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Editorial

The Editorial Board of International Journal of Research in E-learning (IJREL) is privileged to present a new volume 8(2) 2022. The content of the current issue was divided into three chapters. The first is devoted to Research on Distance, Online and Blended Learning in Particular in the COVID-19 Time. The second contains articles concerned with Innovative Methods and Technology in Education. The third concerns Theoretical, Methodological and Practical Aspects and Psychological Determinants of ICT and E-Learning in Education.

The first part of the volume, Chapter I entitled "Research on Distance, Online and Blended Learning in Particular in the Pandemic Time of COVID-19", contains three articles.

Jarosław Krajka from Poland elaborated the article titled "Online Teacher Training for Global Teaching Contexts". The paper put to test the research hypothesis that using social professional networks, composed of participants who are familiar to one another outside the course but become new personas inside it, will have a positive effect on the involvement of teacher trainees in pursuing teaching qualifications, evidenced in their increased participation in methodology-oriented tasks in different modes, during the pandemic period. This is illustrated with examples from the Foreign Language Teaching Methodology online course for undergraduate applied linguistics students which blended synchronous and asynchronous interactions in different Moodle activities.

The second article prepared by Ineta Luka from Latvia presents an Implementation of a Multilingual Blended Learning Course for Non-formal and Informal Adult Learning During the Covid-19 Pandemic. The author described the current research, conducted in six EU countries – Croatia, Latvia, Slovenia, Romania, Poland, and Czechia, evaluates the suitability of the LMS to non-formal and informal adult learning for various target groups when face-to-face adult education was restricted. The research involved 638 participants, 209 of them were learners with barriers to learning. The participants studied the blended learning course created for non-formal and informal adult learning and filled in a feedback

questionnaire after its acquisition. The results indicate overall learner satisfaction with the LMS and the course delivery, and the suitability of the LMS for regular adult learners and learners with cultural, social, and geographic barriers to learning both for non-formal and informal learning.

The authors from Spain, Triana Arias Abelaira, Belén Mozo Redondo, present a study on Labour Relations and Human Resources students' perceptions of their training in digital competences. The main aim of this research is to determine the level of acquisition of digital competence in Labour Relations and Human Resources students. The second purpose is to check whether there is a link between gender and digital competence achievement. This paper is based on the application of a questionnaire on digital competences which is organized around 5 aspects, and mainly based on the basis of Likert-type scale questions. The data collected belong to 26 undergraduates studying at the third year of Degree in Labour Relations and Human Resources at the University of Extremadura. The results obtained show that a large majority of students (65.4%) have an advanced level of digital competence, nevertheless, it would be advisable for the rest to achieve the same level before they graduate and exercise their profession. The second important conclusion is that the level of acquisition of digital competence is not conditioned by gender aspects.

Chapter II, referred to as "Methods and Technology in Education", consists of two texts. The study on World Practices of STEM Education Implementation: Current Problems and Results was written by authors from Ukraine, Artem Yurchenko, Kateryna Yurchenko, Olha Naboka, Volodymyr Proshkin, Olena Semenikhina. A quantitative analysis of the results of the implementation of STEM education, presented in scientific publications, was carried out. A small percentage of publications dedicated to STEM education were found. It has been established that in countries with developed economies there are significantly more published scientific results regarding the implementation of STEM education. Practical cases of the implementation of STEM education in Ukraine and the world are highlighted. Among these are the organization of STEM education through solving problem situations in field conditions; holding classes on solving practical tasks in a certain professional field; examples of organizing and conducting lessons in high school on an interdisciplinary basis; cases for four scenario exercises; cases for solving practice-oriented tasks at home; cases of inclusive education using STEM projects. A content analysis of modern practices of implementing STEM education on open educational resources such as Coursera, edX, Udemy, Prometheus, and EdEra was conducted.

The article "Distance Learning at the Level of Primary Education: Parents' Opinions and Reflections" prepared by Marzena Wysocka-Narewska from Poland. The paper aims to show the advantages and disadvantages of distance education during the COVID-19 lockdown at the primary level, the emphasis being placed upon, among others, the teacher–student and student–student relationships, the infrastructure and skills required for a lesson, as well as some "food for thought" in

the form of possible changes and areas of improvement to be introduced suggested by the sample. The data comes from the questionnaire distributed among 60 parents of first graders.

