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DIGITAL TECHNOLOGIES AND EDUCATIONAL INEQUALITIES IN
SECONDARY SCHOOLS IN BULGARIA

ABSTRACT

of a dissertation

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The thesis has been discussed and admitted to public defense at a meeting of the Sociology Department at the Faculty of Philosophy at Sofia University “St. Kliment Ohridski”, Sofia, held on 19.06.2024.

The structure of the thesis includes the following parts: Introduction, Three chapters, Conclusion, Bibliography, Appendices (three). The total volume of the thesis (without the appendices, which are 20 pages) is 190 pages, including 5 graphs, 6 figures and 1 table.

The bibliography contains 161 sources, out of which 59 in Cyrillic and 102 in Latin.

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Introduction

Problem statement

Taken separately, the topics of the role of social inequalities in education and information and communication technologies (ICT) in the educational process are not new in research. The social problem of educational inequalities is a key problem in the sociology of education. However, linking the role of ICT to the impact of social inequalities in education is a systematically unexplored issue (Lonka, 2015). These problems have become particularly relevant in view of the global pandemic of Covid-19 and the need to adapt education to the changing situation and the widespread use of alternative forms of learning such as distance learning and electronic learning.

Digital technologies create new opportunities for organization and implementation of the educational process and significantly change the educational environment. However, the possibility of participation in distance learning and use of digital technologies depends on a number of objective factors such as access to the Internet, availability of electronic devices and educational resources, and also on subjective factors such as attitude to education in the family and social environment and possession of digital competences.

Therefore, it is essential how the role of digital technologies in education is understood and realized, how social inequalities between students affect the impact of ICT in education and how ICT should be integrated and used with a view to reducing and overcoming, and not reproducing the existing social inequalities and transforming them into educational ones.

Research goal, tasks, hypotheses

An extremely important *research problem* is not just the impact of ICT on the learning process, but the way in which access, usage and benefits of using digital technologies in the educational process are realized for students coming from families with different social status.

The main aim of the thesis is to analyse how, in the context of different social inequalities between students' families, ICT (through the example of electronic diaries) are being included and influence the educational process and whether they can lead to the inclusion/exclusion of certain social groups or individuals from education. *The subject of research* is the impact of ICT (electronic diaries) on the access to education, communication

and control in the educational process, the level of participation of various social actors in it, as well as the emergence of new "digital" inequalities. *The object of research* is the education system, specifically students, teachers and principals in secondary schools in the country.

The PhD thesis seeks to answer the following *main research questions*:

1. What is the role of digital technologies in education and to what extent are they able to transform the educational process into a network of human and "non-human" actors, the interactions between which significantly influence its implementation?
2. How does the presence of social inequalities between students affect the way of integration and the role of digital technologies in education?
3. How does the integration of ICT in education affect access to education, control in the educational process, communication between different actors and their engagement with education?
4. Are new "digital inequalities" created as a result of the integration of ICT in the educational process and how does this change the power relations in it?

The purpose and research questions of the thesis require solving a series of *tasks*:

- To understand at a theoretical level the transformation of digital technologies into a key factor in the educational process.
- To conceptualize the relationship between digital technologies and social and educational inequalities.
- To identify inequalities in access, use and outcomes of ICT use related to differences in students' social status.
- To research how inequalities between students related to differences in the social status of their families affect: a) access to education, b) control over students by parents and teachers, c) communication between teachers, parents, students and principals.
- To analyse whether and, if so, what are the new functions of ICT and more specifically - do electronic diaries have new functions compared to their paper version?
- To analyse basic policies regarding the introduction and use of ICT in secondary schools in the Republic of Bulgaria through the prism the grounded theoretical framework and the obtained empirical results.

The main *research hypotheses* are:

1. The way of (not) integrating electronic diaries (as an example of digital technologies) into the educational process depends on the existing differences in the social status of students and the related inequalities in the resources they and their families possess.
2. Insofar as the very (in)ability to be included in digital technology-based learning depends on the availability of certain resources, the existence of significant social inequalities in relation to these resources determines the functioning of ICT in education as a mechanism for transforming social inequalities into educational and in this way of legitimising them.
3. The possibility of the introduction of electronic diaries as a type of digital technology in education to cause change, including in terms of reducing existing educational inequalities, also depends on whether it is part of a more comprehensive transformation of the educational field in terms of its goals, content and relations between the actors in it.

The hypotheses of the research are analysed on the basis of data from the author's empirical study of the inclusion in the educational process of a specific digital technology - the electronic diary and the related communication platforms. E-diaries and distance learning platforms are technologies through which students and parents can benefit from shared information regarding student grades, absences, behaviour feedback. The main suppliers of these technologies are the companies Shkolo, Admin Plus and Siela, and from the academic year 2021/2022 the National Electronic Information System for Preschool and School Education was introduced - a web-based unified platform intended for use by principals, teachers, parents, students and administrative staff mainly in schools, kindergartens and centres for special educational support.

The choice of the electronic diary is determined by several main reasons. Firstly, this is a technology that has practically already been introduced in all schools in the country. Secondly, specific research on the role and effects of the introduction of electronic diaries is lacking. Thirdly, electronic diaries are perceived and understood mainly as a socially neutral technical tool, without analysing their functioning and impact through the prism of existing and emerging social and educational inequalities. *The dissertation problematizes and tries to reveal the semblance of social neutrality of the functioning of electronic diaries.*

Research strategy, sources and methods of data collection

The dissertation is based on theoretical paradigms built on the basis of a critical reflection on theories of educational inequalities in the sociology of education and on the concept of the social in Bruno Latour's actor-network theory (ANT). In sociology of education, there are significant traditions and undisputed achievements in the study of educational inequalities and their relation to social inequalities. Among the most prominent are the studies of R. Boudon on the primary and secondary effects of social origin (Boudon, 2012) and of P. Bourdieu on the roles of different types of capital (Bourdieu & Passeron, 1990). For the purposes of the PhD thesis, the understanding of the various types of educational inequalities is of particular importance.

The research approach is based on qualitative and quantitative methods for data collection - semi-structured interviews, focus groups and secondary data analysis. The reason for choosing this approach is that, with such a complex topic, it is necessary to collect different types of data, which will subsequently be compared and supplemented in order to achieve a greater completeness of the analysis and create an opportunity to highlight some statistically valid trends, as well as to "hear" and take into account the voices of different social actors.

The *following methods of data collection* are used in order to achieve the research goals and tasks:

- semi-structured interviews with principals, teachers, parents, interested persons regarding electronic diaries; representatives of the company Shkolo, who have created and maintain electronic diaries for the majority of schools in the country;
- focus groups with students and teachers;
- thematic analysis of digital data - discussions from the internet forum "Bg mama"

Risks and limitations

The dissertation study has several limitations that should be noted. First of all, this is the understanding of the concept of education, which is concrete and relatively limited, but related to the objectives of the PhD research. Education can be and is explored from different disciplinary perspectives – philosophical, pedagogical, economic, psychological, sociological. Accordingly, different authors adhere to different understandings of the concept of "education". The definition of education and its goals presupposes independent analysis with critical reflection on multiple concepts.

Secondly, the situation of the global pandemic of COVID-19 means that the results and conclusions in some sense are influenced and derived from it and probably would differ from results, obtained from researching education in a non-extraordinary situation. The restrictions imposed by the new virus created obstacles to the actual fieldwork and it was partially carried out through electronic means.

A main limitation of the dissertation work is related to the focus of the empirical research only on a specific digital technology – the electronic diary. As a digital technology used in education, the electronic diary has its own specifics. It is primarily associated with the organization and management of the educational process, and not directly with its content and methods of implementation. There is no doubt that research into the functioning of other digital technologies is also essential to verify the underlying hypotheses. Therefore, the analyses in the dissertation should be considered only as a basis for the initial understanding of the hypotheses, but not for their complete verification.

It is also important to note that the results are valid for the Bulgarian context, the specific educational stage, public schools and subjects and should not be generalized beyond these parameters. A case analysis approach with categorization of schools was chosen to allow the cases to be explored in depth at the school level and to be able to draw conclusions about similar types of schools.

Structure of the dissertation

In the introductory part of the dissertation, the problem situation, the research objective, the subject and the object of research, the research questions and their aspects, the hypotheses and the tasks are outlined. The research strategy, methodology and data sources, as well as the risks and limitations of the dissertation are described.

Part one presents the introduction of digital technologies in education and the various aspects of their influence on modern society. Part two is devoted to the theoretical framework. First of all, social and educational inequalities are analysed in the context of the rapid development of technologies and their introduction into education. On the other hand, the actor-network theory of Bruno Latour is presented, which considers digital technologies not just as tools, but as social actors that actively participate in networks of interactions and influence the processes in the educational system. Part three focuses on the introduction of digital technologies in secondary education in Bulgaria and an analysis of the normative framework, as well as an overview of the analytical strategy and the main results of the empirical study.

