



Bring your own device or organisation provided device classroom: problematizing the issue of the digital divide in teaching and learning contexts in Poland

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Keywords:

digital divide, OPD model,
BYOD model, formal and
informal learning

Abstract:

This comparative study contributes to new knowledge on how digital inclusion can be supported in two differently designed school settings through the meaningful use of technology to enhance the students' learning and their overall skills development.

This study is a comparative, empirically grounded case research conducted over a one year period in two primary schools in Poland. Our research involved a number of methods, including video-ethnography and interviews, which were used to gather qualitative data from headteachers, teachers, students and parents. The results problematise the issues of the digital divide in teaching and learning practices in both formal and informal contexts. We have checked in what way both OPD and BYOD influence the existing divides in the area of learning processes.

1. Introduction

During the last few years, schools all over the globe have been confronted with challenges coming from the world of modern technologies, which increasingly become tools supporting the process of learning. It would seem that the pressure to introduce modern technologies into school education should be directly proportional to the growing availability of the devices in a given society. However, international research does not directly confirm such a relationship, although it provides good evidence for another process: that of the implementation of modern technologies in developing countries or countries marked by a moderate degree of social and economic development (Pegrum, 2014; Tacchi, Kitner, Crawford, 2012; Zelezny-Green, 2011).

Many educational researchers consider the presence of technologies as an obvious modernisation milestone, which should bring about an improvement in the students' learning outcomes and their acquisition of digital competences (Dingli, Seychel, 2015; Dylak, 2013; Pegrum, 2014; Traxel, 2010). On the other hand, such solutions are criticised for strongly subordinating schools to global capitalism and imposing its standardizing logic to schools through modern tools of education (Nowicki, 2016). The relevant literature fails to be sufficiently clear on whether or not mobile technologies improve the effectiveness of teaching in comparison with the traditional teaching methods (Haßler, Major, Hennessy, 2016). On the other hand, many research works argue that both teachers and students appreciate new technological solutions in education. Teachers indicate that mobile technologies open up new learning opportunities, offering a broad range of new didactic methods, as well as knowledge creation and presentation methods. The results of these studies show that



mobile technologies create new learning opportunities in areas exceeding the traditional model of teacher-led classroom activity (Pegrum, 2014; Culen, Gasparini, 2011). Many researchers argue that the presence of modern technologies at school poses a challenge to the transmission-based frontal teaching model, facilitating an individualized, personalized learning, as well as communication and cooperation between students (Crichton, Pegler, White, 2012; Dylak, 2013; Warschauer, 2011).

During the last decades, the idea of digital justice executed not only as the provision of equal access to ICTs, but also as the bridging of the deeper barriers to access in culture – barriers, which are an important obstacle to an equal digital outcome – has become yet another significant issue. In Poland, the impact of the OPD and BYOD models as alternative roads to equality in the area of the digital outcome has also been discussed. The OPD model is based on the assumption of equal opportunities in the area of access to identical technology by all the students. As a part of the model, it is believed that equality in the area of knowledge and skills takes place owing to the provision of the same sets of devices to the students. However, the OPD does not take into account differences between students resulting from their earlier use of technologies, which may cause a further existence of the inequality of digital outcomes. On the other hand, the BYOD model is based on the technology (varying in quality) owned by the students, which is the reason why it is perceived in Poland as a “weaker model” – one having no emancipatory or inclusive traits, and backing the further existence of digital divides in the society (Dylak, 2013).

This article presents the results of comparative analyses of the OPD and BYOD models conducted on fifth grade students (aged 11-12 years) in two primary schools in Poland. The study was carried out during one school year. We adopted a theoretical framework originating from Pierre Bourdieu’s approach, with its triad of field, dispositions (otherwise referred to as habitus), and practices, which became influential in the sociology of education. The approach enables a multi-layer analysis of educational powers and changes in this scope, if any, affecting the dispositions and practices of the students. We used this approach, treating mobile technologies as a new educational actor, whose appearance in the classroom may initiate a number of changes in the field, dispositions and practices of the students. The theoretical approach used together with a set of research methods enabled us to shed some light on and make a comparison of outcomes of the learning supported by technologies at school, as well as to determine how both models affect informal learning and whether or not (and if so, in what conditions) they have the potential of minimizing the digital divide.