Chapter III titled „Theoretical, Methodological and Practical Aspects and Psychological determinants of ICT and E-Learning in Education" includes three articles.

The first article devoted Learning Technologies for People with Mild Intellectual Disabilities was prepared by Alina Katarzyna Betlej, Alina Danileviča. The research focuses on the issue of learning technologies for people with mild intellectual disabilities. The analysis carried out is grounded in the theses of the network society. The initial objectives addressed three main issues: analysis of risks of digital exclusion of people with mild intellectual disabilities in highly technological developed societies; a conceptual view of learning technologies as tools to support social inclusion; and the importance of creating accessible e-learning environments to support inclusive e-education for people with mild intellectual disabilities. The authors used the analytical and descriptive method on the basis of the chosen literature sources to draw the conceptual view of functions of learning technologies in network society.

Agnieszka Muchacka-Cymerman, Katarzyna Tomaszek presents the manuscript titled "Students' Burnout in the E-School Environment: Pilot Study Results of the Validation of the E-learning Burnout Scale". The aim of this research was to investigate the appropriateness of using an E-learning burnout scale with an adolescent population. The E-Learning Burnout Scale (E-SBS) was designed specifically for measuring exhaustion and learning difficulties caused by school closures during the COVID-19 pandemic. E-learning burnout syndrome, which is defined as the five-dimensional construct, captures thoughts, feelings, and behaviours related to educational difficulties experienced by adolescent students during online classes. The results confirmed the E-SBS to be psychometrically sound regarding the five-factor structure, content validity, and discriminative validity. Hence, the E-SBS scale has shown potential for use in a variety of educational areas.

"Analysis of the Needs of Social Workers Regarding Their Utilization of ICT in the System of Provision of Social Services" is presented by Tetiana Liakh, Tetiana Spirina, Alina Dulia, and Ruslan Horchynskyi from Ukraine. The authors stressed that the using of information and communication technologies (ICT) is an important element in the work of social workers. A social worker must be able to use information and computer technologies both for self-development in the professional sphere and for organizing their daily practical activities and solving socially significant problems. Therefore, it is necessary to form and develop ICT competence in professional activities for the quality provision of social services. The purpose of the study is to determine the ICT tools used in the practical work of social workers in the provision of social services, the scope of ICT application,

and the analysis of the needs of social workers in Kyiv regarding the introduction of ICT into the system of providing social services.

We hope that studies and solutions in the present IJREL volume will be inspiring and encourage reflection on how to manage the increasing demand for online education in the current situation.

Eugenia Smyrnova-Trybulska
https://orcid.org/0000-0003-1227-014X

I. Research on Distance, Online and Blended Learning in Particular in the Pandemic Time of COVID-19

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Jarosław Krajka
Maria Curie-Skłodowska University, Poland
https://orcid.org/0000-0002-4172-9960

Online Teacher Training for Global Teaching Contexts – Can E-learning Help Develop Better Language Teachers?

Abstract

During the two-year pandemic period all university education, including language teacher training, was conducted exclusively in the online mode. While for many instructional contexts transition to the online mode meant decreasing the effectiveness of instruction due to lack of physical contact and greater time consumption for materials development, it became clear that skillful use of e-learning tools and procedures might give university education a boost. The paper will put to test the research hypothesis that using social professional networks, composed of participants who are familiar to one another outside the course but become new personas inside it, will have a positive effect on the involvement of teacher trainees in pursuing teaching qualifications, evidenced in their increased participation in methodology-oriented tasks in different modes. This will be illustrated with examples from the Foreign Language Teaching Methodology online course for undergraduate applied linguistics students which blended synchronous and asynchronous interactions in different Moodle activities.

K e y w o r d s: online professional development; pandemic emergency teaching; learner autonomy; online learning platforms

While e-learning methods and techniques had been in use in teacher training, including language teacher preparation, since the beginning of the 2000s, it was only with the university lockdowns caused by COVID-19 pandemic that the whole

training had to be moved to the online mode. Many instructors tried to imitate the well-established instructional approaches used before in face-to-face classrooms, however, these attempts proved largely inefficient due to lack of students' adequate responses, their connectivity problems, limitations of most popular online platforms such as Google Classroom or Microsoft Teams, or greater consumption of time needed to accomplish tasks and prepare digital materials. An alternative approach, investigated in the current study, was the blend of online synchronous and online asynchronous work, individual student-teacher and group student-students interaction, all skillfully merged and administered via the sophisticated features of Moodle Learning Management System.

