

***Sylvia Galanciak***

Akademia Pedagogiki Specjalnej im. Marii Grzegorzewskiej w Warszawie  
sgalanciak@aps.edu.pl

***Anna Weiss***

Akademia Pedagogiki Specjalnej im. Marii Grzegorzewskiej w Warszawie  
aweiss@aps.edu.pl

***Marek Siwicki***

Akademia Pedagogiki Specjalnej im. Marii Grzegorzewskiej w Warszawie  
msiwicki@aps.edu.pl

## **Mobile devices as support for students with special educational needs**

### **Summary**

The article presents partial results of research conducted among forty eight teachers from four European countries, using tablets to work with students with special educational needs (SEN). The aim of the research was to recognize the scope of application of mobile technologies by teachers and also their opinions on the usefulness of these technologies as support in the process of education and rehabilitation. Despite a small group of respondents, the method of a survey (questionnaire) was used due to the ease of obtaining a precise translation of the questionnaire and the results of the research. The image of teachers emerging from the research is that of pedagogues who realistically assess the advantages and disadvantages of tablets as assisting and training technologies and who try to strengthen the educational opportunities of their pupils without systemic support.

**Słowa kluczowe:** technologie mobilne, specjalne potrzeby edukacyjne, dydaktyka cyfrowa

**Keywords:** mobile technologies, special educational needs, digital didactics

*'Action may not always bring happiness;  
but there is no happiness without action.'*

William James Wahaba (2017: 360)

### **Introduction**

In line with the currently dominant approach to the phenomenon of disability, it is understood not so much as a result of injury, but rather as a result of the barrier that a person encounters in the environment (Cf. World Health Organization 2009, Wapiennik, Piotrowicz 2003: 23).

New technologies support the process of removing these barriers, appearing as both ‘prostheses’ for functions performed by damaged organs, as well as didactic aids, allowing for equal opportunities for students and their proper social functioning (IDEA 2004).

In the context of the paradigm of participation, currently dominant in thinking about the education of students with disabilities, these are invaluable properties. This paradigm assumes authentic, full inclusion of people with disabilities in the community life, not by creating institutional enclaves (special schools, care facilities), but by adapting the environment to their needs (Firkowska-Mankiewicz 2010: 16; Szumski, Firkowska-Mankiewicz 2010: 248–260).

An intuitive interface, a small size and the ease of carrying make tablets and phones a very important, omni-present tool supporting people with SEN in the process of communication with the world: in learning, working or playing. Mobile devices can play a particularly important role in the process of social integration, offering, among other things, numerous accessibility features such as visual impairment aids (VoiceOver – a screen reader, zoom – text enlargement to any size), hearing aids (speech translators), tools facilitating the organization of everyday life, or even virtual assistants of the disabled. That improves the quality of a man’s satisfactory presence in society since it is influenced by “(...) an ever changing, expanding, localized, and personalized cluster of factors that each person must possess in order to function as productively and independently as possible in socially, vocationally, and domestically integrated adult community environments” (Ayres et al. 2008: 260).

The fact that mobile technologies in the role of assistive devices give the possibility of leveling or limiting many deficits is clear and indisputable. However, the extremely dynamic development of digital technologies, especially mobile ones, the wide, constantly changing range of products, puts both researchers and practitioners of special and inclusive education in a difficult situation. On the one hand, they face the possibility of using completely new tools, on the other hand – such quickly evolving tools are not and cannot be thoroughly examined in terms of the physical, psychological, social and cognitive consequences of their application (Galanciak, Siwicki 2017, Bednarek 2010).

This fact raises a legitimate suspicion on the part of some practitioners and researchers (Williams et al., 2006). Combined with the cost of purchasing equipment, this means that devices, despite their huge potential, are used to a relatively small extent at schools for work with students with various disabilities, and teachers interested in them, most often enthusiasts, look for – methodical, and frequently also financial – solutions on their own. This situation is potentially dangerous: at best, the lack of ICT competence may result in not using the tools’ potential, and at worst – in the fact that the use of technology may prove to be counterproductive, making it difficult for the student to achieve the intended goals. However, an assumption should be taken that: “(...) in the absence of conclusive data, educational decisions ought to be based on assumptions which, if incorrect, will have the least dangerous effect on the likelihood that students will be able to function independently as adults” (Ayres et al. 2008: 261).

