

UDC 37.064-058.855]:578.834[covid-19](477)

doi: 10.15330/jpnu.10.3.208-217

## TABLETS IN HIGH SCHOOL EDUCATION AN EXPLORATION OF STUDENT PERSPECTIVES IN THE CONTEXT OF PERSONALITY TRAITS AND PROFESSIONAL PREFERENCES

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**Abstract.** The relevance of the topic is due to the active implementation of tablets in educational activities, which prompts the need to consider the students' views in Polish secondary schools, where tablets serve as effective tools at all lessons. The article presents a possible connection between personal traits and the use of electronic devices for educational purposes. The present study comprised a participant group of 55 students (29 females, 22 males, with 4 participants choosing not to declare their gender) from the High School in Bielsko Biała, Poland. Notably, this institution has adopted iPads as integral tools for all modes of instruction since 2021, encompassing individual, collaborative, and collective approaches to organize learning. The participants included young individuals aged between 16 and 19. The research was carried out by using the diagnostic survey method, as well as two psychological tests: NEO Five-Factor Inventory NEO-FFI by P.T. Costa and R.R. McCrae - Polish adaptation (Zawadzki et al., 1998) and Multidimensional Preference Questionnaire WKP (Matczak et al., 2006). As the main results showed, respondents admitted that using a tablet helps to acquire new information faster, and in this way, learning becomes more interesting and engaging. Students with a higher level of conscientiousness appreciate those aspects of using a tablet that is related to fulfilling school duties and learning. A correlation between students' academic performance and the degree of extroversion can be observed in areas where tablet the usage is intertwined with social interactions. The results also indicate a possible relationship between the perception of tablet use and the level of need for stimulation in the work/study environment.

**Keywords:** digital education, iPads, mobile education, tablets-based learning, technology in didactics.

### 1. INTRODUCTION

Technology in school education is prevalent in modern times, encompassing both instructional methods and tools at the disposal of students and teachers. A well-designed teaching and learning process considers the educational objectives, content, forms, methods, media, and technologies. The years 2020-2022 were marked as a period of certain revolution in many schools in Poland, with the implementation of technological tools in various forms of synchronous and asynchronous remote education and traditional in-person education. Among the more popular devices are tablets and iPads, which are used independently of the necessity of remote education as driven by crisis situations. In some schools, it has been decided that these devices will be present in the teaching and learning process

for almost every subject.

One of the key success factors, alongside technological availability and teacher competence, is students' opinion regarding using such devices in their daily education based on their individual preferences, competencies, and personality traits. The objective of the conducted research was to analyze the opinions of students in a Polish high school, where tablets are mandatory tools in the course of education across all subjects, and to verify the personality traits and professional preferences that may influence the usage of tablets and iPads in the context of learning with their utilization.

## 2. THEORETICAL BACKGROUND

At present, we find ourselves at a crossroads: on the one hand, the popularity of utilizing tablets in education continues to rise, and many countries include these portable devices in their educational policies and classroom practices (e.g., the USA). On the other hand, certain countries plan to prohibit the use of such technologies, including tablets and smartphones, in schools starting since 2024 (e.g., the Netherlands) (Meijer, 2024). Extensive scientific research has addressed several issues, such as teachers' perceptions and opinions regarding tablet and iPad usage and similar technologies (Kim, 2019), students' opinions on the matter (Hammer, 2021; Soffer, 2017), tablet usage in specific educational domains, the impact of tablet use on student education in the literature review (Falloon, 2023), and negative aspects of tablet utilization (Boon, 2021).

The findings of comprehensive literature review analyses in the field have demonstrated a prevailing tendency towards a positive influence of tablets on educational outcomes, as opposed to cases where their use exhibits no discernible impact or a negative effect (Haßler, 2016).

The positive conclusions drawn from the research are as follows: "In general, the introduction of tablet devices entails a shift in the way students learn, as the devices provide interactive, media-rich, and exciting new environments." (Montrieux, 2015). On the other hand: "The most common barriers identified by teachers were student and teacher attitude and preference. The low frequency of iPad use seemed to relate to the lack of learning activities involving creativity and collaboration." (Kalonde, 2017).

This article focuses on research conducted among a group of high school students attending a school where tablets are used by teachers in almost every subject. Each student possesses such a device and employs it in various forms during nearly every lesson. The primary aim of the research was to explore the opinions of this group of students regarding the pedagogical process supported by these devices.