The purpose of the paper will be to report upon a study which aimed at examining a blended synchronous/asynchronous and individual/group approach to acquisition of teaching competence based on Moodle LMS. Originally, the proposed methodology was Initially a pandemic emergency solution, however, it was continued also after the pandemic restrictions have been lifted due to potential for increasing students' exposure to materials, enhancing their teaching skills and deepening pedagogical reflection.

Literature Review

Electronic Professional Development of Teachers

If language teachers are supposed to teach their digitally native learners in an attractive and motivating way, they need to be trained not only in the skills necessary to actively and productively participate in interaction but also in those that would enable them to use the target language in online contexts (Satar and Akcan 2018). Therefore, it is essential to conduct professional development in technology-rich contexts as a way of experiential modelling (Hoven 2006), so that future teachers become convinced and ready to teach with technology in the (near) future.

At the same time, since online tools and platforms can be highly versatile, electronic continued professional development (e-CPD) opens up new instructional areas and creates appropriate conditions for the acquisition of professional skills in situated and collaborative settings (Son 2000). Rather than only based on one-way trainer-trainees delivery, varied modes of interaction and creation of professional social networks make a significant contribution to teacher development through interactive communication, professional collaboration and critical reflection (Son 2000).

Since participation in traditional training events often demands a considerable investment of time and money as well as reorganization of work and life schedules,

online professional developments have become popular with those teachers whose time and distance limitations together with family commitments prevent them from taking part in more traditional forms of training (Medina Garriguez et al. 2019). As argued by McDonald (2018), an even more important goal of e-CPD than developing certain teacher skills is to make them an active part of a virtual professional learning community (see also Thomas 2011).

e-CPD training programmes, especially those administered in the online mode, need to be characterized by embedding experiential activities in the programme, clearly structuring tasks which are appropriate to the tool/s and which follow a clear sequence starting with ice-breaker and proceeding to closure (Ernest et al., 2013). As Ernest et al. add, it is essential that ground rules for participation and precise course timelines are established, training in unfamiliar tools is provided prior to the project and moderating by teachers is offered according to commonly agreed principles.

As Douglas-Faraci (2010) proved, professional development offered through e-learning needs to be aligned with domains of quality instruction as defined by professional standards, while a variety of multimedia resources are needed to differentiate instruction and support participant understanding of course content. Since multimodality enables differentiated instruction, individual learning styles of teacher trainees can be accommodated together with a variety of technologies and interactional patterns used.

However, as Doliner and Nazarov (2021) warn, it is problematic to create an ideal e-learning professional development course since trainees have different initial training, interests, and motivations. What can be done, though, is design learning environments in such a way that a fairly high level of self-learning is present, that participants are encouraged to apply higher-order analysis and critical thinking and that time management problems are successfully handled to ensure successful completion of the course. Content-wise, as Doliner and Nazarov (2021) advocate, key parameters for effective e-CPD courses are open character of the system enabling evaluation of the content, practice, teachers' work, and student activities; compliance by teachers and developers with all the requirements set for the created materials; correlation between the theoretical and practical part of the course to ensure its practice-oriented nature, use of varied and well-selected tests, flexibility to modify course content and delivery based on trainees' comments.

Distance, Blended and Flipped Models of Language Teacher Development

As previous literature shows, online professional development of language teachers comes in many forms, ranging from fully distance, asynchronous, self-study courses through mixed-mode ones in which synchronous sessions are intertwined with asynchronous activities to flipped models, where the use of self-study and teacher-guided tasks is conditioned by the kinds of cognitive operations necessitated by these tasks. Online instructional approaches, used in

professional development courses, utilize not only basic synchronous/asynchronous distinction, but also written materials, live or pre-recorded webinars, high-fidelity simulated environments or video annotations (Webb et al. 2017). Asynchronous distance professional development can support extended discussion, reflection over the content of materials, individual preparation of teaching materials, which is particularly useful if participants come from different time zones.

As opposed to fully distance models, blended (or hybrid) PD programmes integrate face-to-face and online components in varying proportions and ways depending on the needs of participants. The online component in blended learning design can be either synchronous or asynchronous, where particularly the former has important learning benefits for teacher training and language education as it provides opportunities for face-to-face speaking and listening practice (Mackenzie et al. 2011). In the physical setting, this could be an instructional lab with tables and chairs in the centre of the room, surrounded by computer workstations (Hinkelman, 2005; Hanson-Smith, 2007), although nowadays especially tertiary institutions operate much more in the Bring Your Own Device (BYOD) paradigm.