In other words, every opportunity should be used to optimize the possibility of the student's social functioning in the future, even in a situation of certain (limited) research uncertainty. This is particularly important at the early education stage, because due to the very intensive cognitive and social development of pupils, the resulting deficits can have an indelible mark on the quality of life.

### **Description of research**

Within the framework of the MICOOL Project (International Intercultural Cooperative Learning), researchers from Poland (The Maria Grzegorzewska University, Warsaw), Ireland (Dublin City University, infocus Training Ltd.), Germany (Staatliches Schulamt Lör-rach) and Portugal (Agrupamento de Escolas de Figueiró dos Vinhos) conducted research among teachers using tablets at work with students with SEN (the most numerous group were teachers working with students with intellectual disabilities, but also with students with behavioral disorders, visual impairments or disorders of hearing). The aim of the research was to recognize the scope of application of mobile technologies by teachers of special and inclusive education and their opinion on the usefulness of these technologies as a support in the process of education and rehabilitation. In spite of significant problems with the acquisition of the devices, the teachers' reasons for reaching for the tools were also examined.

For the purposes of the study, forty-eight respondents from the above four countries were able to obtain the survey. The largest group which participated in the survey comprised respondents from Poland (25) and from Germany (14). A number of teachers also completed surveys in Ireland and Portugal. The vast majority of respondents were women (40 out of 48 people surveyed). All graduates of higher education, 80% of the respondents held a master's degree. The majority of respondents were in the 30–49 age group, the oldest respondents from Germany (over 60 years of age). Reaching teachers representing the desired group was extremely difficult due to the lack of systemic solutions in the field of technological support for inclusive and special education in each of the countries studied. Teachers who decide to introduce mobile technologies as an element of work with a student with special educational needs independently look for sources of knowledge, and often also financial resources for equipping their institution. In most cases, the respondents represent a small number of people in the country, enthusiasts of new technologies, devotedly and enthusiastically seeking optimal solutions to support the development of their students.

The method used in the study was a survey. This method was chosen, despite the probability of the small size of the sample, so as to take the advantage of determining the content of the questions precisely (Fox et al. 2003: 167–180; Zaczyński 1995; Pilch, Bauman 2001: 95–97) and obtaining the corresponding translation results of the tool (questionnaire). This was extremely important in this international research, where respondents from several different countries were surveyed (Fox et al. 2003: 167–180). The

resulting questionnaire took into consideration cultural and linguistic differences as well as the diversity of systemic solutions in the countries studied. The research was carried out from March to June 2017. The choice of the group was purposeful, the questionnaire was sent via the Internet only to teachers working on tablets with students with various types of disabilities.

## Findings

The respondents were asked to indicate how often and which digital tools they use when working with students. Among the mentioned devices, the most popular were laptops (41/48 respondents), tablets (35/48) and interactive whiteboards (29/48), both in terms of frequency of device selection and time of use. Smartphones (18/48), video and digital cameras (26/48), as well as specialist assistive technologies (22/48) were less frequently mentioned.

It is worth emphasizing that the vast majority of Polish teachers surveyed use video and digital cameras (19/25) in their work. They do so more willingly than respondents from other countries, which can be a sign of great creativity and commitment of respondents from Poland, trying to make the lessons more attractive, but also taking full advantage of the potential of audiovisual media. On the other hand, the lower interest of teachers from Germany, Ireland and Portugal in photography and film equipment may paradoxically result from the more modern and polyvalent equipment of their institutions. Everything you need to take pictures or assemble a movie with is a tablet equipped with high-quality applications, simpler to use for people with physical or intellectual disabilities than a traditional video camera. Schools that bought equipment a few or a dozen or so years ago, however, have had it until today, so – in the absence of funds to purchase modern mobile electronic devices – it is used by teachers and students.

The surveyed teachers, although they reach for various technological devices in the didactic process, use them with moderation. The answer most often chosen by the respondents is “up to 5 hours a week”, a considerably smaller group uses them longer, and only a few respondents chose the answers meaning more than 10 hours. This means that the surveyed teachers, even if they were great enthusiasts of digitization of education, they treat digital devices with a reasonable distance, as one of many in the repertoire of didactic resources, which should each time be chosen to the intended goal.

In the further part of the research, teachers were asked about these goals – areas of education and upbringing, in which mobile technologies can be a significant support in working with a student with an SEN.

