students' projects has increased significantly in the post-test phase. However, in order to eliminate the effects of the pre-test, the analysis of covariance test was used. The results indicated that there was a significant difference between the students' project in the post-test stage. Therefore, the hypothesis that using new educational technologies (interactive PowerPoint) has an effect on students' projects is confirmed. The size of this effect in the post-test stage is 0.270.

Hypothesis (3): The use of new educational technologies (interactive PowerPoint) on the feedback of sixth grade elementary students.

Table No. (12) Comparing the mean of feedback variable of sixth grade elementary students

	statistical index of variables	Group	Mean	Standard deviation	t	p
Feedback	Pre-test	Experimental G.	1.89	.284	-3.336	0.000
		Control G.	2.79	1.31		
	Post-test	Experimental G.	4.29	.464	5.338	0.000
		Control G.	2.99	1.13		

Table 12 shows that the mean of "feedback" of the experimental group is (1.89) and the control group (2.79) in the pre-test. But, there is a big difference between the mean of "feedback" in the post-test of the two control and experimental groups. That is, the mean of "feedback" in the experimental group increased from 1.89 to 4.29. But, it is not increased too much in the control group; it only changed from 2.79 to 2.99. This indicates that the mean of "feedback" of the experimental group increased more than the control group.

Covariance analysis is used to investigate the effect of using new educational technologies (interactive PowerPoint) on feedback by controlling the pre-test effect.

Table 13. The analysis of covariance test for the effect using modern educational technologies (interactive PowerPoint) on students' feedback among groups

	Feedback	Test	sum of squares	DF	Mean of squares	F value	Sig.	Effect size	Test power
1	Pre-test	Post-test	26.642	2	13.321	20.423	0.000	0.442	1.000

As table (13) indicates, the mean effect of using modern educational technologies (interactive PowerPoint) on students' feedback in the post-test stage has increased significantly. But

in order to remove the effects of the pre-test, from the test, analysis of covariance was used. The results indicated that there is a significant difference between the students' feedback in the post-test stage. Therefore, the hypothesis that using new educational technologies (interactive PowerPoint) has an effect on students' feedback is confirmed. The size of this effect in the post-test stage is 0.465.

Discussion and Conclusion

This research has been conducted with the aim of determining the effect of using new educational technologies (interactive PowerPoint) on collaborative learning of sixth grade elementary students. The findings of the present study indicated that using new educational technologies (interactive PowerPoint) had a positive and significant effect on collaborative learning of sixth grade students. In this context, Mousavi and Sardari (2018) pointed out that the collaborative learning model was effective on the self-directed learning of students. It resulted in an increase in self-directed learning scores and its components, namely self-control, self-management, and willingness to learn in the experimental group. In line with this research, Ismaili and Mousavi (2017) found that the creativity and academic progress of students in the experimental group compared to the control group was significantly increased (with a 95% confidence factor). Based on the results of the present research, it is indicated that the collaborative learning teaching method - through the electronic learning - has a positive on students' creativity and their academic achievement. Therefore, this should be taken into account in educational setting. Fatemi (2017) also reported that teaching through computers, as a new educational technology used by teachers, made the students get interested in learning and doing their assignments. Also, by using educational aids, teachers can clearly define the content and objectives of teaching to their students. The results also indicated that this teaching methodology had the same effect across genders.

