Does the Involvement of Teachers in the Process of Purchasing Equipment Affect their Work Satisfaction and Frequency of Use?

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Article Info	Abstract
	This study explores how purchasing digital technology in schools affects teachers' work satisfaction, how it affects usage frequency, and how different equipment purchase models affect usage frequency. The Slovenian school teachers included in the survey completed an online questionnaire designed for this research (n=288). Descriptive statistical analysis, Kruskal-Wallis and Mann-Whitney tests were performed and the results showed that there were no statistically significant difference between the work satisfaction of teachers and the frequency of use of digital technology in schools and their engagement in the equipment purchase of digital technology for teaching. Involving teachers in the procurement process would most likely also contribute to better use of the devices, as teachers would be able to purchase devices that they are familiar with. It would make sense to develop a strategy for the purchase of equipment at national level and at the level of individual schools.

Introduction

Over the years, there has been an increasing progress and development of individuals and society as a whole. As a result, education has also constantly changed. Until today, where more emphasis is placed on various competencies. In terms of education, the competencies of deeper understanding, flexibility of understanding, teamwork, adaptation, etc. are in the foreground. Increasing attention is also being paid to the quantity and quality of learning, which is accompanied by concerns that the educational models of the past and present are not sufficient. As a result, society is placing increasing importance on new approaches to teaching and learning. Digital technology (computers, smart devices, e-services, etc.) also contributes to this (Dumont and Istance, 2010). Therefore, knowledge has become the center of contemporary life, and its quality cannot be neglected. Knowledge depends on the acquisition of knowledge, so more attention should be paid to learning and teaching. But, as the OECD states, *"trends themselves and the knowledge, values and attitudes to be learned are complex and multi-faceted"* (Dumont and Istance, 2010, p. 22). And this should not be forgotten when creating learning environments.

The acquisition of knowledge today takes place in many different school environments. One of these learning environments is the so-called innovative learning environment, which includes innovative teaching. It is a process based on three concepts:

1. *The learner at the center of the learning process* (many opportunities must be created where the learner is invited to actively participate in the learning process);

2. *Competencies* (it is important that students develop various competencies, especially those of the 21st century, which are important for living in a modern, knowledge-based society);

3. *Use of technology* (the teacher becomes a facilitator of instruction through the meaningful and effective use of technology in the learning process - learning is in the hands of the students). (Inovativni pouk, 2020).

In innovative learning environments, traditional forms of work are increasingly being replaced by modern forms. Therefore, more research-based learning is in the foreground. As a result, the learning process becomes more comprehensive, and students are better able to apply knowledge in solving everyday problems, which is basically the goal of the new educational approaches. And as mentioned earlier, research-based learning also improves students' ability to work in a group, promotes communication skills, creativity, critical thinking, etc. - the competencies of the 21st century develop (Aberšek, 2018). It is important to understand that an innovative learning environment is understood as a set of different, interconnected dimensions: (1) students, (2) the teacher, and other relevant professionals, (3) learning content and (4) equipment and technologies. We should be clear that all four of these dimensions are inextricably linked in innovative learning environments. It is not only important who learns and what, but, as is clear from the design of innovative learning environments, who learns (students), with whom (teachers and professionals), what is the content of learning, and where is the place of learning (equipment and technologies are also an important part) (Dumont and Istance, 2010).

Let's focus on devices and technologies. Information and communication technology (ICT) is an integral part of innovative learning environments and innovative teaching. ICT in education, especially in innovative learning environments, provides critical support for innovative learning strategies. With the support of ICT in the classroom, the teacher can become the facilitator of instruction, and students can achieve established curricular objectives independently or with minimal assistance from the teacher through the use of technology (computers, tablets, smartphones, etc.). The use of ICT also allows them to stretch learning in time and space. This means that learning can continue in the afternoon, when there are no classes, and outside the classroom. (Inovativna učna okolja, 2020).

Procurement Models

More recently, an initiative called "bring your own device" (BYOD) has been developed to encourage participants in the instructional process to bring and use their smart device (phone, tablet, etc.). The increasing prevalence of mobile devices among (even younger) students has strengthened this model in the pedagogical process. The advantage of this model is certainly the good familiarity with one's device, which makes it easier to focus on the work. This model also promotes learning outside of the classroom, personal mobile devices are generally more powerful, promote better student organization, do not impose major costs on the school (especially acquisition costs), etc. Major drawbacks include the impact of all devices on network congestion, as well as the fact that bringing students' own mobile devices to school shows their social status; students may also not fill up devices,

may not have charging cables, etc. (Marčinković et al, 2019).

