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Classroom Teachers' Perception Levels On Flipped Learning

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ABSTRACT

The process of education and training is one of the most affected and compelled fields to change by technology which changes and progresses every day. It cannot be expected for a uniform education that is stuck in certain patterns to meet the needs of the current age. In the recent years, the process of education has acquired a new format under the name flipped education with the influence of global factors and technological advancements. Flipped education has affected all its partakers and cause them to make changes. The aim of this study is to analyze the perception of classroom teachers, who are one of the most important partakers of education, of flipped learning in terms of various variables. With this purpose, a study group consisting of 306 classroom teachers who worked in primary schools affiliated with the Ministry of Education in the 2021-2022 academic year were selected through the maximum variation sampling method. The data of the study were collected through the Flipped Learning Perception Scale developed by Erensayın (2019) which consists of four sub-dimensions as, teacher self-efficacy, technological competence, pedagogical competence, and technological-pedagogical competence. According to the results of the study, it was determined that there is a significant difference in favor of mostly male teachers in terms of gender; there is a significant difference in favor of teachers who have received flipped learning training in terms of training on flipped learning and that there is a significant difference between the teachers with the most seniority and teachers with medium level seniority in terms of professional seniority. No difference was found in terms of the grade level the teachers taught.

Key words: Flipped learning, Classroom teacher, Technological-pedagogical competence

INTRODUCTION

Today, technological devices are being used in all areas of daily life with the changes and developments in technology and science. These changes and developments have made the integration of technology to education inevitable (Demirer and Sak, 2016; Gençer et al., 2014). While technological devices which are the greatest supporters of education provide a higher quality education and training environments for teachers, they play an active role for students in terms of permanent learning and transfer of information. Therefore, technology and education should be intertwined in today's classrooms. Otherwise, it is considered that individuals who are not able to adapt to the developments and changes will not be able to meet the expectations of society (Bolat, 2016).

The interest, needs, and learning status of children are different from each other. This difference, which has emerged with the advancement of technology and its integration to education, has given rise to the formation of different learning approaches in education. With the help of technological devices which form the basis of these new and learning focused approaches, it has been observed that the learning environment can exist outside of classrooms as well. The learning approach called flipped learning supports the idea that learning can take place outside of classrooms as well (Bolat, 2016; Filiz and Kurt, 2015; Torun and Dargut, 2015).

Flipped learning is a model which works in the opposite manner to the conventional education model and allows students to watch the pre-prepared lesson related videos prior to the lessons mostly at home; it also gives a chance for students to learn the subjects in the videos in class through activities, projects and homework and apply these (Doğan, 2015; Toytok et al., 2021). To express in a simpler manner, it can be defined as applying the homework students do at home through conventional methods in the classroom and learning the curriculum at home (Bergmann and Sams, 2012). In flipped learning, the roles of the learner and teacher are partially changed. This model, which focuses on the student, is a model where activities in and outside the classroom are rearranged, students' responsibility and motivation towards the lessons increase and actively participate in the lessons which involve problem-based learning and applications (Kırmızıoğlu and Adıgüzel, 2019). In addition, while this method allows students to take responsibility individually, it also contributes to the development of their upper-level cognitive skills (Gençer et al., 2014).

Flipped learning model can be applied by primary school students under the guidance of teachers and support of

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families at home (Toytok et al., 2021). For flipped learning model to be more successful and applicable, students and teachers have certain duties and responsibilities. At this point, students have duties and responsibilities such as participating in various activities under the guidance and support of their teachers, designing and presenting products related to the lessons, consolidating their learning with group work and make use of their knowledge in the classroom (Şengün, 2021). Outside the classroom, students need to watch lesson videos and lesson content prepared by their teachers and realize their own learning (Toytok et al., 2021). In this respect, it can be expressed that flipped learning model can be applied to numerous lessons in the primary school period. This model presents advantages in many areas in favor of students in this level such as learning by doing and living, actively participating in the lessons, realizing that the teacher may not only be in the classroom, rewatching a missed or unclear lessons and developing motivation towards the lessons (Bolat, 2016; Filiz and Kurt, 2015). However, flipped learning can have certain limitations in terms of students despite these advantages. Insufficient technological opportunities, slipping of the attention to other areas outside the lessons such as playing games are two of these limitations (Milman, 2012).