Respondents were asked about the benefits of using tablets in their work. In the case of the statement that mobile technologies enhance interaction between students and between them and the teacher, the vast majority of respondents agreed (43/48 people). Only the respondents from Germany, who were the only ones to point out the answer ‘definitely not’ (5/14) were more distant, in large numbers. It should be noted that they earlier had also declared that they use tablets less than others.

Interesting results were obtained from a comparison of responses between age groups. Noteworthy is the very high percentage of those convinced of the significant integration potential of new technologies among the group of 40 year old respondents (on the 1–6 scale, with 6 meaning “most important”, the average of all responses in this group is 4.83, considerably lowered by two grades 1 from German teachers: half of the 40-year-olds’ answers are 6). The average of responses in the other age groups oscillates around 4, and, what is also worth emphasizing, is the lowest in the group of 30-year-olds (3.9!), while in the oldest groups it reaches the level of 4.2–4.3. Thirty-year-olds, very active in the Internet, are obviously skeptical about the potential of digital media known to them in the area of building and strengthening social relations. With this attitude, the enthusiasm of slightly older colleagues, well remembering the “analogue” school of the 1980s and early 90s, and who can appreciate the qualitative difference that new technologies can create.

80% of the respondents from Poland also agreed with the thesis that mobile technologies increase student autonomy and their independence. Similarly, the vast majority of respondents from Portugal and Ireland agreed with the statement and half of the rather skeptical German teachers. This is one of the questions prompting least controversy among the respondents. Tablets that make it easier for students with disabilities to function in the social environment, communicate and use teaching resources, and improve their physical (e.g. manual, coordinating) activities, according to the respondents significantly increase the independence of their pupils. Also in this case, forty-year-olds participating in the study showed the highest optimism, obtaining the average from the response at a very high level of 5.3, compared to younger (4.8) and older respondents (4.7). It draws attention to the exceptionally high level, compared to other questions about the assessment of the potential of mobile technologies, of high and very high ratings.

Quite similar, albeit less unequivocal, was the distribution of responses to the question as to mobile learning can reduce the impact of students’ disabilities on their ability to perform task. This time also among the Polish respondents appeared those who considered the role of tablets neutral. In the case of the above question again, a group of 40-year-olds turned out to be the most enthusiastic about the potential of mobile devices (the average answer was as high as 5.05). The 50-year-olds (4.9) rated it very similarly. Younger and older respondents showed a greater distance, also presenting a very similar distribution of responses to each other (4.4 and 4.3, respectively).

The respondents’ opinions on the possibility of improving the concentration of the learner on the task by using the mobile device lessons were slightly more diverse. More than half of respondents from Poland, Ireland and Portugal were convinced that such a dependence was taking place (though their opinions were much more moderate – the answer ‘the most important’ was chosen by fewer respondents than in the case of previous questions) and about 1/3 teachers from Germany. Most of them have declared that the level of student concentration does not rise or, rather, does not increase. Similar responses have also emerged among individual respondents from Poland.

One of the most common functions of mobile technologies in special and inclusive education is the use of them, through the appropriate selection of applications, to train social skills and as support in everyday functioning in society. Respondents were asked for an opinion on the effectiveness of mobile devices and applications in supporting the social skills of students with SEN. Over half of the teachers from Poland and Portugal, as well as all Irish people are convinced about the possibilities of mobile technologies in this area. The respondents from Germany, working with tablets far less frequently, show much greater skepticism. They show great care and caution, recalling that mobile devices, just like other didactic aids, should be reached for in a responsible way, with care for the student, remaining faithful to the ancient medical principle: *Primum non nocere* (see Tanaś 2016: 41–54). Several surveys have shown additional comments:

*'I believe that pupils with cognitive needs who already have a better chance of sitting at home at the computer are more in need of educational experiences at school that include sensory and physical impressions, as well as real communication and social interaction, rather than creating even more electronic offerings – even if it also supports social and linguistic development'* (Teacher from Germany 1);

*'I think that it depends largely on the age of students, but also in case of tablets, the rule is that the diversity of methods is important! It's not that tablets are a panacea, and no other method is okay. I would like to use them carefully, taking into account the age, the content of teaching, the level of difficulty...'* (Teacher from Germany 2).