The concluding part analyses the significance of digital technologies in education. In the absence of appropriate strategies and resources, inequalities are reinforced. Attention is drawn to e-diaries as a concrete example of a digital technology that can act as a two-sided mechanism - on the one hand, as a means of improving educational engagement and access to information, and on the other hand, as a factor in increasing inequalities due to uneven access to the necessary technologies and Internet. In addition, the importance of educational policies and practices for the optimal use of digital resources in the pursuit of equality and justice in the educational process is considered.

Part one

1. Digital technologies and education – a helping tool or active participant in the educational process

Young people born after the 1990s are significantly different from previous generations in terms of lifestyle, communication and thinking, and the assumption is that this is mainly due to their birth and upbringing in a world of advanced technology and Internet. This digital generation, also known as Generation Z, was brought up in an era of multitasking, intensive use of social networks and a preference for reading from screens and playing computer games. They see information and communication technologies (ICT) as an inevitable part of their daily lives.

In education, there is a disconnect between rapidly evolving technology and teaching methods that often remain unchanged. Young people face significant global challenges, including financial crises and pandemics, exacerbating the need for adaptability and innovation in technology and education.

1.1. Introduction of digital technologies in education

In the context of contemporary education, the significance of ICT is seen as a potential revolutionary element in the learning process, although so far no dramatic transformations have been observed in the methods of teaching and learning in classrooms. "To be effective, the process of introducing technology in education should require and include planning, leadership, new ways of teaching and learning, capacity building" (Mattila & Silander, 2015: 1). Furthermore, this change requires adaptation not only in the educational system, but also in society as a whole, encompassing changes in attitudes and thinking of all stakeholders.

Technological innovation alone does not constitute pedagogical innovation. How teachers and students apply and perceive them in the learning environment is key. It is particularly important to overcome the challenges associated with the integration of ICT by developing reflective practices that enable a critical view of the use of technology in education.

1.2. Digital technologies in education: opportunities, effects and challenges

ICTs are inextricably linked to the daily life of modern students, which raises the issue of their uses in education. Possible applications of ICT in education are highlighted based on research, primarily by authors in other countries. There is no doubt that the way ICT is introduced into education and the results of this process are related to the specifics of the concrete educational system and the wider social context.

The main function of ICT is associated with information processing, but their communication function is also gradually being established. Within the educational process, through the computer, students can mainly communicate with each other and with their teachers. ICT is also used to disseminate learning material, with the abundance of online resources enriching the learning process. Finding and disseminating information become key skills. Creating your own content through ICT is important to the learning process, as students can generate new knowledge and share their creations online, which can increase their motivation.

The use of ICT in education can develop communication, collaboration, creativity, and critical thinking skills. However, the effects of technology are not solely positive. Research shows that frequent use of computers can reduce student achievement. Technologies, often developed for commercial purposes, can distract students with non-curricular activities such as chatting or playing games, leading to poorer learning outcomes. The problem of distraction and ineffective use of ICT in education has been noted by numerous studies that support the view that without purposeful use and adequate control, technology can be damaging to the learning process rather than helping.

Some teachers see ICT as a useful tool to support educational research, while others believe that it leads to superficial learning and distracts students. Enhancing engagement through ICT depends on teaching methods and opportunities to implement digital technologies in the classroom. Although some research shows that a preference for digital learning can lead to higher engagement, the lack of opportunity to implement it can reduce students' interest in learning.

Furthermore, the effectiveness of ICT in education depends on teachers' skills in selecting appropriate technologies and managing the unplanned and invisible impacts of technology in the school environment. They can also be seen as an effect of the "hidden curriculum", insofar as it is expressed in "implicit and unplanned, invisible messages of educational practices and the organization of the school space, the influence of which is too

often stronger and more important than the planned training activities” (Ilieva-Trichkova & Boyadjieva, 2019: 35). Research shows that the impact of ICT in education depends on the context and mode of use, and more in-depth research is needed to understand its intended and unintended effects.

Part two: theoretical framework

1. Social and educational inequalities

Social inequalities arise from various social characteristics, such as income, education, occupation, which, according to many researchers, group people into different social strata or classes. These preconditions lead to distinctions between groups and individuals within them, which creates inequalities.

According to Georg Simmel (1998: 205 cited in Marinova, 2010: 70), “[c]onceptualized in the category of “interaction”, inequality can be understood as a “structured event” or a “fragmented structure”. For example, the poor, who are completely excluded from the process of giving and receiving, do not participate in social interactions, which places them in a state of absolute exclusion rather than inequality. Inequality requires active participation and interaction where both parties have equal participation. Simmel emphasizes that inequality stems not so much from a lack of possessions as from the comparison with others who possess those goods.

Pierre Bourdieu made a significant contribution to the understanding of social inequalities through the concept of capital. According to him, “the social space is constructed in such a way that agents and groups are located within it according to their positions in statistical distributions according to the two principles of differentiation which in the most advanced societies...are undoubtedly the most operative—economic capital and cultural capital. Therefore, agents have more in common with each other when they are closer on these two dimensions, and less the more distant they are” (Bourdieu, 1997: 23-24). This leads to differences in social positions and determines the capabilities and practices of individuals. Bourdieu introduces the concepts of habitus and field to describe the interaction between individual schemes of action and social structures. Habitus are “enduring and transferable schemes of perception, evaluation and action” and fields are “systems of objective relations” (Bourdieu and Wacquant, 1993: 76).

A key point in Bourdieu's analysis is the idea that social spaces are scenes of power struggles where agents compete for resources and recognition. This leads to constant changes in social positions and structures. Bourdieu emphasizes that social reality exists in both the material world and subjective perceptions, with habitus being the key to understanding this dual reality (Bourdieu, 1997).

The author considers social fields as networks of objective relations between different social positions, such as the school system, the state, and others, which are regulated by their own logics and rules (Bourdieu and Wacquant, 1993). In these fields, agents compete for influence using different types of capital or power resources, such as economic, cultural, and social capital. Capital determines the positions of agents in the field and influences their relationships and opportunities for assertion. Bourdieu emphasizes that the educational field has its own specificity and history, which distinguishes it from other fields with unique "rules of the game". In this context, differences in capital possession among students affect their educational opportunities and success. Moreover, the economic logic and the drive to maximize human capital permeate the educational field, leading to segregation and strengthening social inequalities. Some authors such as L. Deyanova define the economy as driven by innovations, but in contemporary times and the introduction of ultra-modern technologies, scientific capitals are increasingly becoming added value in the field of economics (Деянова, 2020).

The concept of capital can best be understood by considering the types of capital – economic, cultural and social. Economic capital is understood as “private ownership of the means of production” (Бурдйю, 1997: 34). Cultural capital exists in three different forms: incorporated state, objectified state, and institutionalized state. "Its incorporated state refers to long-lasting attitudes of mind and body, its objectified state - cultural goods such as paintings, books, musical instruments" etc., and its institutionalized state is educational qualifications (Bourdieu, 1986: 243). Cultural capital includes education and cultural skills that can translate into social recognition and prestige. "The amount of social capital possessed by an agent depends therefore on the extent of the network of relations which he can effectively mobilize and on the amount of capital...held as his own by each of those with whom the agent is connected" (Бурдйю, 2003: 69). All these types of capital can function as symbolic capital when they are recognized and valued by other agents in the field. Any difference recognized and accepted as legitimate functions as symbolic capital that brings distinctive profit.

It is necessary, however, to highlight another key type of capital that links ICT to other fields, namely technical capital (Zhang, 2010). It is defined as the structural relationship

between technology and other social agents (Zhang, 2010: 1021). Whether agents recognize these connections or not, they nonetheless constrain and guide them. This definition differs from the perspective in which technologies are treated as supportive tools that can be used in social interactions and is used in the empirical analysis.

1.1. From social to educational inequalities

According to Pierre Bourdieu, the education system plays a key role in the reproduction of social inequalities, thus functioning as a latent mechanism to maintain the status quo and socio-economic differences. Inequalities in education are determined not only by the individual abilities or efforts of students, but also by their social and economic background, cultural environment, and above all by the cultural capital passed down in the family. The habitus that children inherit from their families are reinforced and reproduced in the educational process, limiting opportunities for social mobility (Бурдйю, 2010). Thus, the school not only fails to equalize the chances of success between children from different social groups, but often contributes to the deepening of existing inequalities.

Social inequalities have been studied and analysed through the aspect of their influence in the educational sphere also by Raymond Boudon (Будон, 2012). Boudon analyses social inequalities in education by distinguishing between primary effects related to school success dependent on social status and secondary effects resulting from the parental choice of school. Despite the democratization of education, social mobility and equality of educational opportunities remain stagnant, with educational and social inequalities interrelated and leading to different life paths.