2. Problematising the digital divide: the idea of digital justice

The phenomenon of the digital divide has been exhaustively undertaken in research. Results of the investigations show that the digital divide is a very complex phenomenon (Adhikari, Mathrani, Scogings, 2016; Anderson, 2009; Dijk, 2006; Dewan, Ganley, Kraemer, 2005; Dylak, 2013). Initially, it referred to unequal access to information and communication devices and technologies, resulting from one’s financial status, region of residence (town/village), level of income (high/low), profession, age, or citizenship (less/more industrially developed countries). Currently, along with the heretofore existing socioeconomic understandings of the phenomenon, the sociocultural level in which reasons behind inequality with regard to access to information and communication technologies and their use may be inherent is also taken into account. This does not mean that the question of the financial status of individuals and social groups is irrelevant, in particular in the case of a poorer country such as Poland. However, the research results indicate some reasons inherent in culture, which impair a full participation of individuals and social groups in the digital culture. It is assumed here that the affordability of devices in the society does not translate into the people’s immediate acquisition of dispositions and abilities enabling a meaningful use of the available technologies in the many contexts of activity. Regard must primarily be given to the culture-specific technology structures dominating in a given society, and people’s religious beliefs, which sometimes contribute to an increasing technophobia and a deep fear of technology (Bougsiaa, Cackowska, Kopciwicz, Nowicki, 2016). We need to be aware of gender-related issues and the non-technological mode of the functioning of women in traditional societies marked by a stronger patriarchal culture (such as Central and Eastern Europe). The traditional belief that women do not understand or like technology and cannot use it correctly is reflected in the practice of Polish primary schools, where along with the obligatory elementary IT course, students are offered facultative ICT clubs (coding, robotics, and design of websites, games, and apps) which are joined almost solely by boys. The degree of the



self-elimination of girls from the domain of technology is visible already at the stage of early education, and teachers and parents fail to perceive any dangers in the process (Bougsiaa, Cackowska, Kopciwicz 2013).

The effects of “gender and technology” are very important in view of the almost total female monopolisation of the domain of school, including developmental psychology and early education, where extremely conservative discourses announcing the harmfulness of technology in the education of children and a return to naturalistic developmental discourses are generated. Here, technology is constructed as an artificial power disturbing the natural development of the children, killing their cognitive abilities, and impairing their moral development (Gruszczyk-Kolczyńska, 2013).

We should also be aware of the presence of information and communication technologies in the life of the young people and their use of technology for entertainment and their life-style area (Hjorth, Burgess, Richardson, 2012). In societies, such particularistic practices of the use of technology by the youth reach the status of obviousness, which fits the social stereotype that modern technology is not connected with the lifestyle of mature or older individuals and that they need technology only to a minimal degree. However, technological practices in the area of entertainment and lifestyle are not the only possible or appropriate social activities existing around technology.

The sociocultural aspects of the digital divide created an important background for the discussion of the digital inequality question at the third level: that of the digital outcome. Digital outcome divide is defined as an inequality of the outcomes obtained by ICT users, which are based on individual attitudes, technology-related motivations, differences in the quality and nature of the use of technology, and the giving of meaning to it (Adhikari, Mathrani, Scogings, 2016). What is also significant in this context is how these types of divide are developed educationally.

In order to meet the need to minimise inequality related to the digital divide in its complex meanings, the idea of technological justice, understood as an equal access to ICT devices, specialist support, and the achievement of valuable learning outcomes with the help of digital tools, has sprung up. Initially, technological justice was to be best supported by the so-called OPD (organisation provided devices) model. The gist of the model lies in public educational institutions providing the students with the same technical equipment (a set of tools), software and support from teachers during classes. This top-down approach normally involves the provision of a base for equal opportunities in the learning process. It subordinates the technology to, and implements it in, the existing educational culture, teaching and learning practices. What dominates in this model is the assumption that students should be taught the appropriate, educational use of quality advanced technology, which will then be reproduced in their everyday life practices. Under this model, educational institutions are responsible for the quality of the digital participation of children and youth, and that quality use of technology is promoted and stimulated (Dylak, 2013).

In view of the current rapid transformation of the technological landscape, and the dynamically growing affordability of technologies in individual households, some researchers conclude that progress in digital literacy takes place in daily life, while the digital divide and its negative consequences have been almost entirely eliminated in the richer societies. As much as the latter conclusion seems to be excessively optimistic, people began to recognise that the situation in which the student enters school with his/her own technology, preferences, abilities, habits, and ICT-related knowledge can be more valuable from the educational point of view and better for the development of digital competences and fuller participation in culture. It is a starting point for the educational efforts of the school in the area of the deepening and developing of individual abilities and knowledge acquisition. Usually, this model is implemented in schools as a bottom-up approach, as technological inequalities and differences in abilities are considered to be an educational challenge and an opportunity to learn collectively in the naturally-shaped environment as well as to overcome the real barriers encountered in everyday situations and uses of technology (Dylak, 2013; Pegrum, 2014).

Both the OPD and the BYOD models are attempts at coping with the increasingly dynamic, personalised, flexible, and mobile learning environment in which the idea of digital justice becomes more and more complex.