There are various models of blended learning (Staker and Horn, 2012): "the rotation model, the flex model, the self-blend model, and the enriched virtual model" (p. 2). Rotation models assume that participants change between learning modalities, either at the teacher's will or according to a fixed schedule, where at least one is online learning, supplemented by individual paper-based assignments, conventional instruction (in small groups or full class) and individual tutoring. As opposed to rotation models, flex models give the students more individual freedom since the content is delivered online, but students are free to follow an individually-shaped schedule between learning modalities. Self-blend models offer students an even greater choice and freedom in that they follow one or more online courses to supplement their traditional courses (Staker & Horn, 2012). Finally, the enriched virtual model is the one in which students will find the greatest autonomy by being allowed to spread the time at their own liking between face-to-face and online learning (Staker & Horn, 2012).

Even more importantly than choosing a particular model of a blended learning course, trainers and designers need to carefully think about what the blended learning model should be designed around as the success or failure of e-CPD will largely depend on the approach and content (Wittmann & Olivier, 2021). Here, Wittmann and Olivier recommend basing blended instruction on learning and dialogue (not on teaching content), with a constant shift of dependence and control so that fellow learners are also elevated to the role of facilitators for their peers.

As regards the supremacy of blended professional development models over both face-to-face and fully online ones, a longitudinal study spread over the period of two years by Ranjan (2020) proved that the average achievement scores of the blended learning mode were higher than the online learning mode, while the presence of interaction of the instructor and other learners was responsible for better

performance of blended learning. However, in blended electronic professional development much depends on the methodology behind the blend, which comprises the choice of activities, the interaction patterns, the roles assumed by teachers and assigned to learners, rather than merely the transfer of part of the instruction to the online mode.

Local Community of Inquiry Teacher Development Model

As Kurek and Müller-Hartmann (2019) show, blended training contexts are much more effective when they employ the telecollaborative concept for the online part of the blend, as well as follow the social-constructivist principle of learning, which emerges from learners' participation in meaningful social activities and which results in the formation of a Community of Inquiry (COI – Anderson et al. 2001, Garrison, Anderson and Archer 2000, Hampel 2009). Such a community denotes "a group of individuals who collaboratively engage in purposeful critical discourse and reflection to construct personal meaning and confirm mutual understanding" (Garrison 2011: 2). In electronic professional development, a community of inquiry (CoI) is a collaborative-constructivist construct that integrates three elements (presences): (1) cognitive presence (CP), (2) social presence (SP), and (3) teaching presence (TP) (Garrison and Vaughan, 2012). Wittmann and Olivier (2019) specify that a CoI is formed when students are cognitively engaged with the content, their content-based contributions are supported and critically analyzed, while their proposed meanings are negotiated. Thus, discussions and questioning are a staple part of online activities, as they enable the teacher to track the participants' progress and help in refining their knowledge (Picciano, 2009). Hence, the inquiry in the CoI model is not only external, with fellow students via discussion forums or chats, but also internal, through dialoguing with oneself in private diaries.

The blended methodology adopted in the present study was creating a local (rather than global or telecollaborative) community of inquiry mediated via various modalities of online instruction. The local nature of the blend was due to that fact that the participants did know each other prior to the course, however, they interacted on a daily basis in the online mode only (due to COVID-19 university lockdown) in situations outside language teaching methodology. The experimental proposal draws from previous studies, first of all, Prestridge (2016), whose online professional development entailed teachers' building a network on their own with a personalized and self-directed approach to professional development, resulting in more independent operation of teachers, acknowledging the community and contributing to the generation of co-created knowledge (Prestridge 2016). In line with the development proposal of Impedovo and Malik (2019), the current blended training option was based on a non-expensive technical infrastructure, such as a free online learning environment like Moodle, open-source, community-expandable, mobile-friendly and founded on socio-constructionist philosophy that would maximise the expected psycho-pedagogical development of English

language teacher. At the same time, following the findings of the study by Truong and Murray (2019) contextualized in Vietnam, such problems of online teacher professional development (oTPD) as low confidence levels as regards technology use, absent or insufficient pre-course technical training and inadequate or unavailable technical support were minimized through the provision of tutorials in the use of the platform, weekly Q&A session about problems and instructor's readiness to address queries.