1.2. Educational inequalities reflected in international empirical research

International empirical studies focus on educational inequalities, especially in the context of the Bulgarian education system, highlighting key aspects related to the introduction and integration of ICT in education. The Program for International Student Assessment (PISA) of the Organization for Economic Co-operation and Development (OECD) defines education systems as equitable when student success depends more on individual effort than on contextual characteristics such as ethnicity and socioeconomic background. PISA results show a significant relationship between parents' educational status and the type of school students attend, with particular attention to vocational schools and their students with lower socio-

economic status. Research finds significant social segregation in education systems, which affects student achievement and widens social disparities. This segregation is often the result of parental choices leading to division of students by socio-economic characteristics into different types of schools, which in turn leads to different educational opportunities. Our country stands out among the countries with the largest gap in student achievement related to school type and socio-economic status, which highlights the perception of the "most unfair" education system in terms of equality of opportunity compared to other European countries.

It is important to note that horizontal differentiation in education, which represents different types of schools with different curricula and future prospects for students, plays a significant role in increasing educational inequalities. These differences create an uneven educational environment that not only differs in quality and prestige, but also affects students' motivation and future decisions. Subsequent analyses highlight the key role of social segregation and horizontal differentiation, as well as regional disparities in creating skill gaps among students that are critical for economic growth and digital skills development.

2. Digital technologies as a social actor

2.1. Actor-network theory

Bruno Latour, a French researcher, philosopher and sociologist, offers an innovative view of the social, focusing on connections and relations between actors instead of traditional structures and categories (Латур, 2007). He distinguishes "sociology of the social", which sees the social as a static material, from "sociology of associations", which emphasizes the dynamic processes of association and re-association that create social bonds. Latour develops actor-network theory (ANT), which emphasizes the role of human and non-human elements in the formation of social and scientific facts, rejecting the idea of the existence of predetermined "social explanations". Latour applies this approach to a variety of fields, including the study of scientific laboratories, showing how scientific facts are socially constructed through everyday practices and interactions.

2.2. Potential of key concepts from actor-network theory for researching digital technologies in education

For the purposes of the PhD thesis, it is necessary to highlight the heuristic potential of basic concepts in ANT, with a view to their applicability for researching digital technologies in education. The analysis of the following parts mainly relies on the concept of translation, which is key to ANT, therefore the part focuses on it, introducing several other concepts that are key to the paradigm, with particular attention being paid to the concept of "inscription".

Inscription refers to the creation of technical and social arrangements that facilitate or constrain interactions in the educational process. On the other hand, translation explains how different actors, human and non-human, connect and create networks that change the educational context (Latour, 1992 cited in Carroll, 2014). Translation is a process that, in order to be successful (which is not guaranteed), is characterized by four main stages. *Problematization* is the first or preliminary stage in the process of translation, where one or more actors seek to redefine the network in which they are involved. In the second step of translation, that of *interessement*, the controlling actors seek to stabilize the identities of the other actors in the network, according to how they defined them in the first stage. The third step of the transfer is *enrolment*. If actors get interested by using the interessement device, they are included into the network. *Mobilization* is the final step, but not the least important. It is based on the transformation of actors in the network into allies and the realisation of this role, with the aim of attracting additional actors, which subsequently leads to the expansion of the network (Callon, 1984).

Key concepts in the dissertation are the concepts of "intermediary" and "mediator" (Jaryp, 2007). The mediator is simply a substitute who does what anyone else in their place would do, and is the sum of its constituent parts. The intermediary, on the other hand, adds something of itself in the course of the interaction and thus constantly changes and transforms it (Latour, 1999, 2002, cited in Sayes, 2014).

ICTs are "non-human" according to ANT. It is therefore important to emphasize what non-human actors are, another central concept in the thesis. "Non-humans" (see Jaryp, 2007: 12) are perceived as mediators. Non-human actors possess agency in influencing social relationships and are not merely passive intermediaries. It is also necessary to point out that in his late works Latour emphasized the concept of "assemblage". Assemblages represent the aggregate of multiple associations, insofar as associations, in turn, are the connections between actors in the network constituting the "social".

Last but not least, it is important to mention the concept of network. Bruno Latour explains the use of the word network as being particularly suitable for describing social connections. "Instead of thinking in terms of two or three dimensions, spheres, or other objects, when talking about a network we think in terms of points that have as many dimensions as connections" (Latour, 1996: 370).

2.3. Researching education through ANT

ANT studies of educational practices, such as telemedicine consultation or classroom learning activities, highlight the complex relationships and interactions between different actors, including technology. These studies reveal how knowledge is mobilized and transformed in the learning processes, paying attention to the "systems of fragmented knowledge" that participants must navigate and interact with. The ANT approach makes it possible to understand technology in education not only as a tool, but also as an active participant that changes and enriches pedagogical practices.

Concepts such as "cyborg" and standards in education further expand the understanding of interactions in the educational network by showing how human and technological actors create mixed identities and practices. The implementation of ANT in education reveals the dynamic and interconnected nature of learning, where standardization and assessment become mechanisms for the translation and mobilization of knowledge, showing the importance of analysing educational practices through the prism of the network of interactions between diverse actors.

Tara Fenwick and Richard Edwards (2010) consider actor-network theory (ANT) as an important tool for analysing educational standards and the ways in which they acquire and maintain stability through various associations. ANT offers a new look at standards, revealing the possibilities and heterogeneity embedded in them that often remain hidden in traditional analyses. According to this theory, standards are not fixed and immutable, but dynamic and susceptible to different interpretations and applications, allowing for greater flexibility and diversity in educational practices.

ANT also provides a framework for understanding the importance of educational reforms and how they are implemented through networks of interactions between different social actors. This theoretical perspective emphasizes the flexibility and uncertainty of educational processes, opening up opportunities for innovation and change in educational

practice. It is important to emphasize that the success of educational reforms depends on the network's ability to include and mobilize different actors in support of changes.

2.4. Research perspective towards social and educational inequalities through the lens of ANT

The review of literature on the topic of social and educational inequalities highlights several main types of inequalities that have a significant impact on children's access to education and educational achievement. These inequalities include differences in the socio-economic status of families, the resources of different schools and educational resources between different localities. They are not isolated from each other but are interconnected and mutually reinforcing. From a sociological point of view, the essential question is to what extent these inequalities translate into educational inequalities between students coming from families of different socio-economic status, educational inequalities according to the type of school, as well as educational inequalities according to the place of residence.

The sociological theories of Pierre Bourdieu and Raymond Boudon offer a framework for understanding issues related to educational inequalities, emphasizing the role of cultural and social capital, as well as habitus, as key factors influencing educational attainment. Applying Bruno Latour's actor-network theory allows further exploration of the interaction between human and non-human actors in the educational process, which can contribute to the creation and change of networks in the educational field and reveal how technological capital affects educational opportunities and achievements.

The inequalities in the education system between different schools and regions reflect differences in the socio-economic status and cultural capital of families, leading to differences in educational opportunities and achievement among students. It is important to emphasize that these educational inequalities can be reproduced and even exacerbated in the school environment, including both the primary effects related to student success in school and the secondary effects related to parental school choice.

3. Digital technologies and educational (in)equalities

The introduction of digital technologies in education creates new types of inequalities between students that go beyond the traditional understanding of the digital divide limited to access to technology and the Internet. These inequalities, known as digital inequalities, include

differences in the quality and type of technical means used, autonomy of use, skills to use technology effectively, social support in its use, as well as differences in purposes for using the Internet (DiMaggio & Hargittai, 2001). These dimensions directly influence users' Internet experience, the types of activities they undertake online, and the benefits they derive from digital interactions.

The quality of technology determines the effectiveness of digital participation, while the autonomy of use focuses on freedom and independence in using the Internet. Differences in Internet use skills determine cognitive access to information and the effectiveness of online surfing. Social support plays a critical role in facilitating technology access and use, and use goals reveal the motivations and ambitions behind online activities.

In the context of education, digital inequalities can hinder or enhance educational opportunities and outcomes depending on how students use technology to learn. Having computer skills and access to the Internet at home is associated with better educational achievement, especially among students from families of higher socioeconomic status. On the other hand, the way technology is used in school and at home varies, and initially the introduction of computers in schools has often proved pedagogically ineffective due to the lack of readiness of teachers to integrate technology into the learning process. Research also highlights that digital inequalities reflect and reinforce existing social structures, with high-status groups tending to benefit more from their online activities than lower-status groups.