Teachers recognize the necessity of using new technologies with moderation and the need to preserve the diversity of forms of work with the student, especially in the field of shaping social skills – even the best tool cannot replace human contact. With division into age groups, the greater optimism of 40–49 year old teachers was again noticed, although it is also more balanced in this case (average answer 4.4). The surprisingly large skepticism of young teachers (average 3.5), who seem to be disappointed with the world of digital friendships (or just aware of the illusions of its charm), is rather striking.

Respondents (with the exception of Germans, who stay mostly neutral) more positively assessed the role of mobile applications and devices in shaping students' communication skills. This is an extremely important aspect of inclusive and special education: the level of communication skills of people with SEN determines their position in social life. Also in this case, the respondents from the group of 40-year-olds presented the greatest optimism (average answer 4.7). The largest distance this time was demonstrated by the oldest respondents (4.0).

Teachers were also asked about the potential of mobile technologies in supporting the development of students' practical skills. The transfer of virtual training experiences to the real world remains one of the most controversial issues related to the role of ICT in special and inclusive education. For people with SEN (and not only for them) the possibility of using skills acquired in the virtual world in everyday life raises a number of doubts. The

surveyed teachers are also not free from them, with less certainty declaring their belief in the potential of applications and mobile devices in this area.

The potential of mobile devices in the field of supporting the shaping of group work skills was assessed the lowest by the respondents. This result may seem surprising in the context of the fact that in digital didactics this feature of tablets and smartphones is very often emphasized as especially valuable (see Galanciak, Weiss 2016). Tablet, the mobile device, with its ease of transfer, with its content (apps), which can be created or used by several people at the same time and then easily shared by them, is considered an extremely supportive tool for learning to work in a group and creating educational projects. However, among the surveyed teachers, this property was rated quite low (average 4.0), and in case of respondents from Germany it was extremely low (3.1).

One of the reasons for such findings may be specific difficulties that students manifest in undertaking teamwork, resulting from some types of dysfunction (disorders of social development, behavioral disorders, significant intellectual disabilities and others). In the context of the limited training offer on mobile devices, clearly visible in the respondents' statements (not presented in this article), yet another serious conclusion emerges. Profiting from the full potential of mobile tools in group work requires particularly high skills from teachers and they need to be professionally supported here. There is, of course, a group of creative and committed educators who will manage by themselves, seeking information and exchanging experiences on the forums of digital education enthusiasts, but one cannot expect such self-denial from everyone.

## Conclusion

The results of the research are just preliminary recognition of the problem and inspiration to carry more extensive research. However, such small-scale research already shows the situation of teachers using mobile technologies in special education in selected countries to be highly complex. From the answers given, there is a picture of educators looking for solutions on their own, without any systemic support, to strengthen the educational opportunities of their students. They are aware of the extraordinary potential of new technologies, but the technologies are judged in a realistic way. They know what a tablet can do for them in the classroom, but they also know that miracles cannot be expected.

Properly and responsibly used mobile devices and applications can be a great support for the student, both as an assistant, as well as training and creative technology. "Working with the use of iPads has greatly improved the quality of work with students with special educational needs", writes a Polish respondent in a commentary on the survey (Polish Teacher 1). 'I use tablets as often with students who do not have special educational needs' (Polish Teacher 3) – declares another one, working in an integration school, thus emphasizing the universal character and integrative potential of the medium. An important postulate that emerges from the research presented above is therefore to provide systemic

professional support for teachers using ICT in working with students with SENs. The courage of these pedagogues is enormous, but it must not be strained.

Mobile technologies are now an integral part of the world of young people, not parting with their smartphones, tablets or other types of devices constantly connected to the Internet. Access to these technologies and the ability to use them is therefore an important element of the social integration of people with disabilities. A huge number of assistive and training applications created for students with SEN, available on the market (see the catalogue of over 300,000 applications found on the One Place for Special Needs website – [www.oneplaceforspecialneeds.com](http://www.oneplaceforspecialneeds.com)), can play a fundamental role in the process of integration, facilitating or even enabling communication, improving social relations and acquiring knowledge.

There is no doubt that there should be systemic solutions to facilitate the introduction of mobile devices for special and inclusive education. Tablets with large screens and the possibility of installing additional pads supporting manual operation of the device seem in this case a tool with greater potential than more easily available (today almost ubiquitous), but relatively small size smartphones (whose potential is also not used in school, as shown in the Teen 3.0 survey conducted in 2016 by the Polish research institute NASK – see Tanaś et al. 2017: 32).