New educational technologies (interactive PowerPoint) make students participate in class activities; they can communicate and interact through PowerPoint. In fact, it establishes a two-way educational interaction between students and technology. it makes them actively participate more in classroom activities. In this context, Soleimani et al. (2015) reported that the use of communication technology, as one of the new methods and tools of teaching, had a significant effect on the effective components of students' learning. The results are also in line with the findings of Shafii and Sharifzadeh (2019) who concluded in their research that educational software made the students learn more; students can better understand the subjects and they can even apply them in their daily lives. Furthermore, Saeedi and Mansouri (2017) reported that using software was effective in promoting learning basic vocabulary by non-Persian speakers. Abdulahi et al. (2016) concluded that educational technology had a positive effect on the motivation and academic achievements of students. It developed a student-centered approach and a more collaborative learning method. It established more interaction between the teacher and the student. Making use of technology in teaching academic skills enhanced team-working. Also, Deyakulu et al(2020) reported that using educational game software enhanced teaching social studies; it promoted students' cooperation skills more than the traditional method. Also, social studies education, supported by educational games, promoted social science students' academic achievement more than the traditional methods. Labonté and Smith (2022) in their research reported students after experiencing group learning method developed a positive attitude towards CL; they were able to work with other people in small groups. This study indicated that that setting learning goals was of importance for most of the students.

The findings of the present research indicated that the use of new educational technologies (interactive PowerPoint) has a positive and significant effect on the group dynamics of sixth grade elementary students. So, the research is consistent with the previous findings. In line with this trend, Hadadan's research reported that when the teacher made use of educational tools, students got a deeper and faster understanding of the content; students found content more attractive. Even passive students became very active. Using interactional PowerPoint made the students participate actively in the classroom

involving themselves in the issues raised there. It made them talk freely about the course material and listen carefully to the topics raised in the classroom. They also participated in group discussions. Najafi et al. (2014) through their research that there was a positive and significant relationship between the use of new educational technologies and students' academic achievements. In line with this, Sulfemi and Kamalia (2020) indicated that using cooperative learning model and audio-visual media increased students' achievements. The results of this study revealed that using the group learning model supported by audiovisual media could improve learning results. In line with this research, Weiner and Ingersoll (2010) indicated that the making use of computer technologies such as multimedia interactive computer programs and virtual reality can be effective in improving and developing the social and communication skills of students with autism. Brid (2016) pointed out that the structure of group work activities was significantly effective on some aspects of self-directed learning such as assessment, monitoring of learning, interpersonal skills and preparation for self-directed learning.

Furthermore, the findings of the current research revealed that the use of new educational technologies (interactive PowerPoint) had a positive effect on the project of sixth grade students. The findings of the present study are consistent with the previous ones. Labonté and Smith (2022) used collaborative computer learning strategies to help students to self-regulate themselves and improve their problem solving skills in mathematics. Finally, they came to the conclusion that problem solving skill training through collaborative learning increased decision-making power, self-management and self-responsibility of the students; it enhanced their academic achievement as well. Interactive PowerPoint provides the required setting for the earners to work on different projects; it made them learn the content and course materials interactively through using modern educational media. In line with these findings, Safari et al. (2016) also in a research on effect of educational technology and its cognitive and metacognitive learning strategies on the academic achievement of students indicated that both educational methods were able to promote the academic achievement and self-efficacy of students. Furthermore, it was reported that students were able to conduct research in a more practical way. Traditional research classes were changed. After acquiring the theoretical issues on research methodology, the students got involved in more applied researches.

Also, the research results of Pishgooie et al. (2010) show in this regard that comparing the lecture teaching method with the e-learning teaching method, it indicates that the performance of the electronically trained group is more than average, and better than the performance The group has been a witness. In their research, they also reached the conclusion that there is a significant correlation between the academic progress of students and the cooperative teaching method through electronic education. Osman et al. (2018) showed in their study that the use of multimedia instead of the office to practice math problems led to a more positive attitude towards learning mathematics in students who had used multimedia. Also, the researchers observed that this student became more independent, more interested, and more diligent, and was able to learn mathematical concepts easily and showed more enthusiasm to continue working. Also, the research results of Pishgooie et al. (2019) on the comparison between lecture-based classes and e-learning ones indicated that the performance of the electronically trained students were better than the performance the control group. They came to the conclusion that there was a significant correlation between the academic progress of students and collaborative method through eLearning. Osman et al. (2018) revealed that the using multimedia instead of pen and paper to practice math problems developed a more positive attitude towards learning mathematics in students who had used multimedia. They became more independent, more interested, and more diligent. It made the students to learn mathematical concepts easily; it also increased their enthusiasm to keep on their studies