To establish a theoretical framework for our research, we draw upon well-established theories from the fields of education, psychology, and technology adoption. Among these theories there is the Technology Acceptance Model (TAM), proposed by Davis (1989) (Silva, 2015), which is widely recognized and employed to understand users' acceptance and adoption of technology. Additionally, the Uses and Gratifications Theory, advanced by Katz, Blumler, and Gurevitch in 1970, is a communication theory focused on understanding individuals' motivations for choosing and using media to fulfill specific needs and goals (Katz, 1973). These gratifications can be categorized into information acquisition, identity reinforcement, social integration and interaction, and entertainment (McQuail, 1994).

Given the potential dependence of technology usage in education, particularly tablets, on individual personality traits, we turn to the Five-Factor Model proposed by Costa and McCrae (1985). This model claims that human personality can be understood through five fundamental dimensions, namely Openness to Experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism (Costa, & McCrae, 1992). By examining the interplay between personality traits and tablet-based learning, our study aims to provide valuable insights into students' attitudes and preferences toward these devices in the educational context.

### 3. RESEARCH OBJECTIVE AND METHODOLOGY

In the course of the investigation, research problems regarding the perception of tablets at school were identified:

- How do the surveyed high school students perceive the use of tablets at school?
- What areas of tablet use at school were rated the highest by teenagers?

In order to determine whether students with different personality traits perceive the use of tablets in school differently, the following research problem was formulated:

- Is there a correlation between selected personality traits and the use of tablets in the school space?

The research was carried out using the diagnostic survey method (an online survey). The tools were placed on a research platform and distributed to students. In addition to the diagnostic survey, two psychological tests were used: NEO Five Factor Inventory NEO-FFI by P.T. Costa and R.R. McCrae - Polish adaptation (Zawadzki, 1998) and Multidimensional Preference Questionnaire WKP (Matczak, 2006). The survey questionnaire contained questions constructed using a Likert scale, in which students assessed the use of a tablet in various aspects of functioning in the school environment developed on the basis of the Uses and Gratifications Theory (McQuail, 1994).

Due to the specificity of the research group, purposeful selection of the sample was used. The selection criteria can be defined as attending a school where learning is carried out with the use of iPads. All students in the school were invited to participate in the study. More than half agreed to complete the research tools. The study involved 55 students (29 women and 22 men; 4 people did not declare their gender) of the High School in Bielsko Biała<sup>1</sup>, which from 2021 has been educating students using iPads in all forms of teaching (both in individual, team and collective work). The respondents are young people aged 16 to 19. The vast majority of respondents intend to study after graduating from high school.

### 4. RESULTS AND DISCUSSION

#### *Assessment of the use of tablets in the school environment*

In the first part of the questionnaire, students had to indicate how much they agreed with each statement regarding the use of a tablet in the school environment. They answered using a five-point scale (1 - I do not agree at all; 5 - I completely agree). Assessments of selected aspects of tablet use are included in the table below.

Tab. 1

*Evaluation of selected aspects of tablet use at school - students' opinions*

Selected aspects of tablet use at school		Assessment of teenagers
Using a tablet helps me access information faster and easier	Mean	4.36
	St. deviation	0.88
Using a tablet makes learning more interesting and engaging	Mean	4.0
	St. deviation	1.08
I only use a tablet at school	Mean	2.16
	St. deviation	1.30
Tablets do not help me study	Mean	2.05
	St. deviation	1.17
I would prefer teachers not to use tablets in my school	Mean	2.27
	St. deviation	1.37
Tablet use should be reduced in my school	Mean	2.20
	St. deviation	1.17

<sup>1</sup> Liceum Ogólnokształcące Towarzystwa Szkolnego im. Mikołaja Reja, <https://www.rejbb.pl/>

Teenagers admitted that using a tablet helps acquire new information faster and easier (M 4.36; SD 0.88), and this way learning becomes more interesting and engaging (M 4.0; SD 1.08). The statements with which the students did not agree concerned the negative attitude towards the use of tablets at school. In their opinion, the use of tablets at school should not be reduced (both among students and teachers). What is more, according to students, their use of tablets is not limited to the school space.

The students' beliefs are consistent with the results of the research conducted by other researchers. Young people are attached to new technologies, perceiving them as entertaining, making learning easier due to their eye-catching features (Baytak, 2011; Raut & Patil, 2016).