There are many similarities between the models of purchasing personalized tablets for students to take home (PDH) and leave at school (PDS). The main advantage is that the mobile devices are personalized. The student's work is saved and the student can pick up where they left off in the previous lesson the next time. The model where students receive personalized mobile devices and can take them home is largely similar to the BYOD model, except that it is the responsibility of the school, not the student, to purchase and select mobile devices. An advantage of this model is that everyone has the same mobile devices, which means that the social status of the individual is not as pronounced, it also means easier work, since they all work with exactly the same operating system, the same programs (this is, of course, the case if the school buys exactly the same devices for all students). The weaknesses are similar to those of the BYOD model: a possible lack of chargers can make work difficult, the network can be overloaded, etc. The model of procuring personalized devices that students leave at school (PDS) has some differences from the BYOD and PDH models. If the school purchases the same device models, it is easier to organize because everyone is using the same device and the same program. However, the major problem with this model is that students can only use this device in the classroom and cannot take it home. Thus, learning is not extended in time and space as in the first two models. In addition, this procurement model places a greater burden on the teacher, who is basically responsible for ensuring that the devices are charged, updated, and ready for immediate use. In principle, the teacher is also responsible for any problems with the operation of the devices.

The advantages of the mobile classroom model (MC) are certainly that there is no status position, the work is easier to organize because the teacher can study the equipment in advance, all students work with the same equipment, etc. The disadvantages are similar to the purchase model where students leave their devices at school - learning time is not extended, students cannot use the tablet at home, teachers are more burdened because they have to take care of the devices, etc. Since the devices are not personalized, students may lose their previous work. It should also be emphasized that this model requires coordination among staff. School staff must first confer and coordinate with each other to make these devices available for use in their classroom (unless they have a sufficient number of devices in the school). However, this model also reduces the time required to use the devices, as the devices may not be available all the time and the teacher may not be able to use them in their classroom even if they want to. The main advantage, however, is that such a procurement model is cheaper for the school, since in this case it purchases fewer devices, which are cheaper and can be used by more students.

Research Problem

A European survey on the use of ICT in education (2nd Survey of Schools: ICT in Education, 2019) from 2017/18 showed that there is a large gap in the use of ICT in Slovenian schools. It shows that Slovenian schools are equipped with ICT at the European Union (EU) average. At the same time, the same survey revealed that Slovenia has the lowest percentage of students using a computer for instruction at least once a week among all EU countries. The results of the survey indicate a growing gap between Slovenian schools that are well equipped with ICT and below-average use of ICT. Possible reasons for this situation include the involvement of teachers in the procurement process, consideration of their wishes, the strategy of equipment procurement at the school (and also

at the national level), models for equipment purchase, etc. The aim of the study was to explore whether teachers' involvement in the purchasing process affects their psychophysical state and also the frequency of use of these devices in the classroom.

The following hypotheses were set:
- Hypothesis 1: Teachers' involvement in the process of creating innovative learning environments has a positive effect on their psychosocial status. Teachers who are involved in the process of acquiring equipment will show higher work satisfaction.
- Hypothesis 2: Teacher involvement in the procurement process positively affects the frequency of equipment use.
- Hypothesis 3: The school's model for equipment procurement will influence the frequency of equipment use in the classroom.

Methodology

An online questionnaire was developed for the study that included questions about various models of device acquisition and frequency of device use in the classroom. The results of the questionnaire made it possible to examine the gap between the well-equipped Slovenian schools with digital devices and the below-average use of devices in the classroom. An online questionnaire included several statements to which respondents were asked to indicate their agreement or frequency of use.

Teachers who responded to the survey were asked if the school they teach at is looking at purchasing technology. They had to confirm or deny the statement The school administration involves me in the process of equipping the school with ICT. Teachers were also asked if they were satisfied with their work as teachers at the school where they are employed.

A 4-point Likert scale was offered for responses: 1 - *Strongly Disagree*, 2 - *Disagree*, 3 - *Agree*, and 4 - *Strongly Agree*. Teachers were also asked how often they use technology in the classroom. A 6-point scale was used for responses: 1 - *Never*, 2 - *Once a year*, 3 - *2-4 times a year*, 4 - *5-10 times a year*, 5 - *1-3 times a month*, and 6 - *Once a week or more*. Teachers were also asked which model of equipment purchase is predominant in their school (so far, four models are available). Four answers were available (four models of equipment procurement, presented in more detail in the introductory part), and teachers had to choose the one that was most characteristic of their school.

The research results were obtained through an online questionnaire answered by a total of 288 teachers from various Slovenian primary and secondary schools. The online questionnaire was created using the open-source online survey application 1ka.si. The link was sent via an electronic list and offered to schools participating in the project Innovative Learning Environments with Supported by ICT - Innovative Pedagogy 1:1 (75 primary and secondary schools are participating in the project).