3. Research design

One may refer to a variety of research methods to conduct a comparative study of the OPD and the BYOD models: their implementation in the classroom, a comparison of the outcomes of mobile technology-mediated learning, and the tracing of micropolitics in the area of technological justice. We selected a qualitative approach inspired by social constructivism: two case studies, which showed an in-depth view of the phenomena under study in natural contexts. We avoided research approaches based solely on declarations, containing no external look at the phenomena under study. We also rejected an experimental approach, which – although providing hard data – failed to provide access to contextual data and the perspective of the subjects participating in the everyday life under analysis (Pegrum, 2014). We have combined elements of explorative, explanatory, and descriptive approaches (Derry et al, 2010), which are important from the point of view of an in-depth insight into the gist of the phenomena in the educational culture in Poland. Our main research approach was video-ethnography: the recording of the course of school classes during which technologies were used, which was supplemented with a variety of other narrative data collection methods: interviews with teachers, headteachers, and parents, as well as interviews with students. Our study is an in-depth comparative case study with continuous investigation carried out at weekly intervals in the course of a single school year. This study represents educational initiatives which are relatively new in the context of Poland.

4. Theoretical framework: field, dispositions (habitus), practices

From the point of view of the goals of our study that are focused on learning, we could assume, following Pachler, that a good analytical framework would be based on structure/culture-specific practices/agency. Many researchers adopt such a framework, indicating that it is appropriate for analysing mobile technology-mediated learning, which takes place around and through these three domains (Pachler et al, 2010). Nevertheless, we feel that the framework determined by sociologists of education is more appropriate since our starting point is based on the sociological assumption of change taking place at school, in learning dispositions and in practices as a result of the appearance of mobile technologies – a new actor in the school arena. Therefore, we were interested in particular in the process of the school-based “processing” of technology and giving the technology a specific meaning from the point of view of the school’s interests, needs, and views. We also intended to check in what way the said school-based “processing” of technology affects the already developed learning dispositions in the students’ daily life. It was for this reason that we selected the theoretical framework determined by Pierre Bourdieu’s approach, which facilitated an analysis of both the way the school copes with the technology on its own grounds (how it processes it for its own purposes), and in what way such a relationship changes the previous ways in which technology was used by students in their daily life (Bourdieu, 2000).

In Bourdieu’s social theory, the field is defined as a fragment of the social space, which is guided by its own logics (order). The functioning of the individual in this field is connected with a socialising activity (both the open and the concealed transmission and acquisition of the socialising message); through its numerous structural compulsions, pedagogical actions, and ideologies, the field produces in individuals some relatively constant dispositions to act. For the transmitting and the acquiring individuals, the very presence in the field is therefore tantamount to the necessity to use a specific code of conduct in which a range of compulsions, possibilities, and limitations imposed on the activity can be noticed. The field can also be defined as a system of social powers and meanings, which – mutually strengthening each other – create the area of “obviousness” (i.e. practical knowledge and rules of conduct, and therefore whatever is believed to be natural, obvious, habitual, known by everyone, requiring no deeper thinking) in the field (Bourdieu, 2000).

A range of relatively constant individual dispositions to act is developed owing to the powers acting in the field. Such dispositions are flexibly adjusted to the conditions, possibilities, compulsions, and boundaries existing within the field. The dispositions are developed in such a way that an individual can effectively act in the given field, and such that his/her actions have a chance to be effectively carried out, are legitimate, and kept within the limitations determined. From the social point of view, an analysis of the learning dispositions developed at school is significant since it shows in which areas the school develops the sense of empowerment and practical masterfulness in the students, and in which both the empowerment and the practical



masterfulness are not developed or are extinguished. From the point of view of our interest in the transformative technology-mediated learning, it is the key finding of our study.

Practices are defined as an observable repertoire of relatively spontaneous actions of the students, in which the training of the dispositions desired by the school or the symptoms of the already developed dispositions (depending on the context in which such action takes place) can be observed (Bourdieu, 1990). What should be underlined here is the fact that the repertoire of practices in the school field is always exceptionally rich, varied, and often steps beyond the expectations of the school. Nevertheless, in this context we also need to see the teachers' actions aimed at the preservation of certain types of practices of the students, and the extinguishing of such actions, which seems to be contrary to the logic of the school field. Our study refers both to the observable practices of the students and the teachers' actions, which strengthen such practices, treat them in a neutral way, or extinguish them.

5. Research Questions

Taking into account the theoretical framework of our study and its comparative nature, we developed five research questions relating to three levels: the field (changes in the structure), the habitus (changes in the learning dispositions), and the observable practices. Our analysis aimed at the identification of data concerning the indicated dimensions resulting from video data, and interviews with headteachers, teachers, parents, and students. We used the triangulation of the research methods postulated in the qualitative approach, i.e. a look at the given research question taking into account the various types of empirical data. Such a strategy considerably deepens the insight into the phenomena under study, makes it possible to show them in a broader context, and strengthens the reliability of the obtained results (Pegrum, 2014). We used the following research questions:

- In what way do the OPD and the BYOD change the understanding of the school pedagogy and philosophy of education?
- What impact do the OPD and the BYOD models have on teaching practices?
- What concepts of digital justice are implemented in the OPD and the BYOD models in the schools under analysis?
- What changes in the learning dispositions of students are observed by teachers, the students themselves, and their parents?
- What changes in the learning practices can be observed in classes with the OPD and the BYOD models?