Research shows that the introduction of digital technologies in education can contribute to the expansion of existing social and educational inequalities. Students from low socioeconomic status families are often at a disadvantage due to limited access to modern technology and the Internet. This deprives them of opportunities for self-learning, online communication and participation in digital activities that can enrich their academic and social skills. At the same time, children from high socioeconomic status families often possess digital skills that exceed the curriculum and even the knowledge of some teachers, creating challenges in the standard educational environment.

The analysis carried out showed that the digital divide refers to inequalities not only in terms of access, but also in terms of use (having the skills to use) and the results (benefits) of this use. It is these three types of inequalities that outline the perspective through which the data from the author's empirical study of the functioning of electronic diaries in three types of secondary schools in the country is analysed.

Part three: Problematization of education. Digital technologies, creation of the educational environment and (re)production of educational (in)equalities

1. Digital technologies in secondary education in Bulgaria

In this part of the dissertation, an attempt is made to trace the process of problematization within the educational process by the controlling actor - the Ministry of Education and Science (MES). In other words, here is show the preliminary step in the translation process, in which MES seeks to define, at this stage on paper, the network it controls, as well as the identities of the other actors, which are already a part of the network – schools, documents, institutions, parents, schools, students, etc. Based on this, in the following sections an attempt is made to demonstrate how, on the basis of these preliminary definitions, the next steps in the translation process – interessement and inscription – are carried out through several empirical cases.

In recent years, especially in the context of the COVID-19 pandemic, Bulgarian education has undergone a significant transformation with the shift to online learning. This change was forced by social distancing measures and school closures, which required schools and students to quickly adapt their teaching methods and start to use online platforms for communication and learning. Although many schools had already implemented certain technologies in the learning process before the pandemic, the emergency highlighted the differences between schools in terms of technological readiness and the ability to adapt to distance learning.

In response to the need to modernize the education system and improve the quality of education, the Bulgarian government and the MES have taken a number of initiatives to implement ICT in schools. These initiatives include the development of national strategies and programs for equipping schools with computers and the Internet, the inclusion of ICT in curricula and the development of teachers' skills in this area. Despite the efforts made, challenges remain such as the lack of sufficient online educational content and the necessary training of teachers for the effective use of ICT in education. In practice, the shift to distance learning has revealed the potential of this form of learning, but it has also highlighted the need for further investment in technological infrastructure and training of teachers and students in the use of digital devices and learning platforms.

A study conducted by the Institute for Research in Education assesses the impact of distance learning, introduced in Bulgaria due to COVID-19, on the effectiveness of school education. The evaluation analyses the level of access to the Internet and technology both in schools and at home, the preparation and skills of teachers to teach in a digital environment, and the impact of distance learning on students and their families. One of the main findings is that most schools and teachers have the necessary equipment and access to the Internet, but there are significant differences in the preparation and commitment of the school community to distance learning (Институт за изследвания в образованието, септември 2020).

Despite the availability of technology and Internet, the evaluation highlights the low commitment of the school community and the discrepancy between the expectations of effectiveness and the actual results of distance learning. Only a small percentage of teachers have incorporated innovative methods in their teaching, and students and their parents have difficulty adapting to the new learning format. The institute finds the need for additional training and support for teachers, as well as for more active involvement of parents in the educational process. The results of the study highlight the importance of the integration of ICT in education, but also reveal the challenges and limitations associated with the transition to distance learning, especially in the context of preserving educational effectiveness and reducing social inequalities (ibid.).

The report of the Institute for Research in Education and the analysis of the MES from July 2021 study the implications of distance learning in the 2020/2021 academic year in Bulgaria, emphasizing the adaptations undertaken to provide synchronous and asynchronous learning (МОИ, 2021). Despite the achieved results without significant issues in the conduct of national examinations and assessments, the mental stress on students and teachers and the increased risk of student disengagement are highlighted. Decreased engagement and motivation are cited as the main reasons for the ineffectiveness of distance learning. In addition, the report highlights the problems of vulnerable groups of students who face additional challenges in accessing education due to lack of appropriate resources and support in the home environment. These observations highlight the need to address social and educational inequalities exacerbated by the pandemic and distance learning.

In addition, it is necessary to emphasize that the electronic diary was not analysed in any of the cited reports, except for one mention in the analysis of MES regarding the increased number of unexcused absences by nearly 70% compared to the previous year, the data being extracted from the electronic diaries of schools in the country (ibid).

1.1. Electronic diaries and platforms for education from a distance. Analysis of the regulatory framework.

The introduction of electronic diaries in Bulgarian schools began in 2017, with the shkolo.bg platform establishing itself as the leader among the platforms used. This process is preceded by regulations and incentives for schools to shift to digitalisation of the learning process. The strategic documents of MES from 2016 and the following years define the framework for the introduction and support of electronic diaries aimed at modernizing the educational process and reducing the administrative burden for teachers. Electronic diaries offer a number of functionalities, such as the possibility to exchange learning content, direct communication between teachers and parents, and the integration of results from official assessments.

In the academic year 2022/2023, the MES enforces the requirement that all schools use electronic diaries, providing freedom of choice between different providers of such services. The goals of introducing electronic diaries include reducing bureaucracy, increasing the commitment of parents and students to the learning process, by using modern technologies to facilitate interaction and motivation in the educational process. Despite the clearly expressed goals of the providers of electronic diaries, there is a lack of concrete impact assessments and analyses by the MES regarding the effectiveness and acceptance of this innovation by all participants in the educational process, especially among vulnerable groups.

2. Digital technologies, social and educational (in)equalities – empirical studies

2.1. Analytic and research strategy

The analysis uses theoretical frameworks to examine technological effects in education in Bulgaria, with an emphasis on inequalities. It follows Bourdieu's approach to examining different social positions in the educational field and their relation to digital technologies, demonstrating how these relations are conditioned by the social position of the participants. By analysing three different cases, it shows how different types of social positions in education influence the way technology is perceived and used. The second analysis (micro level) examines the effects of the introduction of new digital devices and platforms in the education system and how they are accepted or rejected by different actors. The approach emphasizes the

role of the digital diary as a means of accumulating educational capitals, depending on the social structure and location of schools.

The analysis relies on the notion of translation. With the use of this analytical tool, the aim is to turn the perspective towards the Ministry as the actor controlling the educational network. Translation also serves to some extent to structure the analysis. It begins with the first step - definition, where it is analysed how the actor controlling the network defines "on paper" the identity of the actors in the network. This part describes what the MES expects from them.

Although Bruno Latour's theoretical framework allows analysing digital technologies as a social actor, its application in analysing hierarchical institutional systems with existing significant inequalities, exclusion of certain groups and marginalization, such as Bulgarian education, cannot be uncritical and has its challenges. In view of this, as already indicated, the theoretical apparatus of Bourdieu is also used, which allows focusing on social and educational inequalities. Using the same set of concepts to analyse the three cases allows them to be compared so that valid conclusions can be drawn.

2.2. Methodology of the field research

The dissertation researches the role of electronic diaries in Bulgarian secondary schools, analysing how they transform the educational process and the interactions between the participants. The empirical study focuses on issues such as the transformation of the educational process through digitalisation, the impact of social inequalities on the integration of e-diaries and how they affect access to and engagement with education. The research also analyses the emergence of new "digital inequalities" and changes in power relations in the educational sphere as a result of the integration of electronic diaries.

In the period October 2021 - October 2022, three schools were visited, which are distinguished by the following indicators: stage of education (secondary school/high school), geographical location regarding district and settlement (large city, village), average success from the state matriculating exams in Bulgarian language and mathematics for the academic year 2019/2020, use of digital technologies and electronic diary in the school, as well as socio-economic status of the population in the settlement and the region, presented through various indicators.

The data, published by the National Statistical Institute, outlines the differences in the socio-economic situation in the three selected regions in relation to the case analysis. Data is

presented for 2021 and 2022, as this is the year in which the field study was conducted, but the differences persist in 2023. Household income (economic capital) varies according to the areas selected for the three cases of analysis. The average household income is highest in the third district and lowest in the first. The situation is similar with regard to the share of the population at risk of poverty or social exclusion. It is highest in area case 1 and lowest in the third area. From the share of the population aged 7 and over by different levels of completed education (cultural capital), it can be seen that in the first municipality there is a higher share of people with basic and elementary education, as well as with secondary education, while respectively, the people with higher education are the least. At the same time, in the second case there are the most people with secondary education and the share of university graduates is increasing, and in the third municipality there are the most people with university and education and the least with basic and elementary education. As for the distribution by ethnicity, it could be seen that in the first municipality the share of Roma is significant - 10%, in contrast to the other two municipalities.