Methodology of Research

Research Objectives

The aim of the study was to examine the process of acquisition of professional teaching competence of pre-service teachers (student teachers of foreign languages) on the e-learning platform which blended synchronous and asynchronous as well as individual and group activities. The chief purpose was to verify the online blend instructional approach and see the development of student teachers' autonomy with limited contact with the instructor but a much greater amount of interaction with the peers.

Thus, the research hypothesis that was posed was the following: Embedding teacher training in social professional networks, composed of participants who are familiar to one another outside the course but become new personas inside it, will have a positive effect on the engagement of teacher trainees in pursuing teaching qualifications, as reflected in their increased participation in methodology-oriented tasks in different modes.

Sample of Research

The participants in the current study were 25 students (20 females and 5 males) of second-year of first-cycle programme of Applied Linguistics at a public middle-sized university in Poland. The participants volunteered to take up teacher training on top of their regular translation and interpretation specialization, which means they were highly motivated to participate in classes and gather knowledge and skills. Another source of motivation was that the teaching specialization had to be paid for. At the same time, however, the participants were under excessive workload pressure, as compared to their peers they took an additional 6–8 hours a week of teaching courses, 2 two-week practices over the year and 2–3 exams in each exam session. All of these circumstances called for special care as far as course requirements were concerned, without, however, compromising the quality of teacher training and negligence of state-regulated standards for teacher education.

Instruments, Procedures and Data Analysis

To verify the research hypothesis that participation in multimodal online teacher training course will have a beneficial effect on increased involvement in pursuing teaching qualifications, a small-scale quasi-experimental study was conducted. The participants were subjected to instructional intervention (multimodal Moodle-based course) and their perceptions about the experience were analysed after the treatment was completed through student satisfaction surveys and products made during the course.

Due to pandemic lockdown, all university education in the 2020/2021 academic year was conducted fully online. The present study was framed in the context of the Foreign Language Teaching Methodology (TEFL) preparation course conducted throughout both semesters. In the first semester, the topics comprised teaching language subsystems, while in the second one – teaching language skills, lesson planning and materials evaluation. However, the two semesters differed in the nature of interaction – since the first semester was only a 15-hour course, the instructional approach adopted was online synchronous tutoring with synchronous group tasks. Even though the online platform was used to support the training, it was limited to uploading instructional materials and tests as well as providing a virtual classroom for whole class and group tasks.

On the other hand, the second semester with double instructional time (30 hours) allowed for much greater flexibility, hence, a decision was made to design the course in such a way so that there is a blend of modes of work (synchronous and asynchronous), interaction patterns (teacher-whole class, student-teacher, student-students) and activities (mini-lecture, group work discussions, learning diaries, individual and group lesson development, and a number of others). Thus, the focus of instruction was purposefully shifted from real-time synchronous tutoring to asynchronous work in pairs, groups and on one's own based on materials provided by both the trainer and the other students.

The experimental course in question was designed on the university's Moodle, which, contrary to predominantly used Microsoft Teams, allows a much greater range of activities and interaction patterns, also designed in an adaptive way. The participants were familiar with Moodle as the classroom management system from other courses, which, however, did not exploit sophisticated activities and features to such an extent. The course was subdivided into 8 topics which were worked on in class and out of it for 3 weeks each. Each topic had a set of resources (audio, video, print, visuals, previous lesson plans, methodological criteria etc.) and activities (forums, diaries, assignments, polls). All were placed in a linear progression, with explanation to each module and sub-module clearly indicating the order and way of working as well as deadlines to be observed. Quite importantly, the participants were made aware that the deadlines had to be strictly complied with as the tasks were structured in such a way that the previous ones fed those to follow with ideas/materials/input. A screenshot from the course can be found in Figure 1 below.