6. Data and Methods

Our source data included video recordings made at weekly intervals – about 50 hours of classroom activity were recorded in both schools. The collection of video data required a special ethical clause and a unanimous consent of the entire school community and parents for cameras to be used during lessons.

Another source of data was the use of semi-structured interviews with 20 parents, 10 teachers, and teams composed of 4 school heads. Interviews were also made with 45 fifth-grade students from both schools. Participation in research was voluntary and anonymous.

As a result of the research process, we obtained a very rich collection of material in the form of films and narrative data. Research material originating from schools was analysed separately. After many readings of transcribed interviews, and watching video material, we started to identify the dominating educational practices, repeated behaviours and typical activities, evaluations formed by the subjects, and the changes and difficulties they noticed. At this stage, we conducted a thematic analysis, i.e. qualitative coding, which was the first step to a more in-depth data interpretation. The code analysis allowed us to create maps of the school pedagogy, learning dispositions, and learning practices. We then compared results from both schools, and developed a report on similarities and differences concerning the ODP and the BYOD models in relation to the research questions. The identified constructs from the narrative and the video data were referred to the theoretical framework, where the individual levels created units of analysis.



7. Findings: OPD and BYOD models

We selected Atlas ti¹ for the coding of narrative material. As a result of the procedure, we identified some leading topics – ideas which were repeated in the research material. The topics were then categorised into the appropriate “locations” in the theoretical framework we had adopted. The video material was used for the identification of typical activities in the classroom, teaching and learning practices, the most frequently used forms of work, etc.. A comparative analysis of the video material from both schools made it possible for us to develop a report on similarities and differences in the area of the three dimensions under analysis. Table 1 shows the distribution of qualitative codes between the OPD and the BYOD models.

Table 1. Distribution of qualitative codes between OPD and BYOD models

Unit of analysis	Aspect	OPD model	BYOD model
School field	Dominating philosophy of education (before the implementation of technology)	Transmission of knowledge Teacher responsible for the students' learning Teachers control the learning process Textbook as the main source of knowledge Frontal teaching Domination of individual work Occasional work in pairs or groups	
	Role of technology at school (expectations)	Make your teaching more attractive, Incentive to learn, Increased motivation, Improved learning outcomes, No verbalised expectations concerning the very digital literacy or other digital learning outcome.	Act in line with the natural manner of cognition of the digital natives generation, Teach educational use of mobile technologies, Limit thoughtless use of technology purely for entertainment.
	Changes to the philosophy of education in connection with technology	Minimum, Domination of the transmission-based model of teaching, Individual work in the one-to-one model Technology subordinated to dominant pedagogy.	More extensive ones, Transmission-based model is balanced with problem-based learning, Group work Technology introduces new pedagogies.
Habitus-learning dispositions	Formal learning	Division of technology into a school-related one (learning) and other (fun).	The already possessed abilities are an important part of group learning, Awareness of limitations of technology and individual learning blockages.
	Informal learning	No impact. Technology is attractive – outside school, it is used for fun and entertainment (learning takes place at school, fun takes place at home).	The existence of impact. The discovery of the significance of collective action on the basis of shared technologies (significance of networks, relationships), Discovery of new learning areas and approaches (game-based learning, AR, interactive books).

¹ Software for qualitative data analysis.



Unit of analysis	Aspect	OPD model	BYOD model
Practices	Initiated by teacher	Use of applications – tasks based on repetitions and time-based exercises.	Creation of one's own content – video, audio, photographs. Team work – encouragement to search for applications independently.
	Initiated by students	Independent search for and installation of applications, Group work and sharing, Photography and film-making.	Use of social media during classes, Sending content (photographs, videos unrelated to lesson topic).
	Teacher-enhanced activities	Exercises from the recommended applications – done independently and repeated many times.	Independent selection of applications, Discussing the usefulness of applications, Creative presentations using audio and video materials.
	Teacher-extinguished activities	Ban on playing games, taking selfies, and recording videos.	Infringement of discipline – attempts at using banned websites, Attempts at using social media.