The decision whether to answer the questions of the questionnaire or not was left to the individual teachers. Participants were informed that participation in the survey was completely anonymous before completing the questionnaire. Some of the teachers who participated in the survey already teach in innovative learning environments. This was considered in the analysis of the results, which found differences in the frequency of device use in innovative learning environments and other learning environments.

Data were processed using IBM SPSS Statistics software. Descriptive cross-tabulations were calculated for the simultaneous analysis of two variables, as the relationship between each variable was sought. To determine the statistical characteristic similarity of each variable, the characteristic level (significance) was also calculated. A Kruskal-Wallis test (to confirm the first and second hypotheses) and a Mann-Whitney test (to confirm the third hypothesis) were also performed, both at the 95% confidence level.

Results

Table 1 shows the results of the analysis comparing satisfaction with teachers' work depending on whether or not they are involved in the process of acquiring equipment at the school. The results show that there are more such teachers who are not involved by the school management in the process of procurement of equipment at the school. Also, a greater percentage of teachers show satisfaction with their work. At the same time, Asymp. Sig. (2-sided) indicates that the statistical variables are not statistically different from each other. This was further confirmed by a Mann-Whitney test with the following results: $U = 9176.5$ and $p = .167$. The test thus showed no statistically significant differences between job satisfaction and whether or not teachers are involved in the school's equipment purchasing process.

Table 1. Teachers' Work Satisfaction Regarding Involvement in the Procurement of Equipment

		1	2	3	4	Total	Asymp. Sig. (2-sided)
The school management does not involve me in the process of equipping the school with ICT.	f	0	12	112	51	175	
	%	0	6.8	64	29.1	100	
The school management involves me in the process of equipping the school with ICT.	f	1	5	65	42	113	.266
	%	.9	4.4	57.5	37.2	100	
Total	f	1	17	177	93	288	
	%	.3	5.9	61.4	32.4	100	

Note: *1 - Strongly Disagree, 2 - Disagree, 3 - Agree, and 4 - Strongly Agree*

The data in Table 2, where teachers were asked how often they use technology in their teaching (the results are analyzed according to whether the school involves teachers in the process of acquiring equipment at the school or whether the school acquires equipment for teaching independently of the teacher), shows that technology is more often integrated in the classroom by teachers involved in the process of acquiring equipment. On the other hand,

Asymp. Sig. (2-sided) shows that the variables are not statistically significantly different from each other. A Mann-Whitney test was also performed, with the following results: U = 9231 and p = .089. Again, the test showed no statistically significant differences.

Table 2. Frequency of Equipment Use in Relation to Teacher Participation

		The school management involves me in the process of equipping the school with ICT.	The school management does not involve me in the process of equipping the school with ICT.	Total	Asymp. Sig. (2-sided)
Once a year	f	3	1	4	
	%	75	25	100	
2-4 times a year	f	7	2	9	
	%	77.8	22.2	100	
5-10 times a year	f	18	13	31	
	%	58	41.9	100	.393
1-3 times a month	f	54	33	87	
	%	61	37.9	100	
Once a week or more	f	83	74	157	
	%	52.8	47.1	100	
Total	f	165	123	288	
	%	57.2	42.7	100	

The results for the impact of the device procurement model on the frequency of technology use in the classroom are discussed in detail in this section. Among teachers using the BYOD model, most, 59 %, use instructional technology at least once per week, as shown in Table 3, followed by responses 1-3 times per month and 5-10 times per year. Other responses are less prevalent.

In the model where students receive personalized devices to take home (PDH), most teachers use technology for instruction once per week, followed by responses 1-3 times per month, as shown in Table 3. The results are similar to the BYOD and PDH models for the model where students receive personalized devices that they leave behind at school. However, differences are observed in the mobile classroom model (MC).

The largest proportion of teachers using technology for instruction still responds once per week, but the proportion of these teachers is lower than in the other models. This is followed by a response 1-3 times per month and then a response 5-10 times per year. However, in all models, the statistical variables are not statistically different. This is confirmed by the Kruskal-Wallis test, where the results were as follows: BYOD model: H(3) = 1.414, p = .702, PDH model: H(3) = .469, p = .926, PDS model: H(3): 4.878, p = .181, and MC model: H(3) = 4.480, p = .214. No statistically significant difference was found for any of the models in terms of the frequency of use of the devices.