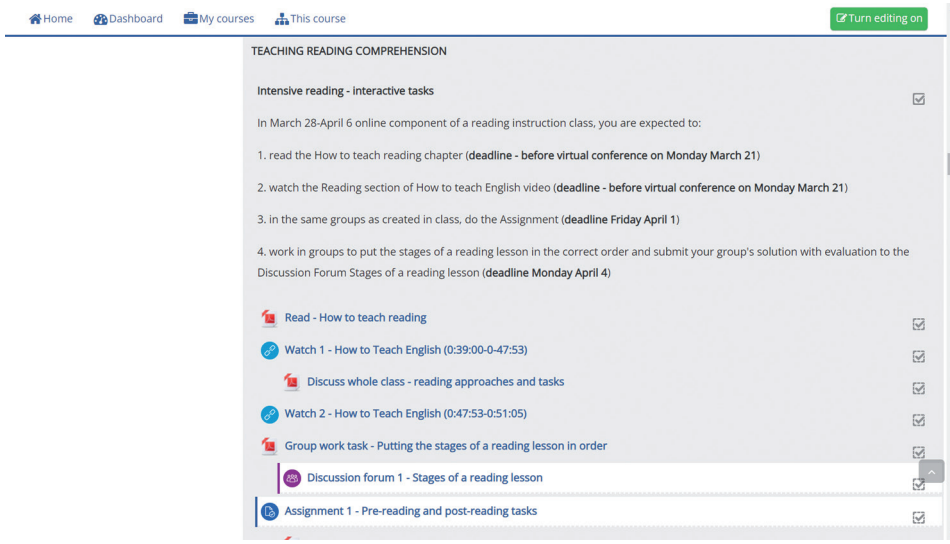

Figure 1. Online Professional Development Course based on Moodle

S o u r c e: Author's own work (UMCS Moodle course "Foreign Language Teaching Methodology, Jarosław Krajka, https://kampus.umcs.pl/course/view.php?id=698)

As indicated in Figure 1 representing the first module of the course, the planned intervention brought together textual, video and graphic resources in the form of readings, lesson recordings, classroom materials or discussion forum interactions with activities putting those into work either individually, in pairs or bigger groups. The kinds of activities used were, most importantly:

1. Forum – used for teacher trainees to upload encountered problems and others to suggest viable solutions;
2. Wiki – a collaborative space needed for group work on teaching materials (lesson plans, worksheets for students, sets of graphics for in-class presentation) pertaining to the topics raised in class;
3. Diary – a form of individual private communication between particular student teachers and the trainer used to deepen reflection on particular aspects of foreign language teaching methodology and for the trainer to provide well-directed individualized feedback;
4. Assignment – the final activity of each module, where no teacher guidance was provided to participants, aiming at verifying to what extent student teachers mastered the contents of the module, focusing on the practical side of materials development, adaptation and evaluation.

Examples of activities can be found in Figures 2 and 3 below.

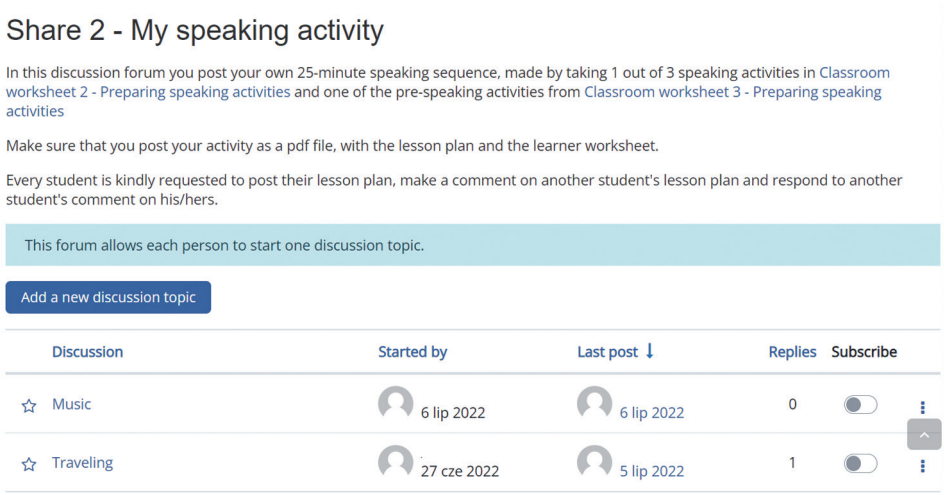

Figure 2. Online Collaborative Activity

S o u r c e: Author's own work (UMCS Moodle course "Foreign Language Teaching Methodology, Jarosław Krajka, https://kampus.umcs.pl/course/view.php?id=698)