Another findings of the current research is that the use of new educational technologies (interactive PowerPoint) has a positive and significant effect on the feedback of sixth grade students. Thus, the findings are consistent with

the reports of the previous findings. Glini (2018) indicated that using educational software increased the learning motivation of learners. Learners who were trained with the help of educational software outperformed significantly, in learning cognitive skills, the learners who were trained in a traditional way. Saidi and Mansouri (2017) also reported that using software proved to be effective in learning basic vocabulary by non-Persian speakers.

Interactive PowerPoint provides the teachers with immediate feedback; it prevents subjective assessment of the teachers and increases students' motivation. In fact, instructors who use interactive PowerPoint in class can make more students involved in class activities and students can get more feedback. In fact, these media have been designed in such a way that they require answers from the learners and often they can even evaluate their answers and give feedback to the learners. Therefore, necessary support and arrangements should be made for the use of new educational technologies, including the provision of related costs in schools. Through holding training workshops and in-service courses for teachers, the problems in the use of educational technology will be reduced. The educational authorities should encourage teachers to make use of new educational technology such as interactive PowerPoint in the teaching / learning processes. The results of the present study are in line with the findings of the other studies. (Sokhni Noushabadi and Jalai ,2016 ; Vahid Mahdiania and Khodayarlou ,2015; Shekari et al.,2016; Zinali, 2014).

Educational science researchers emphasize that the more people are involved in learning, the better they learn and the more the learner's senses are used in acquiring information, that is, the whole person is involved, the more learning would be achieved. Therefore, modern educational technologies provide the learners with proper and interactive multi-sensory experiences helping them to improve the quality and attractiveness of education (Khairi and Zahedi, 2016). Using computers for educational purposes saves the learning time. As computer presentations provide the learners with feedback, it makes the learners very active and increases their learning motivation. Moreover, the use of technology in classroom presentations attracts students' attention and prevents distraction. Daniel and Tadesse (2020) claimed that scientific reasoning, as an educational tool, can be used to stimulate meaningful collaborative learning by acknowledging diversity in students' thinking. On the other hand, collaborative learning is a useful perspective that can guide teachers who tend to use scientific reasoning in their teaching.

New educational technologies (interactive PowerPoint) can be of a great help to education provided that we master its basic principles. This new technology can help us a lot in education; speeding up the teacher's work is one of the benefits of this technology. Through using technology, the teacher can manage the time properly making his teaching attractive. He can give timely feedbacks to students. New educational technologies make it possible for students to have friendly interaction with each in a friendly setting trying to get and make sense of the information provided. It also makes the teacher spend less time for providing information to students.

Suggestions:

- Making use of educational technology in different sections should be supported through holding workshops and in-service courses for teachers. Any problem in using the internet should be cleared. Some teachers still do not agree with the use of these new l technologies in education. This can be attributed to either their lack of knowledge about the process of implementing the method or their lack of knowledge on the positive effect of using technology in education.
- It is suggested that managers, authorities and teachers should be encouraged to familiarize themselves with new innovations in their field. The needed requirements should be provided for teachers so that they can make use of the new technology in their classrooms. Teaching should be done in a way that makes the teachers use the information technology. They should be encouraged to use new solutions and methods through using new educational technologies such as interactive PowerPoint.
- Professional people should be assigned to audio-visual departments in schools.

References

Abdulahi, Daoud, Torabi, Abolqasem, Ayeni, Fatemeh, Najafi, Flor (2016). Studying the impact of information and communication technology on the academic progress of students, the third national conference of modern studies and research in the field of educational sciences and psychology in Iran.