In flipped learning, the activity of learning forms the focal point of the classroom. Teachers guide students to help them comprehend this process of learning activity in a meaningful manner. As for the duties and responsibilities of teachers in this process, some of these can be listed as preparing lessons students can watch at home and preparing video lessons, sound recordings, animations, etc. which are in line with the learning gains, having competency in using technological devices, guiding the process, creating a learning culture by putting students at the center and making it possible for them to participate in educational activities, enriching the activities they give and providing feedback when necessary (Gençer et al., 2014; Çakır and Yaman, 2017). While flipped learning model provides teachers the chance to develop themselves professionally, it gives advantages such as acquiring different points of view by watching the videos prepared by their colleagues and using time efficiently to prevent time loss in the classroom through technological devices (Toytok et al., 2021; Aydın, 2016). However, it has some disadvantages for teachers as well; such as, insufficient technology, being insufficient in preparing videos for the lessons and not wanting to leave conventional education aside (Toytok et al., 2021; Erbil and Kocabaş, 2019).

In this study, flipped learning model, which emerges as a new approach in education with the developments in technology and is considered as suitable for today's primary school grades, was analyzed through the point of view of classroom teachers. It is important to know to what extent this model serves students, teachers and the education and training process, whether it is essentially applicable by classroom teachers and have information on the level of teachers' perception of flipped learning model. Therefore, it is considered that this study will contribute to the literature and classroom teachers by analyzing the perception level of teachers' perception of flipped learning.

METHOD

Study Model

In this study, which aimed at presenting the perceptions of classroom teachers of flipped learning, the survey model as one of the quantitative research methods was used. The primary aim of survey studies is to present the thoughts, attitude, interest, and skill levels of the participants in terms of an event, a situation. In such studies, the study groups are kept as large as possible (Büyüköztürk et al., 2010)

Study Group

The study group of the study consists of classroom teachers who worked in primary schools affiliated with the Ministry of Education in the 2021-2022 academic year. The study group consists of 306 classroom teachers who worked in the cities of Kahramanmaraş, Gaziantep, Bitlis, Hatay, Şanlıurfa and Adana, selected through the maximum variation sampling method as one of the random sampling methods.

Data Collection Tool and Analysis of Data

The data of the study were collected through the Flipped Learning Perception Scale developed by Erensayın (2019). The scale consists of four sub-dimensions as, teacher self-efficacy, technological competence, pedagogical competence, and technological-pedagogical competence. In the study, it was determined that the Cronbach Alpha values in the sub-dimensions of the scale were as follows: .87 for teacher self-efficacy, .89 for technological competence, .91 for pedagogical competence, .70 for technological-pedagogical competence and .94 for the whole scale. In the light of these results, the data obtained from the study were accepted as reliable.

According to the Kolmogorov Smirnov test or coefficient of skewness results of the study data, it was determined that data related to gender, receiving education on flipped learning, and using informatics technology devices did not display normal distribution, whereas data related to grade level taught by the teachers, professional seniority, and competency in using computers displayed normal distribution. Therefore, Mann-Whitney U test was used to determine whether there is a significant difference between the perceptions of teachers of flipped learning self-efficacy in terms of gender and having flipped learning education and One Way Anova was used to determine whether there is a significant difference between the grade level taught by the teachers, professional seniority, and competency in using computers. Kruskal-Wallis test was used to analyze whether there is a significant difference between the data related to using informatics technology devices in the classroom.

FINDINGS

In this section, the findings of the study on whether there is a difference in the perception of teachers of flipped learning self-efficacy in terms of gender, grade level taught, professional seniority, education on flipped learning, competency in using computers and using informatics technology devices in the lessons are presented.

Results of the Mann-Whitney *U* test related to the perception of teachers of flipped learning self-efficacy in terms of the gender variable are given in Table 1.

The results of the Mann-Whitney *U* test related to the perception of teachers of flipped learning self-efficacy in terms of the gender variable are given in the table with sub-factors and total scores.

According to the table, a significant difference was not found between teacher self-efficacy (U=10460.5, p>.05) and pedagogical competence (U=11050.5, p>.05) sub-factors. However, a significant difference was found in the technological competence sub-factor in favor of male teachers (U=7587, p<.05), in the technological-pedagogical competence sub-factor in favor of male teachers (U=10057.5, p<.05) and in total scores of perception of teachers of flipped learning self-efficacy in favor of male teachers (U=9460.5, p<.05).

Results of the Mann-Whitney *U* test related to the perception of teachers of flipped learning self-efficacy in terms of the education on flipped learning variable are given in Table 2.