The manner of the introduction of both the OPD and the BYOD models is connected with some basic differences concerning the three selected levels: the school structure and pedagogy, dispositions, and learning practices. However, notably, these differences are in no way connected with the very technology, while clearly being related to social relationships around the technology – they are designed by teachers (and school head teachers) both in the domain of the meanings (defining what technology is in the educational field, and what its place, role, and tasks are) as well as practical solutions in the area of the manner of using technology during individual classes. We should add here that teachers in Poland do not have very advanced skills in the area of using technology during work in the classroom, and many of them believe that a school without technology would be a much better place. Additionally, the Polish system of education continues to be dominated by a transmission-based orientation and frontal teaching with a small component in the form of activating teaching methods, project-based methods, and problem-based learning (Klus-Stańska, 2010). 60% of teachers in Poland still consider the transmission-based orientation as the best and the most effective approach to teaching at school (Klus-Stańska, 2011).

7.1. School field, technology, and digital literacy

In the first school participating in the study, technology implemented as the OPD model (iPads) was clearly to fit in with the logic of transmission. According to the heads and the teachers, technology is only to make the transmitted content more attractive and more modern – not to change or disrupt anything. As technology is associated with the discourse of progress, both the parents of the students and the school heads expected a considerable improvement in learning outcomes – which did not take place:

“We are a little disappointed, because the children do not learn any better. Obviously, classes with iPads are much more attractive to them, which no doubt translates into involvement. This is better than the dry lessons, which were often boring. But only as much as that” (P)²;

“We assumed that an improvement of the learning outcomes would take place as a result, in particular in the case of the weakest students, but, unfortunately, this has not been so. Maybe we are to blame, as not all of us feel confident in this area, and our expectations were very high. Perhaps it was simply too much for us, although, speaking from the perspective of the year of facing the iPad challenge, I would not have changed my decision” (HT).

² Said by: P – Parent, H – Headteacher, T – Teacher, S – Student.



Without any doubt, the group of teachers and heads of the school did not define the presence of the mobile technologies in the context of the digital literacy or teaching new useful digital skills to children. Teachers “reduced” technology in a peculiar way, and subordinated it entirely to the school and transmission-based teaching: the video materials did not show many alternative or innovative teaching practices involving iPads. This model of the approval of technology at school does not extend beyond the substitution of the traditional tool with the modern one – there has been no change in the function or environment. For this reason, teachers and heads alike are confused by the question of whether or not they aimed at the improvement in digital literacy:

“I must admit that we did not. The use of iPads is so intuitive that children do not need to be taught anything additionally. We only want to teach them in a more interesting and more modern way” (T);

“I must say that these children win hands down with us in using the devices and we have simply nothing to do here” (T).

The teachers participating in the study do/did not assume that the use of ICT equipment automatically generates digital literacy, but – as they say – they are not interested in this competency in the perspective of their didactic work. It is because here, technology aims solely at making classes more attractive, increasing the students’ involvement in classroom activity, and the other effects, if any, are generated without the participation of teachers. Such a limited understanding of the role of technology very strongly permeates into the area of teaching practices, which continues to be dominated by the transmission-based model and encouraging students to individually repeat the content in a series of repetitions (which makes the model very similar to a factory model).

In the case of the school in question, knowledge still functioned in the form of facts, which must be transmitted by the teacher and memorized by the student; the appearance of tablets was not related to any attempt at a redefinition of knowledge. Tablet-mediated learning is subordinated to the model of learning based on the memorisation, revision, and storage of the content in the student’s mind. In this sense, the OPD model adopted by the school consolidates the existing school pedagogy, instead of reconstructing it. Technology broadens and strengthens the teacher’s control of the student’s knowledge. It becomes the teachers’ tool used for content memorization, and its attractiveness is used to foster the students’ involvement. However, it is not a model which introduces any meaningful educational change.

In the second school, the question of the integration of technology with the school pedagogy looked slightly different. There, the introduction of the BYOD model was based on the reasons inherent in the theory of pedagogy. The model was not implemented as a top-down project in the entire school, but was introduced as a small bottom-up initiative of a few teachers assuming that students – users of modern technologies – use another cognitive style, are multi-taskers, use many sources of knowledge, and their socialisation includes a considerable amount of digital literacy. On the other hand, the teachers were disturbed by the fact that students used the devices almost solely for fun and entertainment and failed to be able to use them for learning-related purposes. Initially, the project was to be implemented on a one-to-one basis, but the devices of some of the students could not be used at school due to their operating system. The assumptions of the project were changed for the benefit of work in small groups having at least three smartphones (mostly with the Android system; two groups had devices with the iOS system). This solution led to some cracks in the dominating transmission-based teaching model, allowing the alternative problem-based learning and the project-based method. According to teachers and the heads, the BOYD model has considerably activated the students, who are now more involved and have a better motivation to learn, although no significant improvement in the learning outcomes has been recorded:

“Technology was not to be used for school, but for children. And we wanted them to start thinking about how to learn, not to have better grades” (HT);

“What is a strong point of this project is that it teaches children a wise attitude to technology as a powerful learning tool. I aimed at showing them how to learn using powerful tools, rather than how to get the best grades. I find it most important” (T).