Collins, A., & Halverson, R. (2010). The second education revolution: Rethinking education in the age of technology. Journal of Computer Assisted Learning, 26, 18–27. https://doi.org/10.1111/j.1365-2729.2009.00339.x

Esmaili, Ebrahim and Mousavi, Frank (2017). Comparison of cooperative teaching method through electronic learning environment with lecture method and their effect on creativity and academic progress (Comparison of cooperative teaching method through electronic learning environment with lecture method and their effect on creativity and academic progress), research quarterly, 4(12).

Daniel, A & Tadesse, L. (2020). ScientIfic Argumentation and cooperative Llearning: why Should they be Combined? *Asian Journal of Advances in Research*. 5(4): 1-7

Deyakulu, D.; Buyukozturk, S. & Oscine, H. (2010). Predictors of Academic Achievement of Student ICT Teachers with Different Learning Styles. *International Journal of Humanand Social Science*. Vol. 5: 567-573.

Fatemi, Seyyed Mohammad (2017). Investigating the effect of computer as a new educational technology in creating diverse learning environments for students with intellectual disabilities, publishing system of Farhangian University scientific journals.

Garris, W., Lester, L., Doran, E., Lowery, A., & Weber, A. (2018). iCollaborate or not: Does technology impede collaborative learning among primary grade students? International Journal of Learning, Teaching and Educational Research, 17(5), 64–81. https://doi.org/10.26803/ijlter.17.5.5

Glini, Mehbobeh (2018). Investigating the effect of using educational software in creating learning motivation in preschool children, Journal of Preschool Education Development, 10(3):39-41.

Grady, S. E. (2011). Team-based learning in pharmacotherapeutics. *American Journal of Pharmaceutical Education*, 75(7), 136.

Hadadan, Adel (2015). Educational aids and their impact on learning, the third international conference on new researches in economic management and accounting, Istanbul, Turkey.

Henry, M. (2015). Learning in the digital age: Developing critical, creative and collaborative skills. In S. Younie, M. Leask, & K. Burden (Eds.), Teaching and learning with ICT in the primary school (2nd ed., pp. 1–12). Routledge.

Khairi, Mehtab and Zahedi, Ali (2016). The effect of using educational technology on teaching-learning, international research conference in psychology of educational sciences and social sciences, Shiraz University.

Khosravipour, Bahman and Izadi, Hamed (2017). The role of cooperative teaching method in the teaching and learning of agricultural students, the first national conference on sustainable development in educational sciences and psychology of Iran, Tehran, International Center for Conferences and Seminars on Sustainable Development of Islamic World Sciences.

Labonté, C., Smith, V.R. (2022) Learning through technology in middle school classrooms: Students' perceptions of their self-directed and collaborative learning with and without technology. *Educ Inf Technol* **27**, 6317–6332 (2022). https://doi.org/10.1007/s10639-021-10885-6

Mohammadi, Arezo (2012). Comparison of the effect of collaborative learning and conceptual mapping on students' motivation and academic progress, Master's thesis, Faculty of Economics and Social Sciences, Bo Ali Sina University.

Mousavi, Shadi and Sardari, Baqer (2018). Determining the effectiveness of cooperative learning model on self-directed self-learning, desire for learning and self-control (Determining the effectiveness of cooperative learning model on self-directed

self-learning, desire for learning and self-control), Scientific Journal of Education and Evaluation, 12 46): 65-84.

Najafi, Mahmoud, Maggi, Hamid Reza, Hosseini, Javad and Jafari, Nosrat (2014). The level of use of new educational technologies and its relationship with students' academic progress, Education and Learning Technology Quarterly, 2(5): 82-106.

Nazari, K. (2022). A Comparative Study of Information and Communication Technology in Teacher Education System of Iran and Malaysia. *Comparative Studies of Teacher Education*, *1*(1).

O'Donnell, A. (2006). Introduction: Learning with technology. In A. O'Donnell, C. Hmelo-Silver, & G. Erkens (Eds.), Collaborative learning, reasoning, and technology (pp. 1–13). Lawrence Erlbaum Associates.