High school students are not of the opinion that teachers should limit the use of tablets and new technologies. It is important for them to cooperate with the teacher using technology, which is confirmed by the results of research conducted so far in this area. The research review developed by Jaafar and others includes papers focusing on the interplay of technology integration and the teacher-student relationship on the social, emotional and academic success of students (Jaafar, 2021)

Tab. 2

*Frequency of tablet use in various school activities – students' opinion*

Frequency of tablet use in various school activities		Assessment of teenagers
Taking notes during the lesson	Mean	4.35
	St. deviation	1.01
Doing homework	Mean	4.07
	St. deviation	1.08

Among the activities during which the tablet is most often used, students indicated taking notes in class and doing homework.

The differences between the first, second, third and fourth grades were also considered when analyzing the results of students' opinions. Statistically significant differences between individual age groups cannot be identified. The lack of significant differences means that students of the first grade evaluate working with the tablet in the same way as students of the second, third and fourth grades.

When asked about school subjects in which the use of tablets and new technologies is the most useful, high school students indicated mathematics, Polish, a foreign language and geography. The use of a tablet in physical education was rated the lowest, which is not a surprising result.

#### *Tablet use and extraversion*

In those aspects where the use of a tablet is related to social relations, a correlation between students' opinions and the level of extroversion can be indicated. One should note that these correlations are relatively weak, or at most at an average level.

There was a statistically significant positive correlation between the level of extraversion and the opinions of using a tablet in relation to relationship with other people. Students with a higher level of extraversion appreciate the use of a tablet to connect with peers (also in their spare time) and the teacher, as well as express themselves. For them, the tablet is more often a tool to cooperate and participate in team activities. They admit that the tablet facilitates cooperation and makes teamwork more attractive.

*Extraversion and selected aspects of using a tablet in the students' assessment*

<b>Aspects related to social relations</b>		<b>Extraversion</b>
The perception of the tablet as a tool to improve the ability to collaborate with classmates	Spearman's rho p-value	0.308* 0.022
The perception of the tablet as a tool to make cooperation more attractive	Spearman's rho p-value	0.334* 0.013
The perception of the tablet as a tool to contact peers in leisure time	Spearman's rho p-value	0.376** 0.005
The perception of the tablet as an object of peer recognition	Spearman's rho p-value	<b>0.419**</b> <b>0.001</b>
The perception of the tablet as a tool to express yourself	Spearman's rho p-value	<b>0.439***</b> <b>&lt; .001</b>
The perception of the tablet as a tool to stay connected with others	Spearman's rho p-value	0.296* 0.028
Evaluation of the impact of the tablet on contact with peers	Spearman's rho p-value	0.392** 0.003
Evaluation of the impact of the tablet on contact with teacher	Spearman's rho p-value	<b>0.464***</b> <b>&lt; .001</b>
Declared frequency of using the tablet to collaborate with classmates	Spearman's rho p-value	0.387** 0.004
Declared frequency of using the tablet to participate in online discussions	Spearman's rho p-value	0.369** 0.006
<i>*p&lt;0.05, **p&lt;0.01, ***p&lt;0.001</i>		

**Tablet use and conscientiousness**

Significant correlations were also noted for conscientiousness and those aspects of tablet use that relate to school duties and the acquisition of new knowledge. One should note that these correlations are relatively weak, or at most at an average level.

*Conscientiousness and selected aspects of using a tablet in the students' assessment*

<b>Aspects related to learning and school duties</b>		<b>Conscientiousness</b>
The perception of the tablet as a tool to understand complex concepts and ideas	Spearman's rho p-value	0.370** 0.006
The perception of the tablet as a tool to learn new things	Spearman's rho p-value	0.395** 0.003
The perception of the tablet as a tool enabling access to knowledge	Spearman's rho p-value	0.323* 0.016
Evaluation of the impact of the tablet on school achievements	Spearman's rho p-value	0.363** 0.007
Evaluation of the impact of the tablet on level of understanding new information	Spearman's rho p-value	0.330* 0.014
Evaluation of the impact of the tablet on inner sense of success	Spearman's rho p-value	0.480*** <b>&lt; .001</b>
Evaluation of the impact of the tablet on the student's creativity	Spearman's rho p-value	0.470*** <b>&lt; .001</b>
Evaluation of the impact of the tablet on contact with teacher	Spearman's rho p-value	0.348** 0.006
Declared frequency of using the tablet to developing own interests and passions	Spearman's rho p-value	0.367 0.006
<i>*p&lt;0.05, **p&lt;0.01, ***p&lt;0.001</i>		

Students with a higher level of conscientiousness appreciate those aspects of using a tablet that are related to fulfilling school duties and learning. In their opinion, working with a tablet contributes to the development of students' creativity and a sense of success. For them, the tablet is more often a tool to develop their own interests and gather knowledge. Acquiring new information by using tablets and new technologies becomes easier, also in the context of explaining complex concepts and ideas. In this way, in the opinion of students with a higher level of conscientiousness, the tablet is important for school achievements. While fulfilling their school duties, these students also appreciate the opportunity to establish contact with the teacher.