The proposed solutions must include both the models of providing educational institutions with equipment (taking into account the specificity of the country to which they relate) and more universal patterns (such as the number of school-based tablets, depending on the type of school and the disability of students). They must also offer high-quality support for the development of teachers' competences through the organization of training, workshops and network co-operation.

## References

- Ayres K.M., Mechling L., Sansosti F.J. (2013), *The Use of Mobile Technologies to Assist with Life Skills/Independence of Students with Moderate/Severe Intellectual Disability and/or Autism Spectrum Disorders: Considerations for the Future of School Psychology*. "Psychology in the Schools", 50 (3). DOI: 10.1002/pits.21673, 26.07.2017.
- Bednarek J. (2010), *Teoretyczne i empiryczne aspekty kształcenia osób niepełnosprawnych przez multimedia*. W: Andrzejewska A., Bednarek J. (red.), *Osoby niepełnosprawne a media cyfrowe*. Warszawa, Wydawnictwo APS.
- Bond E. (2014), *Childhood, Mobile Technologies and Everyday Experiences. Changing Technologies = Changing Childhood?* New York: Palgrave Macmillan.
- Douglas K., Wojcik B., & Thompson J.R. (2012), *Is There an App for That?* "Journal of Special Education Technology", 27 (2).
- Firkowska-Mankiewicz A. (2010), *Zmiana paradygmatu w postrzeganiu osoby z niepełnosprawnością intelektualną – od pacjenta do obywatela*. W: Andrzejewska A., Bednarek J. (red.), *Osoby niepełnosprawne a media cyfrowe*. Warszawa, Wydawnictwo APS.

- Fox J., Murray C., Warm A. (2003), *Conducting research using web-based questionnaires: practical, methodological, and ethical considerations*. "International Journal of Social Research Methodology" 6 (2).
- Galanciak S., Siwicki M., Czarkowski J. (2017), *Na krawędzi. Szkoła przed ekranem*. Warszawa, Wydawnictwo APS.
- Galanciak S., Weiss A. (2016), *Nowe technologie w edukacji – między teorią a praktyką pedagogiczną*, W: Tanaś M. (red.), *Nastolatki wobec Internetu*. Warszawa, NASK.
- One Place for Special Needs: [http://www.oneplaceforspecialneeds.com/main/library\\_special\\_needs\\_apps.html](http://www.oneplaceforspecialneeds.com/main/library_special_needs_apps.html), 20.06.2017.
- Pilch T., Bauman T (2001), *Zasady badań pedagogicznych. Strategie ilościowe i jakościowe*. Warszawa, Wydawnictwo Akademickie Żak.
- Szumski G., Firkowska-Mankiewicz A. (2010), *Is Polish Special Education Effective? Academic and Socio-emotional Effects of Schooling in Special, Integrated and Regular Schools*. "The New Educational Review", 1 (20).
- Światowa Organizacja Zdrowia (2009), *Międzynarodowa Klasyfikacja Funkcjonowania Niepełnosprawności i Zdrowia (ICF)*. Warszawa, Centrum Systemów Informacyjnych Ochrony Zdrowia.
- Tanaś M. (2016), *Primum non nocere a internetowa przestrzeń wolności i aktywności nastolatków*, W: Tanaś M. (red.), *Nastolatki wobec Internetu*. Warszawa, NASK.
- Tanaś M., Kamieniecki W., Bochenek M., Lange R. (ed.) (2017), *Raport z badania Nastolatki 3.0*. Warszawa, NASK.
- The United States Department of State (2004), *Individuals with Disabilities Education Improvement Act*. Part B.
- Wahaba O. (2017), *Kindness boomerang. 365 sposobów jak zmienić świat i siebie*. Warszawa, Grupa Wydawnicza Foksal sp. z o.o.
- Wapiennik E., Piotrowicz R. (2003), *Niepełnosprawny w środowisku lokalnym*. Łódź, RCPS.
- Williams P., Jamali H.R., Nicholas D. (2006), *Using ICT with people with special education needs: what the literature tells us*. "Aslib Proceedings", 58 (4), DOI: 10.1108/00012530610687704, 15.07.2017.
- Zaczyński W. (1995), *Praca badawcza nauczyciela*. Warszawa, Wydawnictwa Szkolne i Pedagogiczne.