The results of the Mann-Whitney *U* test related to the perception of teachers of flipped learning self-efficacy in terms of the education on flipped learning variable are given in the table with sub-factors and total scores.

According to the table, a significant difference was not found in the pedagogical competence sub-factor (U=1283, p>.05). However, a significant difference was found in the teacher self-efficacy sub-factor in favor of teachers who received education on flipped learning (U=1038.5, p<.05), in the technological competence sub-factor in favor of teachers who received education on flipped learning (U=1035.5, p<.05), in the technological-pedagogical competence sub-factor in favor teachers who received education on flipped learning (U=651, p<.05) and in total scores of perception of teachers of flipped learning self-efficacy in favor of teachers who received education on flipped learning (U=962.5, p<.05).

Results of the One-Way ANOVA test related to the perception of teachers of flipped learning self-efficacy in terms of the grade level taught variable are given in Table 3.

It can be seen in the table that, there is no significant difference in the teacher self-efficacy, technological competence, pedagogical competence and technological-pedagogical

Table 1. Results of the Mann-Whitney *U* test related to the perception of teachers of flipped learning self-efficacy in terms of the gender variable

	Gender	N	Mean rank	Rank sum	*U*	*p*
Teacher self-efficacy	Male	145	161.86	23469.50	10460.5	0.116
	Female	161	145.97	23501.50		
Technological competence	Male	145	181.68	26343.00	7587	0.000
	Female	161	128.12	20628.00		
Pedagogical competence	Male	145	157.79	22879.50	11050.5	0.419
	Female	161	149.64	24091.50		
Technological-Pedagogical competence	Male	145	164.64	23872.50	10057.5	0.035
	Female	161	143.47	23098.50		
Total scores	Male	145	168.76	24469.50	9460.5	0.004
	Female	161	139.76	22501.50		

p<.05

Table 2. Results of the Mann-Whitney *U* test related to the perception of teachers of flipped learning self-efficacy in terms of the education on flipped learning variable

	Education on flipped learning	N	Mean rank	Rank sum	*U*	*p*
Teacher self-efficacy	Yes	11	206.59	2272.50	1038.5	0.042
	No	295	151.52	44698.50		
Technological competence	Yes	11	206.86	2275.50	1035.5	0.041
	No	295	151.51	44695.50		
Pedagogical competence	Yes	11	184.36	2028.00	1283	0.237
	No	295	152.35	44943.00		
Technological-pedagogical competence	Yes	11	241.82	2660.00	651	0.001
	No	295	150.21	44311.00		
Total scores	Yes	11	213.50	2348.50	962.5	0.022
	No	295	151.26	44622.50		

p<.05

Table 3. Results of the One-Way ANOVA test related to the perception of teachers of flipped learning self-efficacy in terms of the grade level taught variable

	Grade level taught	**n**	***M***	***SD***	***F***	***p***	**Difference**
Teacher self-efficacy	1st grade	58	31.21	5.51	1.01	0.385	
	2nd grade	90	31.54	4.21			
	3rd grade	82	32.45	5.12			
	4th grade	76	32.22	4.76			
Technological competence	1st grade	58	32.93	5.43	0.63	0.594	
	2nd grade	90	32.27	3.69			
	3rd grade	82	33.24	4.78			
	4th grade	76	32.89	5.33			
Pedagogical competence	1st grade	58	32.66	4.69	1.39	0.245	
	2nd grade	90	32.67	3.76			
	3rd grade	82	33.65	4.80			
	4th grade	76	33.84	5.34			
Technological-pedagogical competence	1st grade	58	11.48	1.96	1.73	0.161	
	2nd grade	90	11.32	1.82			
	3rd grade	82	11.99	2.08			
	4th grade	76	11.72	2.15			
Total scores	1st grade	58	108.28	15.83	1.26	0.288	
	2nd grade	90	107.80	10.96			
	3rd grade	82	111.33	13.96			
	4th grade	76	110.68	15.18			

competence sub factors of the teachers' perception of flipped learning self-efficacy in terms of grade level taught (teacher self-efficacy: F= 1.01, p= .385; technological competence: F= 0.63, p= .594; pedagogical competence: F= 1.39, p= .245; technological-pedagogical competence: F= 1,73, p= .161). In addition, a significant difference was not found in the total scores of flipped learning self-efficacy perception of the teachers in terms of the grade level taught (total: F= 1.26, p= .288).