**Tablet use and the need for a stimulating work environment**

Among the important results, the correlation between students' opinions and their preferences for a stimulating work environment was also considered. A high need for stimulation relates to the nature of the activities at work and the environment of the activity itself.

Tab. 5

*The need for stimulation and selected aspects of using a tablet in the students' assessment*

Selected aspects of using tablets at school		The need for stimulation
The perception of the tablet as a tool to improve the ability to collaborate with classmates	Spearman's rho p-value	0.393** 0.003
The perception of the tablet as a tool that is necessary for learning and education	Spearman's rho p-value	0.300* 0.026
The perception of the tablet as a tool that makes it difficult to concentrate on the lesson	Spearman's rho p-value	-0.270* 0.046
The perception of the tablet as a tool to express yourself	Spearman's rho p-value	0.269* 0.047
The perception of the tablet as an object of peer recognition	Spearman's rho p-value	0.350** 0.009
<i>*p&lt;0.05, **p&lt;0.01, ***p&lt;0.001</i>		

Students with a higher need for stimulation disagree with the statement that the tablet distracts concentration during the lesson. They appreciate its value as a learning and collaboration tool. The indications of this group of students are the correct interpretation of the functioning of people with a high need for stimuli in the school and work environment (Matczak, 2006). They can simultaneously process more information from different sources and directions. These students work better where the stimulation is multi-sensory and intense, both in terms of physical and social stimulation (the presence of other people, pressure and risk). A calm working environment is not conducive to their activities. New technologies are therefore a perfect complement to their learning space and the possibility for diverse, engaging learning. Using the tablet as a communication tool and sensory stimulation realizes their high need for stimulation in the workplace.

Summing up the indicated relationships, it can be stated that the perception of using tablets by students of upper secondary schools is related to selected personality traits and the style of functioning in the workplace. Extraversion is related to those aspects that can be defined as social and self-expression, while conscientiousness distinguishes those aspects of tablet use that relate to school work and study. What differentiates students' perceptions of new technologies at school is also their need for stimulation in the workplace. After considering all the collected results one should note that the study did not analyze the real use of tablets, but only the opinions and declarations of high school students. Therefore, all the conclusions from the research concern students' beliefs, limited by their own perception, and not real behavior.

### *Personality traits and new technologies*

Research on the relationship between FFM personality traits with the use of new technologies has been undertaken by various research teams, in different contexts and different theoretical concepts. Most research reports are consistent and not mutually exclusive: researchers emphasize the importance of personality traits for the perception and use of new technology.

An interesting investigation was conducted by Tim Barnett and others in 2015. The study took an interactional psychology perspective, linking components of the FFM to the use of technology within the conceptual framework of the Unified Theory of Acceptance and Use of Technology (UTAUT). The variables that were tested are FFM personality traits and technology use in the context of a web-based classroom technological system, utilizing measures of perceived and actual use of technology. Consistent with researchers' expectations, conscientiousness and neuroticism were associated with perceived and actual use of technology. They noticed positive association between conscientiousness and perceived and actual use, which was the opposite direction to the relationship with neuroticism. Extraversion was also significantly associated with actual use, although not in the positive direction expected (Barnett, 2015).

The research procedure described in this article focuses rather on the Uses and Gratifications Theory. Other studies have noted the relationship between personality traits and Technology Acceptance Model components (Svendsen, 2013). The results of the investigation indicate that personality traits influence behavioral (BI) intention both directly and mediated through the TAM beliefs. Extraversion has significant, positive relations to BI and this relation is fully mediated by the TAM beliefs. Also, openness to experience is significantly and positively related to perceived ease of use, whereas emotional stability is only related to BI (without mediation by TAM beliefs).

Research on the relationship between the use of technology and personality or temperament traits is also conducted extensively in the school environment. In the paper published in 2016, differences in the use of technology depending on personality among middle school students were examined. The majority of teenagers indicated games as their favorite pastime. However, some differences in temperament were noted. Students with an analytical personality declared the most diverse use of technology and rated their skills in this area much higher on self-assessment scales than their peers. They also achieved a higher level of proficiency compared to the group (Sterling, 2016).

What is more, the relationship between technology and personality has also been noticed by researcher from Shanghai University. They conducted positive effect that new-media use has on extraversion, openness and agreeableness through the sense of belonging. The relationships were more significant for women (Xue, 2018).