Based on the data presented, the chosen schools could be characterised in the following way:

- Case 1 “School lagging behind” – located in a small village, with very low average grades of the students from the state matriculation exam, using an electronic diary and some technologies, with a low socio-economic status of the population and marginalised groups from the Roma ethnic group;
- Case 2 “Average type of school” – located in a bigger town, with an average level of success from the state matriculation exams in comparison to the other secondary schools across the country, using an electronic diary and some digital technologies, with an average or mixed socio-economic status of the population in the region and town;
- Case 3 “Leading school” – located in a key regional city, with a high average rate of success from the state matriculation exam, using an electronic diary, with a high socio-economic status of the population in the city;

Qualitative methods are used for the analysis, including a case study in the typologically selected schools, described above, and thematic analysis of forum discussions. Three interviews were conducted with high school principals; six interviews with teachers and one focus group with (six) teachers; four focus groups with students from grades 9, 10 and 11 (with about 6-12 students per group); one focus group with parents of students (with five participants)

and one interview with a parent of a student; six completed questionnaires by parents of students; an interview with a representative of a company that created and maintains an electronic diary in Bulgarian schools. This approach allows for a detailed analysis of the different perspectives and impact of e-diaries in the real context of the learning environment. The research highlights the flexibility of the case analysis method, allowing for a comprehensive examination of the complex aspects of technology implementation in education, as well as for building on prior knowledge.

2.3. Main findings

Case one: Unrealised translation and failure of the intersement process

Socio-economic situation

In the first analysed case, a "lagging behind" secondary school is studied in one of the largest villages in North-West Bulgaria, where the socio-economic environment is extremely difficult due to high unemployment and low living standards. This situation directly affects the educational process and opportunities for students. The social community of this school is homogeneous, characterized by a high degree of vulnerability and poverty. Families with a higher social status and economic situation are isolated cases and represent exceptions. The school faces the challenges of high turnover among students, many of whom leave with their families in search of work abroad. Despite these difficulties, the school makes efforts to keep the educational process active and inclusive, using donations and budget funds to purchase the necessary goods for students from poor families.

Due to the particularities of the region's labour market, the high school profiles correspond to the type of occupations that are sought, mainly related to the cultivation of agricultural land. In this case, we can observe almost in an ideal-typical form the reproduction of social inequalities from the perspective of the conversion of capitals that Bourdieu theorises on. Students are placed in a social field in which cultural capital is defined by large local agricultural producers. The director's words "It is unlikely that the profession will be changed, because our region is like that" clearly show that due to the socio-economic underdevelopment of the region, the structural conditioning of the opportunities for professional realisation of the students turns into predetermination, into a kind of "entrapment" of the young people in existing social structures and inequalities and thus in reproducing existing inequalities.

The school adapts to the local socio-economic conditions by developing programs that meet the needs of the local labour market and collaborates with local businesses to provide internships for students. It thus seeks to provide students with skills that are in demand and improve their chances of finding a job in the region. Despite efforts to maintain high engagement and educational opportunities, the community faces problems such as dropping out of school due to family circumstances, going abroad or early marriage, especially among vulnerable groups.

The case highlights the importance of the school as a key factor in overcoming social inequalities in education, but also the limitations it faces as a result of external socio-economic factors. The school tries to compensate for the lack of resources and to ensure equal access to education for all students, but it has difficulties in overcoming the structural barriers that continue to reproduce social inequalities. This approach not only reflects the director's understanding of the existence of significant structural limitations for most of the families that shape the habitus of their members and their opportunities, but also shows the desire to overcome the barriers in the educational field that prevent equal access to education. This analysis reveals the complex interrelationship between the education system and broad socio-economic structures, highlighting the need for comprehensive approaches to addressing social inequalities in education.

Access of students and parents to the necessary resources

The socio-economic picture in the school described in this way gives reason to assume that inequalities have an impact on all aspects of the educational process. Distance learning due to the COVID-19 pandemic creates a need to use technology for basic participation in the learning process, and at the same time, electronic diaries as a non-human social actor introduced earlier, also participate in the network of actors in education. Of key importance is how this affects the access of students and their families to the necessary educational resources, and from there to education in general, in schools such as the one described, where a large proportion of students do not have high levels of economic, social and cultural capital and live in poverty. Essential to incorporating the e-diary into the network of human actors and creating connections and assemblages between them are the skills of students and parents to use electronic resources, namely the availability of technical capital, as well as internalized perceptual schemes, thinking and acting that characterize them and determine their attitude to education and socio-economic challenges.

It is a characteristic of the habitus of most of the parents that they are not interested in their children's education. The principal reveals:

„we have only a few parents who are interested to come in and see the child...”

The introduction of electronic diaries in education leads to challenges related to habits and skills for their use. The ability of parents and teachers to adapt to new technologies is critical to the successful integration of these tools into the learning process. Despite the advantages of electronic diaries for instant access to information, resistance to change and lack of technical skills can delay or limit their impact in the education system. As a result, some families are practically excluded from the educational process and can no longer follow the necessary information that they previously saw on paper. It is important to note that stakeholder and translation processes, which involve negotiation and adaptation, are key to overcoming these obstacles and facilitating the adoption of new technologies by all parties involved. Teachers share:

“The difference between an electronic and paper diary of the student... I mean for the parents, there is no difference. Like before, when we had paper diaries, we wrote 100 grades, nobody signed them and looked at them. It is the same thing now” ... “Here this is not a determining factor at all. If you are not interested on paper, stone, wood or papyrus...there is absolutely no difference.” “Well, we are using it, but talking about the parents, these feedback notes on their behaviour and stuff like that, they are for them, now they just don't check anything.”

The lack of technical and economic resources in some schools highlights the need to address "digital inequalities" that can reinforce existing social differences in access to education. There is no significant difference in the opinions of the different participants. The introduction of electronic diaries prompts a need for reflection on how technology is integrated into the learning process and how it affects the interactions between teachers, students and parents, especially in the context of schools with limited resources. The availability of technical capital – the skills and resources to use technology – is crucial for the inclusion of vulnerable groups in the educational process.

At the same time, a factor influencing how regularly the information in the electronic diary is tracked and whether the active party is the students and/or their parents (the actual human actors interacting with the non-human actor electronic diary) is also the age of the students. The various participants in the study shared that a greater proportion of parents follow the information in the e-diary while their children are younger until 4th grade, and then the

responsibility falls on the students. However, different functions of the electronic diary are not defined for different ages.

Platforms for distance education

The introduction of e-diaries and distance learning during the pandemic highlights the importance of technology in the educational process, while also revealing the deep socio-economic inequalities that affect access to education. The use of electronic diaries did not lead to significant changes in the learning process during the pandemic, as their functions were already part of the daily life of the school. However, a serious challenge is the need for distance education and the adaptation to different online platforms, which requires the active support and intervention of families in order for students to participate effectively in the learning process.

Some technical difficulties and the high costs associated with the integration of virtual classrooms in the Shkolo platform have hindered the smooth progress of distance learning. Regarding the different types of platforms that are used, the integrated virtual classroom in Shkolo is not widely used in this school. At the beginning there was an attempt to use it at the initiative of the principal, but it turned out to be too expensive, and at the same time, the teachers shared that the Internet ran out quickly (devices with limited resources were used) and the usage was more complicated. The presence of various technical problems when using the platform, combined with the high cost, interruptions or even transfer to another classroom suddenly in another class exclude this functionality from those utilised in the school.

The socio-economic situation of families plays a critical role in successful inclusion in distance learning. The lack of the necessary devices and internet connection, as well as insufficient skills to use them, puts children from vulnerable families at a disadvantage. This highlights the need for targeted efforts to overcome these barriers, including the role of educational mediators who act as an important bridge between school and families, especially in the context of low socio-economic status communities.

Despite the challenges associated with distance learning, there is general agreement among teachers, parents and students that face-to-face learning is preferable and effective. This reflects the understanding that despite the potential of technology to improve access to education, face-to-face interaction remains key to quality learning and student development.

Communication and control

Communication in the educational network, involving human and non-human actors such as electronic diaries, plays a key role in the stabilization and reformation of networks and the creation of assemblages. However, in the considered case of a "lagging behind" school, communication via e-diary and distance learning platforms is not effective, with parents remaining passive participants and preferring traditional methods of communication such as face-to-face or telephone. This lack of activity and commitment shows the failure of the translation process, where electronic diaries fail to establish themselves as significant actors in the network, leading to a lack of effective communication between parents and the school through these channels.

The analysis reveals serious structural problems and the existence of "digital" inequalities, with the lack of commitment and ineffective communication through electronic diaries reinforcing the disconnection between the school and families of low social status. At the same time, the proposal to integrate additional functions, such as the possibility of telephone communication through the electronic diary, could improve the interaction, but there is resistance to such changes based on the current perceptions and habits of parents and teachers.