Results of the One-Way ANOVA test related to the perception of teachers of flipped learning self-efficacy in terms of the professional seniority variable are given in Table 4.

It can be seen in the table that, there is no significant difference in the technological competence, pedagogical competence, and technological-pedagogical competence sub factors of the teachers' perception of flipped learning self-efficacy in terms of professional seniority (technological competence: F= 1.33, p= .258; pedagogical competence: F= 1.58, p= .178; technological-pedagogical competence: F= 1.86, p= .117). However, a significant difference was found between some of the groups in the teachers' perception of flipped learning self-efficacy and total scores in terms of professional seniority (teacher self-efficacy: F= 2.71, p= .030; total: F= 2.49, p= .043). According to the One-Way ANOVA test results, significant differences were found between the groups 11-15 years and over 21 years in the teacher self-efficacy sub-factor and total scores.

Results of the One-Way ANOVA test related to the perception of teachers of flipped learning self-efficacy in terms of the competency in using computers variable are given in Table 5.

It can be seen in the table, there is a significant difference in teacher self-efficacy, technological competence, pedagogical competence, technological-pedagogical competence sub-factors of the teachers' perception of flipped learning self-efficacy in terms of competency in using computers (teacher self-efficacy: F= 10.68, p= .000; technological competence: F= 7.22, p= .000; pedagogical competence: F= 6.48, p= .000; technological-pedagogical competence: F= 13.81, p= .000). In addition, a significant difference was found in the total scores of flipped learning self-efficacy perception of the teachers in terms of competency in using computers (total: F= 11.71, p= .000). According to the One Way ANOVA test results, significant differences were found between medium-good, medium-very good and good-very good groups in the teacher self-efficacy sub-factor; between weak-very good, medium-good and medium-very good groups in the technological competence sub-factor; between weak-very good, medium-very good and good-very good groups in the pedagogical competency sub-factor; between weak-very good, medium-good, medium-very good and good-very good groups in the technological-pedagogical competency sub-factor. In addition, a significant difference was found in the total scores between weak-very good, medium-good, medium-very good, and good-very good groups.

Results of the Kruskal-Wallis test related to the perception of teachers of flipped learning self-efficacy in terms of the using informatics technology devices in lessons variable are given in Table 6.

Table 4. Results of the One-Way ANOVA test related to the perception of teachers of flipped learning self-efficacy in terms of the professional seniority variable

	Professional seniority	n	*M*	*SD*	*F*	*p*	Difference
Teacher self-efficacy	0-5 years	48	31.98	4.94	2.71	0.030	11-15 years – above 21 years
	6-10 years	47	32.06	4.41			
	11-15 years	71	33.10	4.39			
	16-20 years	73	31.90	4.98			
	Over 21 years	67	30.42	5.18			
Technological competence	0-5 years	48	33.06	4.44	1.33	0.258	
	6-10 years	47	32.77	4.97			
	11-15 years	71	33.69	4.41			
	16-20 years	73	32.70	4.78			
	Over 21 years	67	31.85	5.13			
Pedagogical competence	0-5 years	48	33.69	4.67	1.58	0.178	
	6-10 years	47	33.00	4.97			
	11-15 years	71	34.08	4.40			
	16-20 years	73	33.15	4.35			
	Over 21 years	67	32.19	4.91			
Technological-pedagogical competence	0-5 years	48	11.88	1.97	1.86	0.117	
	6-10 years	47	11.74	1.81			
	11-15 years	71	11.96	1.93			
	16-20 years	73	11.56	2.02			
	Over 21 years	67	11.10	2.19			
Total scores	0-5 years	48	110.60	13.18	2.49	0.043	11-15 years – above 21 years
	6-10 years	47	109.57	13.65			
	11-15 years	71	112.83	12.41			
	16-20 years	73	109.32	14.06			
	Over 21 years	67	105.57	15.136			

Table 5. Results of the One-Way ANOVA test related to the perception of teachers of flipped learning self-efficacy in terms of the competency in using computers variable