Table 3. The Impact of the Device Acquisition Model on the Frequency of Technology Use in the Classroom

		Once a year	2-4 times a year	5-10 times a year	1-3 times a month	Once a week or more	Total	Asymp. Sig. (2-sided)
BYOD model	f	2	4	10	27	61	104	.628
	%	1.9	3.8	9.6	25.9	58.6	100	
PDH model	f	0	1	2	8	21	32	.678
	%	0	3.1	6.3	25	65.6	100	
PDS model	f	0	2	6	7	27	42	.231
	%	0	4.8	14.3	16.7	64.3	100	
MC model	f	2	5	25	71	101	204	.034
	%	.9	2.4	12.2	34.8	49.5	100	

Discussion

Statistical analysis has shown that, in general, there are no statistically significant differences in work satisfaction depending on whether or not teachers are involved in the equipment procurement process. The reasons for this are most likely due to the fact that equipment is not purchased very often in schools, so the involvement or non-involvement in the procurement of equipment in the school is not that important to the teacher and consequently does not affect their work satisfaction. Nevertheless, as Fertika et al. (2022) point out, it is essential that schools maintain the quality of their devices and the infrastructure they use for teaching, as this is the only way they can remain operational. The first hypothesis, which states that teacher participation in equipment procurement affects work satisfaction, can be refuted because no statistically significant difference was found in the data analysis. Wahu et al. (2015), on the other hand, report that the efficiency of equipment procurement generally contributes to the performance of an organization, leading to savings, higher quality of the equipment purchased and also to higher internal satisfaction. This implies that, at least partially, teachers' involvement in the process of purchasing equipment in their school could have an impact in the longer term in various areas, most importantly in the area of work satisfaction. This is also supported by the research of Rolfe et al. (2022), as their findings show that it is the purchase of equipment that has an impact on the well-being of employees and also on good educational outcomes.

Analysis of the data showed also that there is no statistically significant difference in the frequency of educational technology use between teachers who are involved in the procurement process and teachers who are not involved in the procurement process. We reject the second hypothesis.It appears that teachers choose to use digital devices in the classroom regardless of whether or not they were able to contribute their ideas and suggestions for the purchase. Most likely, the reason is the tendency and necessity to use technology in the classroom, so teachers use the devices and do not pay attention to whether they could contribute their purchase suggestions or not. The results likely show that teachers are engaged and flexible enough to incorporate digital devices into the classroom, regardless of their input on the purchase. It is more important for teachers to focus on the experience of quality teaching and learning than on how often teachers use or will use modern ICT equipment for teaching purposes

(Juuti et al., 2022). In general, therefore, it is not so important whether teachers are involved in the process of purchasing equipment at school or not, because, as Murillo and Román (2011) state, it is more important that schools invest in resources because this has a positive impact on student achievement.

The third hypothesis can also be refuted, as the results showed no statistically significant difference between the models of device use and frequency of device use. As it turns out, it does not matter how the devices are used for instruction (whether students bring their own devices or whether the school provides them). Regardless of the model, they are primarily used in the classroom. It seems that teachers (and also students) adapt to the model that is used in the school. Nevertheless, some advantages and disadvantages of each model can be identified and are described in the introductory part of the paper. It would be interesting to explore what teachers' attitudes would be toward each model if they could be tested for a while. It is reasonable to assume that larger (perhaps even statistically significant) differences between the individual models and the frequency of use of the devices would then become apparent if teachers were able to identify the possible advantages and disadvantages of each model. Thus, it can be assumed that the results of this analysis do not show differences precisely because teachers do not have the opportunity to test individual models.

Conclusion

The study found that there were no statistically significant differences affecting teachers' work satisfaction and frequency of using digital devices in the classroom based on whether or not they were involved in the equipment procurement process in the school. Also, no statistically significant difference was found between the frequency of using digital devices in the classroom and the acquisition pattern of the devices. Considering the fact that Slovenian schools are well equipped with digital technology that can be used for teaching and that the frequency of use is very low, the reasons for this discrepancy cannot be found in teachers' involvement in the equipment procurement process. As the results of our analysis show, participation does not affect the frequency of device use, so greater teacher involvement in the device procurement process does not seem to reduce the resulting discrepancy. Nevertheless, we believe that it would be useful to involve teachers more frequently in the procurement process, since it is the teachers who will be using the digital devices in the classroom. Therefore, it would be good if teachers could provide their opinions and suggestions for the procurement. Involving teachers in the procurement process would most likely also contribute to better use of the devices, as teachers would be able to purchase devices that they are familiar with. It would make sense to develop a strategy for the purchase of equipment at national level and also at the level of individual schools. A possible centralized unit in charge of equipment procurement could ensure better coordination of equipment purchases and simplify the procurement process (Olawole, 2024). Adequate training of all stakeholders involved in the procurement of equipment in schools is also important (Oduma and Getuno, 2017). The possible involvement of teachers would certainly be an added value, as they would have the opportunity to participate in the purchase of equipment for teaching. Teacher involvement is particularly important because teachers are the ones who will use the equipment. It is also the teachers who work in the classroom and know the students and their abilities best, which contributes significantly to the choice of appropriate equipment.

We believe that the area of teacher involvement in the equipment procurement process still has enough potential for research, and it would also be useful to open discussions about it on a national and broader scale. After all, the input of everyone involved in education will contribute to an orderly area of equipment procurement in education.

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