According to parents, school has an impact on how children use mobile technologies, and owing to this, parents are more confident that their child uses technology in a correct manner:

“I was always worried by how long children play a silly game, and that it is so hard to stop them. Now, my son can use his smartphone not only at school, but also at home – he learns, searches for knowledge, repeats vocabulary, does exercises. And he enjoys it” (P).

The adopted BYOD model serves traditional goals (it strengthens the transmission of knowledge and its memorisation), while reconstructing the school-based understanding of knowledge towards constructivism (as it is based on students’ strategies, their personal knowledge, group work, and knowledge verification) and connectivism, which acknowledges the dispersed nature of the dynamically developing knowledge existing in social networks. In this sense, the BYOD model serves student-centred strategies and the reconstruction of the role of the teacher – from that of a lecturer of knowledge towards initiation, guidance, and support in how to learn in groups and social networks, how to jointly solve problems, and how to verify sources of knowledge.

7.2. Dispositions to learn and digital justice

Every technological initiative in the schools participating in the study is grounded in a certain concept of digital justice. Naturally, the idea is understood and executed in a totally different way in each of the facilities. In the first one, digital justice boils down to the provision of the same set of costly devices to be used during classes to all the students. However, what is strongly disadvantageous is the manner in which technology is used at school, i.e. its subordination to the transmission-based order of the school. Students conclude that technology is attractive, but does not serve transformative learning. Therefore, school offers the “wow” effect to them, but fails to step beyond such an effect. The belief that technology is attractive also stems from its connection with the world outside the school – entertainment, pleasure, free time, music, games, hobbies, etc. The application of the OPD model at school uses this off-school structure to make the normally boring school message, the repetition of knowledge and memorization of material more attractive. Unfortunately, in view of the way in which technology is used at school, students’ dispositions are not reconstructed in the long term. What actually happens is the deepening of the existing divides: the existence of school tasks to be served by technology, and the existence of off-school, entertainment-related goals to be achieved by means of private devices. What is worse, as expressed by the students themselves, they are very careful that their devices do not get “contaminated” by the applications used at school:

“I’m not going to install any school app voluntarily. Trust me!” (S);

“My iPad serves only non-educational goals. We have education at school” (S);

“I do not contaminate my smartphone with the apps which I have at school” (S).

Analysis of the empirical material shows that school not only has the power to strongly divide the activities of students into school-based and off-school ones, but also introduces a very strong division in the area of technology and its potential uses. Unfortunately, school action related to technology turns out to be blocking. We are dealing with a very limited development of new learning dispositions and superficially understood justice – equal access to the same set of devices.

Things look different in the case of the BOYD model, where the activity of the school is not only based on the private devices of the students used for school-related purposes, but also on the abilities students already have. The establishment of a learning community – children who share their knowledge and skills – is the ground for the development of digital justice taking into account differences in the knowledge and resources people have at their disposal. Solidarity and a learning community do not guarantee the achievement of equal outcomes, but they offer a certain added value resulting from the synergy typical for group processes. Aiming at the maintenance of balance in the group, assistance and support, and the ability to share resources, also proved to be conducive to the acquisition of new learning dispositions. These include a belief in the significance of connectivity for problem-solving, a critical verification of sources of knowledge, the search for inspirations in other areas of activity and their creative introduction to the students own ones, the importance of expression and creativeness, increased focus on the shared content, and on not sending it to others without



checking. Learning at school to a certain degree affects learning in informal contexts by adding value to such activities as communal or individual learning through games, interactive books (and applications for independent book creation), applications for digital storytelling, applications with extended reality, etc.:

“I used to have only one type of games in my phone. I learnt at school that there are also other applications and that they help me learn. Now I can do many things on my own. I do not have to use the ready application teaching [English] words, but I can do something myself, for example a book with photos and words. I now also have many more books in English, and in the past I did not have any at all” (S).

The students participating in the study indicated that they learnt to use their smartphones more comprehensively, and that a much better balance between their uses of technology for fun and learning has taken place. The balance takes place owing to the bold and decisive entry of the school into the communication channels so far reserved for children and youth (e.g. Snapchat was used for off-school tasks, etc.):

“Our teacher often arranges homework on Snapchat. We then have to speak or write on a given subject in English. This is cool, all my classmates like it, although this is a normal graded homework. We often organize such tasks for ourselves independently” (S).

However, although in comparison with the OPD model the BYOD model is more problematic and poses a greater technical challenge, it has one very important advantage in the context of the Polish school: it breaks the barrier of the “legality” of technology. It turns out that students can not only bring their tablets or smartphones to school, but that they can also use them as fully-fledged learning tools defined in a positive and productive context.

7.3. Teaching and learning practices and the learning outcomes

An analysis of the empirical material, in particular videos, allowed us to identify repeated practices – both those initiated by the teachers and bottom-up ones. They also differ depending on the analysed model of the integration of technology in the schools participating in the study.