	Competency in using computers	n	*M*	*SD*	*F*	*p*	Difference
Teacher self-efficacy	weak	17	32.12	5.61	10.68	0.000	Medium-good Medium-very good, Good-very good
	medium	124	30.59	5.09			
	good	130	32.12	4.13			
	very good	35	35.57	4.25			
Technological competence	weak	17	30.82	5.53	7.22	0.000	weak-very good, medium-good, Medium-very good
	medium	124	31.73	4.82			
	good	130	33.47	4.21			
	very good	35	35.17	4.93			
Pedagogical competence	weak	17	31.88	4.92	6.45	0.000	Weak-very good, medium-very good, good-very good
	medium	124	32.30	4.85			
	good	130	33.55	4.09			
	very good	35	35.89	4.73			
Technological-pedagogical competence	weak	17	11.12	1.79	13.81	0.000	Weak-very good, medium-good, Medium-very good, good-very good
	medium	124	11.03	1.94			
	good	130	11.82	1.88			
	very good	35	13.29	1.84			
Total scores	weak	17	105.94	16.16	11.71	0.000	Weak-very good, medium-good, Medium-very good, good-very good
	medium	124	105.65	14.24			
	good	130	110.96	11.51			
	very good	35	119.91	13.77			

Table 6. Results of the Kruskal-Wallis test related to the perception of teachers of flipped learning self-efficacy in terms of the using informatics technology devices in lessons variable

	using informatics technology devices in lessons	**N**	**Mean rank**	***SD***	***X*²**	***p***	**Mann Whitney *U***
Teacher self-efficacy	yes	237	159.70	2	5.19	0.074	
	no	7	129.86				
	partially	62	132.47				
Technological competence	yes	237	158.41	2	4.59	0.100	
	no	7	100.14				
	partially	62	140.74				
Pedagogical competence	yes	237	160.09	2	6.77	0.034	yes-no, yes-partially
	no	7	100.93				
	partially	62	134.26				
Technological-pedagogical competence	yes	237	161.68	2	9.54	0.008	yes-partially
	no	7	144.21				
	partially	62	123.29				
Total scores	yes	237	161.03	2	8.09	0.017	yes-partially
	no	7	105.79				
	partially	62	130.10				

As it can be seen in the table, there is no significant difference in teacher self-efficacy X^2 (sd=2, n=306) =5.19, $p>.05$ and technological competency X^2 (sd=2, n=306) =4.59, $p>.05$ sub-factors of the teachers' perception of flipped learning self-efficacy in terms of using informatics technology devices in the lessons variable. However, a significant difference was found between some of the groups in pedagogical competence X^2 (sd=2, n=306) =6.77, $p<.05$, technological-pedagogical competence X^2 (sd=2, n=306) =9.54, $p<.05$ sub-factors and the total scores X^2 (sd=2, n=306) =8.09, $p<.05$ of the teachers' perception of flipped learning self-efficacy in terms of using informatics technology devices in the lessons variable.

According to the Kruskal-Wallis test results, a significant difference was found between yes-no and yes-partially groups in the pedagogical competency sub-factor in favor of the yes answer; between yes-partially groups in the technological-pedagogical competency sub-factor in favor of the yes answer and between yes-partially groups in the total scores in favor of the yes answer.

DISCUSSION AND CONCLUSION

According to the findings of the study, a significant difference was not found in the teacher self-efficacy and pedagogical competence sub-factors of the teachers' perception of flipped learning self-efficacy in terms of gender, however, a significant difference was found in technological competence, technological-pedagogical competence, and total score values in favor of the male teachers. Taking this into consideration, it can be stated that the perception of the male teachers of flipped learning self-efficacy is higher compared to the female teachers. Similar to the study findings, in Kozikoğlu et al.'s study (2021), it was determined that the perception of male teachers of flipped learning self-efficacy was higher compared to female teachers. This can be interpreted as male teachers developing themselves in technology and technology literacy. In Güneş and Buluç's study (2017), it was found that male teachers are more efficient compared to female teachers in the lessons in terms of education technology, using educational software and being knowledgeable in new technologies, whereas female teachers think that the use of technology in the lessons takes up the time of teachers and experience concerns about meeting the learning gains on time.

A significant difference was not found in the pedagogical competence sub-factor in terms of the education on flipped learning variable, whereas a significant difference was found in teacher self-efficacy, technological competence, technological-pedagogical competence sub-factors and total scores of the perception of teachers of flipped learning self-efficacy in favor of teachers who have had education on flipped learning. Therefore, it can be stated that the perception of self-efficacy of teachers who have had education on flipped learning is higher compared to teachers who have not had such education. When the literature is reviewed, it can be seen that Kozikoğlu et al. (2021) determined in their study that the perception of flipped learning self-efficacy of teachers who have had in-service training on technology is higher compared to teachers who have not had such training. Teachers' having a high perception of flipped learning self-efficacy due to their in-service training on technology can be interpreted as an expected result. In addition, it can be stated that in-service training is a necessity to popularize flipped learning with the understanding that current teachers should be included in the education integrated with technology. Additionally, it can be interpreted as the success of in-service training and its contributions to teachers. However, in Erbil and Kocabaş's study (2019), the views of classroom teachers were asked, and it was found that most of the teachers did not know about the flipped classroom concept where flipped learning is applied and that those who knew about the subject needed more information. Therefore, the necessity of in-service training was stated as well.