Osman, S., Che Yang, C. N. A., Abu, M. S., Ismail, N., Jambari, H., & Kumar, J. A. (2018). Enhancing Students' Mathematical Problem-Solving Skills through Bar Model Visualisation Technique. International Electronic Journal of Mathematics Education, 13(3), 273-279. https://doi.org/10.12973/iejme/3919

Pishgooie A H, Aliyari S, Baniyaghoobi F, Sharififar S, Dadgari A. The Comparison of Lecture-Based and Web-Based Education on Nursing Students' Learning in the Management of Radiation Injuries. Health in Emergencies and Disasters Quarterly 2019; 4 (2):71-78. URL: http://hdq.uswr.ac.ir/article-1-238-en.html

Qureshi, M., Khaskheli, A., Qureshi, J., Raza, S., & Yousuf, S. (2021). Factors afecting students' learning performance through collaborative learning and engagement. Interactive Learning Environments, 1–21. https://doi.org/10.1080/10494820.2021.1884886

Resta, P., & Laferriere, T. (2007). Technology in support of collaborative learning. Educational Psychology Review, 19, 65–83. https://doi.org/10.1007/s10648-007-9042-7

Rezaei, Parvaneh (2018). The effect of technology in the teaching and learning process, Quarterly Journal of Studies and Research in Behavioral Sciences, 1(1): 1-9.

Saeedi, Zari and Mansouri, Talia (2017). Effectiveness of technology and educational software in learning foreign words, Journal of Language, 5 (8): 189-217.

Safari, Noush Afrin, Ghasemipour, Maryam and Taheri, Zahra (2016). The effect of educational technology and cognitive and meta-cognitive learning strategies on the academic progress and self-efficacy of agricultural students of Payam Noor University of Lorestan. Lorestan), Agricultural Education Management Research, 41: 15-3.

Shamir-Inbal, T., & Blau, I. (2021). Characteristics of pedagogical change in integrating digital collaborative learning and their sustainability in a school culture: E-CSAMR framework. Journal of Computer Assisted Learning, 37, 825–838. https://doi.org/10.1111/jcal.12526

Shekari, Abbas; Mohammadi Khashoui, Zahra and Mohammadi, Bahadur (2016). The effect of using new educational technologies on the quality of teachers' educational activities, Journal of Research in Curriculum Planning, 13(25) 74-83.

Sokhni Noushabadi, Muslim and Jalai, Maryam (2016). Investigating the impact of the Aria Book electronic wallet software on the academic progress of the Arabic course, Lasan Mobeen Quarterly, 9(29):23-47.

Soleimani, Bahareh, Faezeh, Karimi, Atakhi, Narges and Derakhsandeh, Pegah (2015). Information and communication technology and its role in students' learning, the third national conference on strategies for the development and promotion of educational sciences, psychology, counseling and education in Iran, Tehran, Association for the Development and Promotion of Basic Sciences and Techniques.

Sulfemi, B & Kamalia,Y(2020). Cooperative learning model using of audiovisual media to improve student learning outcomes. Jurnal Pendidikan Sekolah Dasar (JPsd).

Vahid Mahdiania, Nazila and Khodayarlo, Reza (2015). The effect of using educational software on learning and memorizing chemistry in the second year of high school. 9th Iran Chemistry Education Conference,

Zanjan University: 657-667.

Voogt, J., & Roblin, N. P. (2012). A comparative analysis of international frameworks for 21st century competences: Implications for national curriculum policies. Journal of Curriculum Studies, 44(3), 299–321. https://doi.org/10.1080/00220272.2012.668938

Wen, Y., Gwendoline, C., & Lau, S. (2021). ICT-supported home-based learning in K-12: A systematic review of research and implementation. TechTrends, 65, 371–378. https://doi.org/10.1007/ s11528-020-00570-9

Zainali, Fatemeh (2014). Investigating the relationship between educational aids and students' learning in guidance courses in schools of West Azerbaijan province, the second international research conference in science and technology, Istanbul, Turkey.