## **5. CONCLUSION**

The described scientific research addressed three main issues mentioned in the methodology section. It was conducted within a rather specific and limited environment, which may serve as a constraint for generalizing the results to other contexts. However, on the other hand, it could provide an excellent depiction of an innovative institution's situation that fearlessly integrates technology across all school subjects while prioritizing students' well-being.

Concerning students' views regarding the use of tablets and iPads in the context of their personality traits, the following observations were established:

- Teenagers acknowledged that using tablets augments the assimilation of information, thereby rendering the learning process more captivating. However, discordance emerged about adverse tablet perceptions within educational settings. Students advocated for the continuous integration of tablets, underscoring their pertinence beyond the confines of classrooms.
- Students predominantly utilize tablets for the purpose of note-taking during instructional sessions and for the completion of homework assignments.

- A statistically significant positive correlation surfaced between levels of extraversion and perceptions surrounding using tablets in interpersonal interactions. Students displaying higher levels of extraversion demonstrated a proclivity for employing tablets to facilitate connections with peers, encompassing both leisure moments and scholastic pursuits. Moreover, this entailed facilitating teacher interactions and enabling avenues for self-expression. Additionally, students with elevated conscientiousness exhibited a proclivity for tablet utilization in domains linked to academic responsibilities and learning endeavors. This subset of students posited that tablet engagement fosters creativity and nurtures a sense of accomplishment. In contrast, participants characterized by heightened needs for stimulation diverged from the notion that tablets impede concentration during instructional sessions. Instead, they embraced tablets as potent instruments for both learning and collaborative initiatives.

A limitation of the study pertains to the modest sample size, albeit attributed to the subject matter's particularity and the educational institution's distinctive nature. Future investigations warrant consideration, such as longitudinal studies within the same cohort of students examining the impact of tablet usage on their academic success and prospective vocational endeavors. Furthermore, it would be interesting to scrutinize the levels of social competencies exhibited by individual students and their dispositions toward emerging technologies, including tablets.

**Acknowledgements:** The authors of the articles would like to thank the Management, Teachers and Students of the Liceum Ogólnokształcące Towarzystwa Szkolnego im. Mikołaja Reja in Bielsko-Biała, Poland (M. Rej General Secondary School in Bielsko Biała) for the opportunity to conduct research in their high school society.

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**Received:** August 12, 2023; **revised:** August 25, 2023; **accepted:** September 28, 2023; **published:** September 30, 2023.

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Франя Моніка, Скоп Кароліна. Планшети в середній освіті – дослідження поглядів студентів у контексті особистих рис і професійних уподобань. *Журнал Прикарпатського університету імені Василя Стефаника*, 10 (3) (2023), 208-217.

Актуальність теми зумовлена активним упровадженням планшетів у навчальній діяльності, що спонукає до потреби розгляду думок студентів в польській середній школі, де планшети слугують дієвими інструментами на всіх уроках. У статті представлено можливий зв'язок між особистими рисами та використанням електронних пристроїв у навчальних цілях. Проведене дослідження включало групу учасників із 55 студентів (29 жінок, 22 чоловіків, при цьому 4 учасники не зазначили свою стать) із середньої школи в Бельсько-Бяла, Польща. Вагомим є факт, що цей заклад з 2021 року прийняв iPad як невід'ємні інструменти для всіх форм навчання, включаючи індивідуальні, колективні та спільні підходи до організації навчання. Учасниками дослідження стали молоді особи віком від 16 до 19 років. Дослідження було проведено за допомогою діагностичного опитувального методу, а також двох психологічних тестів: NEO Five-Factor Inventory NEO-FFI від Р.Т. Costa та R.R. McCrae – польська адаптація (Б. Завадські та ін., 1998) та анкета з декількома ми відповідями WKP (А. Матчак та ін., 2006). Опитування респондентів показали, що

використання планшета допомагає засвоювати нову інформацію швидше, а це робить навчання більш цікавим та захоплюючим. Студенти з вищим рівнем дисциплінованості оцінюють аспекти використання планшета, пов'язані з виконанням шкільних обов'язків та навчанням. Кореляцію між академічною успішністю студентів і ступенем екстраверсії можна спостерігати у сферах, де використання планшетів переплетене з соціальною взаємодією. Результати також вказують на можливий зв'язок між сприйняттям використання планшетів і рівнем потреби в стимуляції у робочому / навчальному середовищі.

**Ключові слова:** цифрова освіта, iPads, мобільна освіта, навчання на основі планшетів, технології в дидактиці.