When the grade level taught was taken as the basis, a significant difference was not found in teacher self-efficacy, technological competence, pedagogical competence and technological-pedagogical competence sub-factors and the total scores of the perception of the teachers of self-efficacy. Therefore, it can be stated that the teachers' perception of flipped learning self-efficacy in terms of the grade level taught is not affected in a positive or negative manner. It can be interpreted as teachers applying similar activities and methods in the grade levels they teach and that the use of technology in their grade levels are close to each other.

According to the findings of the study, a significant difference was not found in technological competence, pedagogical competence, and technological-pedagogical competence sub-factors in terms of the teachers' professional seniority. However, it was seen that there was a significant difference in the teacher self-efficacy sub-factor and the total scores between the 11-15 years and over 21 years groups in favor of teachers with 11-15 years of seniority. Therefore, it can be stated that teachers with 11-15 years of professional seniority have a higher perception of flipped learning self-efficacy compared to teachers with over 21 years of professional seniority. In addition, it can be stated that they develop themselves more in technology. Similar to the findings of the study, in Karaman and Kurfallı (2008) have also found that teachers with lower seniority use educational technology more in their lessons compared to teachers with high seniority. However, contrary to the findings of the study, Kozikoğlu et al. (2021) have determined that teachers' perception of flipped learning self-efficacy did not display any significant differences in terms of professional seniority. Ulaş and Ozan (2010) and Güneş and Buluç (2017) have reached the conclusion in their studies on classroom teachers' use of technology that, teachers with higher seniority are more knowledgeable in new technological subjects and that they are more efficient in using educational technologies.

When the teachers' competency in using computers was taken as the basis, a significant difference was found in teachers' self-efficacy, technological competence, pedagogical competence, and technological-pedagogical competence sub-factors. This difference was found in favor of the good group between the medium-good groups; in favor of the very good group between the medium-very good groups and in favor of the very good group between the good-very good groups in the teacher self-efficacy sub-factor. The difference was found in favor of the very good group between the weak-very good groups; in favor of the good group between the medium-good groups and in favor of the very good group between the medium-very good groups in the technological competence sub-factor. A significant difference was found between the weak-very good, medium-very good, and good-very good groups in the pedagogical competence sub-factor and in favor of the very good group in all the groups. In the technological-pedagogical competence sub-factor which is the fourth sub-factor of the scale, a significant difference was found between the weak-very good groups in favor of the very good group; between the medium-good groups in favor of the good group; between the medium-very good and good-very good groups in favor of the very good group. In the total score results, a significant difference was found between the weak-very good groups in favor of the very good group; between the medium-very good groups in favor of the good group and between the medium-very good and good-very good groups in favor of the very good group. Taking these results into consideration, it was determined that the flipped learning self-efficacy perception of the groups with better competency in using computers is higher compared to the groups with less competency. Therefore, providing in-service training to teachers to raise their competence in using computers, providing a sufficient level of technological devices to school and opening courses for teachers to improve themselves in terms of using computers can be suggested as necessary actions.

According to the findings related to the use of informatics technology devices by teachers in the lessons, a significant difference was not found in the teacher self-efficacy and technological competence sub-factors. However, a significant difference was found in the pedagogical competence and technological-pedagogical competence sub-factors and the total scores between the groups. This difference was found between the yes-no and yes-partially groups in favor of the yes group in the pedagogical competence sub-factor; between the yes-partially groups in favor of the yes group in the technological-pedagogical competence sub-factor and between the yes-partially groups in favor of the yes group in the total scores. Therefore, it can be stated that teachers who use informatic technology devices in the lessons have a higher perception of flipped learning self-efficacy compared to the teachers who partially use these devices or do not use them at all. With this finding in mind, it can be stated that teachers' use of informatics technology devices in the lessons contributes positively to their perception of technology. Additionally, it can be expressed that it is necessary for teachers to receive in-service training to improve their use of informatics technology devices in the lessons and for schools to be equipped with technological tools and devices to be suitable for education integrated with technology.

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