Special attention is paid to the fact that despite the potential of electronic diaries to improve access to the educational process and facilitate control by parents, in a social environment of low social and economic status these technologies may actually contribute to the increase of educational inequalities. The practical non-participation and lack of motivation to use the diary as a communication tool highlights the need to develop strategies that take into account the specific socio-economic context and overcome existing barriers to parent and teacher engagement.

The analysis of the first case shows that in practice it does not create a real new network of human and non-human actors, and electronic diaries exclude certain families from the educational process. Given the prioritisation of access to economic capital for families, e-diaries do not improve access to results and interest in the educational process, but reproduce – and even reinforce – the disconnection between the school and families of low social status. Therefore, in a social environment dominated by families with low social status and limited economic, cultural and technical capital, e-diaries function as a mechanism to transform social inequalities into educational ones and thus to legitimise them, accordingly the translation process fails.

Case two: A fragmented network, unrealized translation, but an available opportunity to reduce the impact of social inequalities

Socio-economic situation

The second analysed case presents a secondary school - a vocational high school in electrical engineering and electronics, located in a large city in South-Eastern Bulgaria, as an example of an "average type" educational institution. The town, with a population of about 210 720 people, has been identified as an important economic and industrial centre, with a strong presence in the manufacturing of electronics, refined petroleum products, as well as a developed tourism sector. The high school offers a variety of majors, including medical engineering, electrical installations, telecommunications systems, and computer technology, focusing on digital technologies and participating in numerous digitalisation and innovation projects. The school strives to improve the quality of education through various initiatives, including IT and foreign language training. As presented by the data from the National Statistical Institute above, the school has an average level of socio-economic development compared to the other two cases, respectively, the group of students is not homogeneous according to status, education of the parents, etc.

Access of students and parents to the necessary resources

The research highlights the key role of the e-diary in engaging students and their families in the educational process. Although most families have access to the necessary technologies, there are differences in technical skills and capabilities, which can make it difficult for some students to be included and create new forms of digital inequality. The school is taking measures to reduce this gap by donating internet and devices and helping families in need.

The case illustrates the importance of equity in the perception and use of e-diaries in the educational process. Families with higher economic and cultural capital have better access to technology and information, which facilitates their inclusion. At the same time, existing socio-economic inequalities and limitations in technological literacy can reinforce the division between families, highlighting the role of the educational field as a space for the competition of different interests and capitals.

Platforms for distance education

In the second analysed case, distance learning turns out to be a challenge for many students, especially regarding the practical aspects of education in vocational high schools. Difficulties in conducting practical lessons, such as working with a soldering iron, are highlighted as a major problem, as such activities prove almost impossible to carry out effectively at home through electronic resources. Additional difficulties are the lack of suitable conditions for learning in the home of some students, where noise and the presence of other people in the room make the learning process difficult. However, distance education offers flexibility and the ability to participate from different locations, which some students find positive, even if it does not significantly increase the effectiveness of learning.

The distance learning platform in Admin plus is not actively used, and at the very beginning of distance learning, all kinds of different platforms were used, such as Google Classroom, Discord and Moodle, then everyone started using Microsoft Teams.

Ultimately, both students and parents express a preference for face-to-face learning, emphasising its importance for the effectiveness of the learning process and social interaction among students. The school is prepared to provide laptops to students in need in the event of subsequent stages of distance learning, thus highlighting the institution's commitment to providing access to education for all students.

Communication and control

Communication between students, teachers and principals through the electronic diary has been highlighted as a key element for building links in the educational network, although it is not fully implemented. Despite the presence of opportunities for communication through the platform, it is mainly used for one-sided announcement of information by the school, without active participation or response from the parents, which leads to weakening the connections in the network. Teachers share:

“In principle, there is an opportunity, yes, for communication, messages are posted, also everyone has the opportunity to note down tests, exams, such things, a schedule for colleagues or some other events... Now whether parents read them and use them, I can't I say.” “Yes, the method of communication here is also one-sided, that is, we put the messages and that's it, there is no possibility for them to reply and write.”

There is no difference in the opinions of teachers, students and parents, as the latter share that electronic diaries do not influence the learning process, but only provide information. They note that they rarely or never use the diaries to communicate with teachers. This lack of communication affects both interactions between people and between human and non-human actors in the education system. There is a marked tendency for parents and students to turn to alternative communication channels such as chat platforms that do not provide educational content such as grades or absences, even though the e-diary offers these options.

On the other hand, the analysis reveals that despite the limited use of the electronic diary for communication, it plays a role in increasing control over the learning process, but this is not perceived as a negative effect. The quick access to information about grades and absences that the diary provides is seen as a positive aspect by parents and students, as it increases the visibility of academic achievements and contributes to better engagement with the learning material.

Case three: Emergent network and success of the process of translation

Socio-economic situation

The third analysed case studies the so-called "leading school" – an elite language high school in a large and economically important city in Southwestern Bulgaria. The school is distinguished by high academic achievements of its students, especially at matriculation exams, and plays an important role in the educational context of the region. The city is characterized by a high gross domestic product per capita, a well-developed labour market and high investment activity. Also noteworthy is the high share of households with access to high-speed Internet. As it can be seen from the data of the National Statistical Institute presented above, in the third case the students and their families have a high socio-economic status and are a homogeneous group. The district stands out with a favorable demographic picture and leading indicators in education, which implies a strong foundation for the development of the school and its students. The high school works on a number of joint projects with national and international organisations.

Access of students and parents to the necessary resources

Access to the necessary resources is critical for student participation in the educational process and successful integration into the network of human and non-human actors. In this context,

the families of the students studying in the elite high school have enough capital to provide basic access to electronic resources and the Internet, which allows their children to participate fully in the educational process. However, it is clear from the research that the attitudes and motivation of families play a key role in the active use of electronic resources such as the electronic diary, which has become an intermediary in the educational network. The interest and commitment of families in the educational process of their children, as well as the adaptation to modern technologies, are essential for strengthening the ties between school and home. It is significant that even with sufficient resources, problems can arise due to the lack of appropriate attitudes or understandings about the use of the e-diary, highlighting the importance of educational and technological literacy not only for students but also for their parents.

Platforms for distance education

Distance learning, introduced in response to the pandemic, has had an impact on all schools analysed, including the elite language high school from the third case. The principal of the school emphasizes that the classical teaching method and face-to-face training are more effective and meaningful compared to the online format. However, teachers note that the move to distance learning has allowed them to improve their technical skills and adapt the learning content to the new environment. They share the positive effect of distance learning introduced, including increased opportunities for student independent work and innovations in teaching and testing methods. Some teachers share:

“ So it's much better for us teachers. Now about e-learning, I admit that I already have a lot of work experience and I'm nearing the end of my career, but if it wasn't for this online training, I wouldn't have learned to work with Teams, I've already worked with three or four of these platforms. At school only with Teams, but in other circumstances, I wouldn't learn these things. ”

A response to the newly created need for distance learning is the platform created by the representatives of the e-diary, which, however, is used by a relatively small share of schools. The preferred distance learning platform in this case turns out to be Microsoft Teams, introduced by the ministry, which reflects the general trend and challenges associated with other platforms such as the one in Shkolo. Students in the study did not mention the use of online platforms other than Teams, highlighting its dominant role in distance learning during the pandemic period.

Communication and control

In the third analysed case, communication through the electronic diaries between teachers, students and parents does not take happen a lot, and this is explained by the conscious limitation on behalf of the principals to prevent the generation of unnecessary spam. Teachers indicate that parents respond to messages when they have the opportunity to do so, but the frequency of communication depends on the content of the information conveyed. Despite parents' active following of the information in the electronic diary, real two-way communication rarely occurs. The age of the children also plays a role in the degree of parental involvement in the communication process. The electronic diary is perceived primarily as a tool for reporting grades and absences, rather than as a platform for active dialogue between school and family. Even with the availability of technological means and functionalities, communication depends on social dynamics and relationships between different types of capital. Success in engaging parents and involving them in the educational process through electronic diaries requires understanding and responding to their needs and expectations. Despite the intention for electronic diaries to facilitate communication and become an integral part of the educational system, in practice they often remain unused for this purpose. This highlights the need for better social engagement and a change in approaches to the use of technology for educational purposes in order to achieve a more effective relationship between school and family.

The topic of control in the educational process is more widely discussed in the third analysed case compared to the others, but again the strengthening of control is not perceived as a negative factor. According to the principal, parental involvement increased with the use of the electronic diary, instead of the level of control. The access to the necessary information in real time is a major advantage that has had a positive impact.

Comparative analysis

Following the translation process, through the analysis of the three cases, three different translation scenarios are demonstrated: one that completely fails (the Ministry of Education fails to interest local actors); second, in which it partially succeeds (interests the actors, but falls short of mobilization, the final step in translation); third, in which the translation is successful. Differences in the educational and economic status of parents and related inequalities in their economic, cultural and social capital, as well as the age of students, are factors in the educational field and influence the occurrence of inequalities in the opportunities for participation and the benefits of the educational process.