7.3.1. Teaching practices

The teaching practices in both schools under study are consistent with the educational philosophy the facilities follow. In the OPD model, apart from the traditional knowledge-providing methods, there are also introductions to exercises and tutorials. Other significant parts of the teaching include the organization of competitions between students, the establishment of a hierarchy, the grading of individual outcomes, and announcing the winners. The teachers are very careful not to allow elements typical for the daily activity of the students to enter their teaching practices, and for this reason their selection of applications (they are selected solely by teachers) does not take into account almost any games (they are used extremely rarely), or video- or camera-related options. Teachers use tablets to check the students’ skills in the area of mathematics or foreign languages or to test their knowledge through quizzes. The Safari browser is used to search for information, although the activity is undertaken marginally. The teachers also use presentations, which are sent to the students’ tablets (and displayed on a whiteboard) as a model for the individual presentations to be prepared by the students.

In the case of the BYOD model, group work is used due to the number of the devices available. Teaching practices include the instruction and demonstration of solutions. Teachers use game-based learning, digital storytelling, and presentations with audio and video features. They allow the students to choose applications to a much larger degree, although the teachers do check their usefulness. They also frequently use quizzes in their teaching, with the option of discussion and the collection of information through surveys. Teachers encourage students to perform WebQuest, searches for educational materials on YouTube, etc. What poses a considerable challenge is the possibility to present the students’ works to the class and to archive them. The team of teachers developed, however, a cohesive approach to such questions. Teaching practices are not limited to the school space, but also include homework-related contact between teachers and students through social media (such as Snapchat).



7.3.2. Learning practices

We can say about a large part of the observed learning practices that they are communal regardless of the analysed technology model. Nevertheless, the school makes different uses of these practices. In one context, they can be considered as desired ones and be supported, while being treated in the categories of a resistance to school and insubordination in the other.

Under the OPD model, children most often had to work individually, independently (20 times), and group work was initiated rarely (5 times). In this case, the cooperation between children was temporary and was called for as an intervention measure – when children had a problem with the use of the equipment or applications, the teacher asked others to help. The domination of such solutions was connected with the economic treatment of time – to use the best possible outcome as fast as possible. Under such an approach, group work is perceived as a non-productive waste of time. The activity model used most frequently was the work of the entire class on the basis of a single application selected by the teacher. Interestingly, when the children tried to show the results of their efforts to their schoolmates sitting close to them, the teacher stopped them from doing so. For this reason, the children tried to circumvent the restrictions, using technology to develop the area of alternative, communal, and concealed activities (e.g. when wanting to share an idea, they made a screenshot and sent the pictures through Airdrop). In this context, communality and technological invention seem to be “side effects” of the student’s culture of opposition. Similarly, i.e. in a covert and communal manner, the young students used the camera – both for taking photos and videos (the teachers did not use the devices for these purposes at all). The teachers condemned such activities very strongly as abuse and disobedience.

In the case of the BYOD model, some other practices were observed. The deficit of the available technology in a way enforced the school to follow the group work model. However, for the teachers this model became an opportunity to try a different teaching strategy, which was also related to different learning strategies on the part of the students. The group work initiated by teachers, which was supported at each stage of the project’s execution, became an opportunity for students to acquire an in-depth knowledge, which often stepped beyond the standards included in the curriculum. An analysis of the learning practices shows that the teachers gradually released in the students the responsibility for learning and the outcomes of the process, the will to undertake a risk to do with learning by testing various ways of achieving the intended goals, encouraging the children to select sources of knowledge independently, to think critically and to negotiate their work outcomes. Some other integral elements of the processes included trusting that the students are able to handle their learning-related issues themselves, respecting their application-related choices, aesthetic preferences, and selection of games, and allowing them to commit mistakes. The students often used the camera/video functions in their devices and digital storytelling applications. There is no doubt that the teachers managed to maximise the students’ involvement in the work during classes, although this does not mean that they also managed to minimize their resistance. Owing to the discovery that the Internet plays such a significant role in modern learning, any slowdown or other connectivity-related problems became a pretext for an immediate discontinuation of a given activity. Some other adverse reactions, which were recorded quite often, included the students’ escapes to social media or their favourite games, which they wanted to share with their schoolmates. These symptoms of independent student activity were unavoidable from the perspective of a lowered teacher control. They were also sometimes connected with unsolved tensions and conflicts in the groups, which affected the quality of the children’s involvement.

8. Conclusions

This text aims at problematizing the digital divide issue and the idea of digital justice on the basis of a comparative study of the OPD and the BYOD models in Polish schools. The adopted theoretical perspective originating from the sociology of education allowed a critical insight into three aspects: the school field, learning dispositions, and practices. The adopted theoretical framework made it possible for us to connect the particular types of pedagogy, the manners in which teachers understand the role of technology, the learning dispositions assumed and the learning practices designed by them, as well as practices undertaken by the students.



A comparison of both models of the integration of technology into the school curriculum shows that it is the degree of changes in the area of school pedagogy which is the source of new learning dispositions and practices. Technological order does not automatically result in any emancipatory or conservative learning practices. A comparison of the functioning of both the studied technological initiatives in schools shows that it is the way in which the role and the function of technology at school are defined which is of key importance. When answering the question what technology is to serve at school, we noticed a model of a superficial understanding of technology as fashionable gadgets, which are to make school more attractive and make the heretofore existing way in which the school worked trendier in the eyes of both the students and their parents. A subordination of technology to the functioning pedagogy is observed both at the conceptual level, as an absence of interest in the question of digital literacy, and at the practical level, where school activities involving technology are to fit in with the traditional school activities in which technology was not used. Hence the teachers' preference for the use of tablets in the individual work of the students and the rejection of the group work model. In the analysed OPD model, the school did not intend to have any impact on informal learning practices. Additionally, it strengthened the students' belief that there the use of technology is strongly divided into a serious use at school, and a fun use at home, which led to the children rejecting the educational use of their private tablets or smartphones. The division was caused by a specific selection of applications and tasks, which were not to be similar to the children's previous uses of technology. In turn, the idea of digital justice is understood very simply as the school's obligation to provide the same set of devices to the students. And this is where the school's obligations basically end. The school is not interested in the building or the measuring of digital literacy. The team of teachers assumed that children were more competent than they were in the area of the use of the devices, which most probably means that this factor is the measure of their digital literacy.

On the other hand, in the second school we observed the BYOD model, which originated from the belief that the youngest generation of mobile technology users have a different cognitive style. This belief became the starting point for the introduction of the students' devices as well as their skills and preferences in the area of the digital culture into the school space. On this basis, the teachers intended to reconstruct both the learning dispositions and the practices in order to give them a more educational flavour. The efforts aimed at an increase in digital literacy result from a changed understanding of knowledge – perceived as dispersed and existing in social networks. The idea of digital justice was understood here as the broadening and strengthening of the quality of the children's digital participation, the development of their competences and the awareness of the role of technology in their learning. The starting point for this project was a change of the form of work during classes from a transmission one to problem-solving and a reconstruction of the role of the teacher.

In the analysed models of technology implementation, we considered the understanding of the role of technology by teachers, which determines and designs its acceptable uses in the classroom by students, as the key factor. Understanding in what way technology could change teaching techniques and the assessment whether or not such a change would make sense and be desirable is another significant factor.

What is noteworthy, in both models under analysis we observed an increased involvement of the students in the classroom activity and the performance of school tasks. However, we need to remember that such practices can be based on different grounds: they may be an expression of the execution of a student-focused learning strategy or be an escape from the school boredom. It is for this reason that they may lead to other dispositions and learning outcomes: in one case to digital literacy and a deep reconstruction of learning dispositions also in informal contexts, while only to the “wow” effect, without causing significant transformations in the area of dispositions, in the other.

An analysis of the empirical material allows us to arrive at the following, rather paradoxical, conclusion: a comfortable situation in the form of an investment into modern technologies for every student does not have to lead to the bridging of digital divides, and may strengthen the existing divides and unfavourable dispositions. Access does not necessarily lead to the appearance of dispositions or practices, digital literacy, or valuable participation in the digital culture. Pedagogy is more important than technology.

Our study has revealed several problems, which deserve a more in-depth investigation. When analysing the digital outcome, it would be valuable to have a much closer look at the area of the concealed practices initiated by the students against the school, in connection with the fact that sometimes students are better users of digital tools than the teachers or that they use intuitively unknown functions of the devices. Therefore, it would be worthwhile to have a look at the contexts of the students' technology-supported resistance as well



as their educational consequences. It would also be valuable to trace gender-related issues in the models of technology implementation at schools, taking into account both female teachers and students.

One of the greatest challenges faced by Polish schools implementing modern technologies is to acknowledge their communication-related nature, which is tantamount to the granting of more freedom and independence to the students in the development of their own learning on the one hand, and to a more significant exposure of the students to the contact with the controversial content available on the Internet at school on the other. The antinomies of freedom and safety must be carefully analysed so that the possibility of learning in the digital culture is not paralysed. Our study results from a small-scale research, and that is why it would be difficult to extrapolate its findings to other learning communities. However, as a qualitative study, it sheds some light on the mixture of pedagogical, culture-specific and technological factors shaping the modern learning and its diverse results.

Acknowledgement

This text and the research it discusses have been financed with funds from the National Science Centre, Poland, as a part of the research project 2015/19/B/HS6/02218 “Learning enhanced with mobile technologies in Pomeranian schools. Critical questions about the development of “21st century skills” and gender inclusiveness in school models BYOD/BYOT and OPD”.

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