From the comparative analysis, it can be seen that electronic diaries alone do not change the educational environment and the differences between schools in various aspects. They were not introduced with a view to achieving new educational goals, but to replace paper diaries and notebooks with an electronic version and thus improve the organization of education and above all the connections between the school and the family and the involvement of parents. Electronic diaries as a type of ICT formally change the educational environment by introducing a new non-human actor into it. However, this change is not merely technical and socially neutral. The introduction of electronic diaries is not implemented as part of a comprehensive reform of education and taking into account the existing social inequalities between students' families. Therefore, in schools where most families are of low social status, electronic diaries reproduce existing social inequalities and create new digital inequalities.

Conclusion

The new "normal" in education in the digital age is characterized by a learning process where human and non-human actors coexist. It is essential for the progress of the educational process to find out how the introduction of ICT changes the already established educational networks based on training and face-to-face communication and redefines the roles of the other actors in the network. The change in education and the introduction of new non-human actors into it takes place through the destruction of the old, face-to-face relations-based contacts between human actors and the construction of new heterogeneous social networks.

The dissertation allows to highlight limitations in the heuristic potential of some of the concepts of the actor-network theory from the point of view of their applicability to understanding the introduction of technological innovations such as the electronic diary in the educational process and the changes it causes in different social contexts. The analyses of the data from the conducted empirical studies show that technologies can function as intermediaries and as mediators in the educational field. Only in the third case of an elite school with a majority of students coming from families with a high socio-economic status and related economic, cultural, social and technical capital, the introduction of electronic diaries does not deepen inequalities and does not lead to the exclusion of certain families from the network of actors. At the same time, in schools where most students are from families of low socio-economic status, the institutional actor (MES), which introduced the electronic diaries, failed to interest the students and parents so that they would actively engage in the use of the diaries, so a network is never built with them. In this sense, research shows that non-human actors are not autonomous and socially neutral actors in the educational field. Their functioning depends both on different policies – whether, for example, at national or school level access to new technologies is ensured for all students – and on the types of capital possessed by families. The potential of the actor-network theory for the analysis of hierarchical institutional systems, such as the Bulgarian education in the case of the introduction of electronic diaries, should also be problematised. Electronic diaries were introduced by the Ministry of Education as mandatory for all schools, without taking into account the existence of significant differences between individual schools, and also the exclusion of certain social groups from certain schools.

On the other hand, Bourdieu's theory turned out to be particularly suitable and applicable to the analysis of the Bulgarian education system, characterized by significant inequalities in the socio-economic status of families, and also between different schools in terms of the resources they possess. In the modern conditions of ubiquitous penetration of

technology in all spheres of social life - and especially after distance learning became necessary due to the pandemic - there is a need to enrich the understanding of cultural capital by taking into account the presence of technical capital, reflecting access to technological resources of different kinds, the skills for their effective use and the benefits of this use. The analysis reveals that, on the one hand, electronic diaries are introduced centrally and without prior preparation, and, on the other hand, their use depends on the possession of certain capitals and habitus. In an environment with significant social inequalities, they function as a power tool that privileges high -status families and marginalizes – and even excludes – low-status ones.

Theoretical and empirical analyses in the dissertation work allow arguments to be presented in support of the formulated hypotheses (of course, the verification of these hypotheses presupposes the conduction of representative studies, a developed theoretical model and data processing with statistical methods). Empirical data showed that the way of (not) integrating digital technologies (through the example of electronic diaries) in the educational process depends on the existing differences in the social status of the students and the related inequalities in the resources they and their families possess. At the same time, the dependence of the inclusion of digital technologies in the educational process on existing social inequalities regarding these resources, conditions the functioning of ICT in education as a mechanism for transforming social inequalities into educational ones and thus legitimizing them. Specifically, the research highlighted important empirical facts that show that digital technologies have a role in managing the educational process but are used by all and do not exclude certain groups only in schools where students come from homogenous high-status groups, while in an environment with significant social inequalities reinforce existing inequalities and create new digital ones. On the other hand, the possibility that the introduction of electronic diaries as a type of digital technology in education can cause a change in the educational field, including in terms of reducing existing educational inequalities, suggests that it should be considered not just as a formal technological innovation, but as part of a more a complete transformation of the educational process in view of its goals, content and relations between the actors in it.

In the next few paragraphs, the results of the conducted research, which illustrate the formulated hypotheses, are presented in a systematized form. The three analysed cases reveal the presence of significant differentiation and inequalities according to the type of school and place of residence in the Bulgarian education system. On one hand, the first case is of a school that can be defined as "lagging behind", is located in a large village and is characterized by a low average success in matriculation compared to other schools in the country. The main

livelihood in the village is agriculture, the standard of living of the people is low and the unemployment rate is high and there is a dropout of students, as some of them go abroad with their parents to seek a living. The region has a lot of vulnerable groups, early marriages and the school is looking for different ways to meet the many basic needs of students. The second case is the so-called "average type" secondary school - a vocational high school in electrical engineering and electronics in a large city with an average level of success in matriculation exams compared to the other schools in the country. The city developed as an important industrial and economic centre with relatively low unemployment rates. At the same time, the third case is of the so-called "leading school" - an elite language high school with a high average success rate in the matriculation exams compared to other secondary schools in the country. It is located in a large, economically important city with a well-developed labour market. The high school is established as one of the leading profiled high schools in the country with consistently high learning results. The differences in the socio-economic situation of the three analysed cases determine the different perspectives for the students and imply significant socio-economic, transforming into educational inequalities between them, due to the different degree of ownership of the types of capital by their families. The availability or lack of resources such as relevant software, a working device through which new technologies can be accessed (smartphone, computer, tablet, etc.), a good Internet connection, network coverage, as well as the possession of skills, motivation and habits of using technology (that is, both technical, economic and cultural capital) is key to the construction of the network of human and non-human actors and the way in which non-human actors function within it. The use of e-diaries affects the presence of social inequalities between students (and their families), deepening and reinforcing them, to the extent that families of lower socio-economic status do not have access to the necessary resources (or types of capital) to use an e-diary, respectively, due to prioritisation of economic capital, they are not interested in using the diary and do not have the corresponding motivation. Subsequently, these social inequalities can be transformed into educational ones, related to the students' results in school and their interest and attitude towards education, which in the future will affect their professional realisation and thus create new social inequalities. Therefore, often in schools with more students from vulnerable groups, neither electronic diaries nor other technologies are used to their full potential, learning during the pandemic period is carried out asynchronously, not synchronously from a distance, and matriculation results are generally lower. This means that digital technologies fail to integrate into networks with human actors in cases where these actors are from families of low social status.

Communication between students, teachers and parents through the electronic diary was practically not realised neither before, nor during the pandemic. Teachers upload grades, absences and feedback in an electronic platform instead of the paper diary, and students and parents are mainly informed. Students do not have "rights" to communicate through the electronic diary, and this is taken for granted by most social actors in the process. Parents have a formal right to communicate, but they are not well informed about it and it is usually taken away by teachers and principals through the platform.

Although parents may be informed at all times about their children's grades, absences and feedback, the increased control is not perceived as a negative effect by the study participants, but rather leads to a higher degree of engagement and awareness, even responsibility of the students. In the "lagging behind" type of schools, the fact that for most parents education is not a priority value and they do not show significant interest in it, due to the need to accumulate economic capital, turns the electronic diary into an invisible and ineffective actor. The network between e-diaries as a non-human actor and human actors is loose because the connections between them are not stable and new ones are not created, in view of the missing communication.

Parental involvement and level of communication may also be influenced by the use of e-diaries and how they are used, but this influence is different for different groups of parents and their access to technological resources. The utilisation of e-diaries could also have an impact on student engagement with the educational process by stimulating students' motivation to use technology and participate in classroom activities. However, if students from low socio-economic status families do not have access to technology, they may fall behind in their engagement with the learning process, and social inequalities may be transformed into educational ones through the influence of e-diaries.

In general, in schools with ensured and implemented access to electronic diaries, effective communication between parents, teachers and students (which takes place through various channels, including electronic diaries) and active participation of parents, students have higher educational results. Schools with high levels of parental involvement and effective communication tend to provide a more supportive learning environment as parents and teachers work together to address student needs and provide the necessary support. This can lead to improved student results and neutralisation of negative influences from existing social inequalities in the family environment.

Schools with limited access to technological resources and electronic diaries and distance learning platforms, with a lack of communication between parents and teachers and limited parental involvement in school life face challenges in providing the necessary level of support to their students. Students from low socio-economic status families fall behind in such schools, and this deepens existing social inequalities and leads to lower outcomes for students from these families.

Research has highlighted two interrelated dependencies. On the one hand, the dependence of inclusion in digital technology-based learning on the possession of certain resources, and more specifically on the availability of economic and cultural capital in families of different social status, was clearly emphasized. On the other hand, the use of electronic diaries in schools has been found to be a factor that affects social inequalities in several ways. Some of the effects are linked to the digital divide, as the use of e-diaries may increase the digital divide between students from low- and high-income families. In most cases, students from low-income families do not have quality access to the necessary technology and resources to use electronic diaries, while those from high-income families have access to the latest technology and resources. Accordingly, as a result of the introduction of electronic diaries, new types of digital inequalities are created in terms of access, use and benefits of new technologies, which can lead to the exclusion or limited inclusion of certain families from the educational process, and this creates an even greater imbalance in the educational field. Because e-diaries provide students with access to a wealth of information and educational resources, if students from low socio-economic status families do not have access to these resources, this may increase the achievement gap between different groups of students. Highlighting the described dependencies, the three analysed cases showed how the existence of significant social differences in terms of resources and individual types of capital, conditions the functioning of distance learning and e-diaries as a mechanism for transforming social inequalities into educational ones and thus legitimising them, and also for the emergence of new digital inequalities.

The conducted empirical studies clearly show several *key problems in our secondary schools*, related to:

- the ever-widening gap between the different schools in relation to socio-economic, transforming into educational inequalities;
- the level of participation and engagement of parents and students in the educational process;

- the ineffective usage of technologies in distance education.

The analysis of the day-to-day barriers to class attendance for specific groups of students shows that these problems are not simply individual or family related, but structural, rooted in the wider socio-economic environment. The issues of accessibility and inclusion in the educational process through electronic diaries are multifaceted and depend on a complex interaction between socio-economic status, cultural norms and power structures in the educational field. This requires comprehensive problem-solving strategies that address the root causes of educational inequalities and provide support tailored to the different needs of students and their families to ensure real, not just formal, equal access to education for all.

In some cases, the type of diary - be it electronic, paper or other form - does not attract the attention of certain students and families, because the main problem is not in the medium of communication, but in the value that these families place on the educational process. In such a context, efforts to improve engagement with education need to address the deeper reasons for the undervaluation of education by working to raise awareness of its long-term benefits and the ways in which it can increase both economic, as well as symbolic and social capital of families.

ICT can change the educational environment, but only if they are a part of a more comprehensive change of education, which also refers to its goals, content and methods. In this sense, the introduction of technologies cannot be an end in itself, which masks the problems instead of working to solve them, and the goal should be to make them an active participant and a means to achieve pedagogical goals, respectively their successful integration in an educational environment. To achieve change, electronic diaries should be implemented as a network together with various other technologies, including the "human actors", competent, motivated and prepared for the integration of ICT.

The theoretical and empirical analyses in the dissertation confirm the need expressed by many other authors, both in the media and among the general public, to reform our educational system so as to reduce the impact of socio-economic inequalities on the educational process, respectively to prevent the transformation of these inequalities into educational ones. Realising and turning this need from a slogan into a reality requires systematic, coordinated, strategically oriented and consistent policies, both in the field of education and in the overall socio-economic environment. All actors in the educational process should be actively involved and the possible role of technology should be completely rethought. This requires a focused effort to understand the needs and expectations of both students and teachers, as well as parents, and to develop more tailored engagement tools and practices.

The use of digital technologies - and in particular electronic diaries - should be subject to planning, achieving a shared understanding of the objectives and expected results, researching available and required resources and assessing needs, so that the process contributes to improving the quality of education and to help reduce the impact of socio-economic inequalities on it, rather than reinforcing them. With the emergence of new challenges, such as those caused by the COVID-19 pandemic, imposing a new (ab)normality and distance learning, digital technologies can help to implement a more effective, albeit "substitute" learning process, compared to the previous, but only on the condition that they are introduced on the basis of research and planning and are subject to follow-up evaluation of their effects and results from the point of view of clearly formulated goals of the educational process.

The empirical studies conducted once again confirmed the role of parents as an important actor in the educational field, in which different networks can be built, and not just as a passive outside observer. Therefore, when undertaking educational reforms and especially measures to increase the level of involvement of parents and students, their understanding of the educational process and the necessary changes in it should be taken into account, as well as their opinions on how they think they can be engaged and contribute to achieving a comprehensive and well-thought-out change in the education system.

Parental involvement in school life can have a serious impact on the educational process and its results. As analyses have shown that the use of electronic diaries in schools, where parents and students have limited access to technology, reproduces social inequalities and transforms them into educational ones, it is very important - both at school level and in the development of national policies – that these potential effects are taken into account and efforts should be made to mitigate and neutralise possible negative effects on students from families with a lower social status. This can be achieved by guaranteeing access to technological resources and conducting trainings in digital competences for families who do not have the necessary economic and cultural capital.

It is also important to point out that compared to the paper diary, no new type of functionalities have been established except for the communication function and distance learning platform that is integrated in Shkolo. The data shows that these functionalities are not used. In this regard, it is necessary to consider, and not only at the level of theoretical discussions, but also at the level of policy making, whether by themselves the inclusion of given individuals and social groups in education and the access to educational resources are

equivalent and automatically create equality of educational and social opportunities. If these processes are not accompanied by a change in the fundamental principles of organization of educational practices, they can have the exact opposite effect - create "conditions for new, subtler and invisible inequalities" (Маринова, 2019: 421). A comprehensive reform of education and of the school as an institution to ensure real inclusion and access to the various educational levels of children from the most economically and culturally disadvantaged families implies the elimination of "soft practices of exclusion", but also changes in " the economic and symbolic value of diplomas" (Бурдийо и Шампань, 1997: 24).

Electronic diaries are an element of the new (ab)normality, introduced in education before the pandemic, but continued its influence during distance learning. It should be kept in mind that it is not electronic diaries that create this new (ab)normality but they represent one of the many non-human actors in the learning process. The distance learning platforms integrated in them are not widely used because they have their drawbacks, and therefore do not have a significant impact on the educational process. The COVID-19 pandemic has forced the replacement of the learning process as a network, built on the basis of face-to-face relationships, with distance education (in some cases asynchronous) based on the construction of a network in which both human and non-human actors participate. However, this does not yet lead to a new understanding of "normality" that includes new technologies as an obligatory element of it. For the main actors in the educational field - teachers and students - this type of learning remains categorised as rather ineffective, but often also as "abnormal"/"unnatural", from the point of view of the aims of education, which include both the transmission of knowledge and the formation of the personality of adolescents and their growth both as professionals and as active citizens.

As it was already noted above, the analyses allowed to draw the conclusion that if national policies and policies and practices at the level of a specific school do not contribute to increasing the limited economic, cultural and technical capital of low-status families, digital technologies (and electronic diaries) actually become a mechanism for transforming social inequalities into educational ones. However, it is very important to add that only at first glance it seems that providing access to and skills in the use of digital technologies for all students and parents, regardless of their social background and status, is a task whose solution is the sole responsibility of the education system. Sociological analysis shows that this is deceptive and that the implementation of reforms and innovations in the educational system, which improve the quality of education and do not reproduce social inequalities, is possible only when they

are accompanied by adequate and long-term changes in all spheres of society (especially in the economic and social one).

Scientific and scientific-applied contributions

1. On a theoretical level, the transformation of digital technologies into an important factor in the educational process is understood and the interrelationship between digital technologies and social and educational inequalities is conceptualized.
2. The heuristic potential and limitations of basic concepts in the actor-network theory are outlined, with a view to their applicability for the study of digital technologies in social spheres, such as modern Bulgarian education, characterized by significant social inequalities and hierarchical relations.
3. The thesis that technologies are not autonomous and socially neutral non-human actors in the educational field is defended: the way of their (non)integration in the educational process depends on the existing differences in the social status of students and the related inequalities in their and their families' resources and also on policies at national and institutional level.
4. It is argued that in the circumstances of existence of significant social inequalities, ICTs in education function as a mechanism for transforming social inequalities into educational ones and thus legitimising them, as well as creating new digital inequalities.
5. The existence of technical capital is revealed and conclusions are drawn regarding its influence on the educational process.
6. On the basis of research conducted independently by the author, empirical facts have been established that show how inequalities between students, related to differences in the social status of their families, affect: a) access to education, b) control over students by parents and teachers , c) communication between teachers, parents, students and principals.
7. The conclusion is drawn that the possibility of the introduction of digital technologies (and more specifically of electronic diaries) in the educational field to cause a change in it, including in terms of the reduction of existing educational inequalities, suggests that it should be considered not simply as a formal technological innovation, but as part of a more comprehensive transformation of education in terms of its goals and relations between actors in it and taking into account the presence of social inequalities between students' families.

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