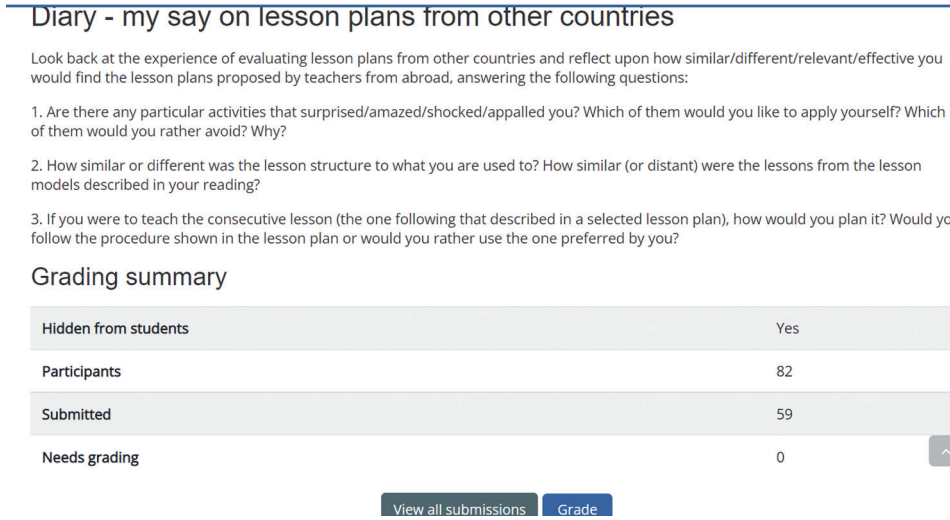

Figure 3. Internal Dialoguing in Private Diaries

S o u r c e: Author's own work (UMCS Moodle course "Foreign Language Teaching Methodology, Jarosław Krajka, https://kampus.umcs.pl/course/view.php?id=698)

The data collection techniques used to verify the applicability of the instructional procedure were, on the one hand, student feedback and satisfaction survey (conducted as a part of university-wide quality assurance scheme) and, on

the other, students' products (lesson plans and activities produced in response to the assignments). Indirectly, data were also gathered in some diaries, which, among the questions posed, featured also those trying to elicit participants' opinions on the experimental procedure. Hopefully, such an approach with multitude viewpoints allowed necessary triangulation and enabled verification of data.

Results of Research

The first source of data helping to verify the assumption that the use of blended fully online teacher development course would prove effective in the build-up of teacher skills was the student course satisfaction survey, completed as a part of the university-wide quality assurance system. Even though not completed by all participants (university-wide class evaluation surveys can have a low response rate, as low as even 5 or 10%), due to its anonymity and prestige it is a valuable source of feedback on the instructional procedures used in class. This means that they have to be supplemented with additional feedback instruments, such as own instructor surveys and group discussions, which, however, are no longer anonymous and may yield biased data if the researcher is the students' examiner at the same time. This was the reason why such additional tools were not employed in the current study.

Here, since study participants were explicitly explained the need for data and the purpose of the study, the response rate was higher, amounting to 60%, though the sample was still low and not allowing wider generalizations. Students expressed their high satisfaction with all aspects of the course, most situated between 5.50 and 6 in the 1–6 point scale. Especially high evaluation was expressed as regards suitability of didactic materials (5.67), contribution of the class to the respondents' set of knowledge and skills (5.67), easiness of contact with the instructor (5.67) and compliance with assessment rules and regulations (6.00). Equally high, though slightly lower assessment of the suitability of forms of work in relation to the taught concepts (5.33) calls for more reflection on the choice of activities, the balance of synchronous/asynchronous or individual/group ones in the overall course setup.

On a slightly more negative side, though, the lowest satisfaction score (5.00 in the 1-6 point scale, with the average of 5.56) was recorded in reference to the support provided by the trainer in execution of tasks. Indeed, much effort was devoted to assisting students in using the platform's functionalities, uploading materials, solving tasks on the technical side. On the other hand, it was on purpose that students had to work independently on the very tasks, and these were only assessed once submitted at the end of the semester. While they could inquire and clarify issues with the instructor, no partial assessment or feedback on assignments

was given throughout the semester. This most probably influenced the low assessment of this aspect of the instructional methodology.

As regards quantitative data, few participants actually went for the option of introducing qualitative comments. However, two are quite notable, and, quite interestingly, they lie on the two opposite sides of the feedback scale. On the one hand, one participant remarked that "The class was highly interesting, as was the assessment scheme. I particularly like the fact that we can use the materials created by ourselves and other students in our future work."

However, at the same time, the comment "I find the course interesting, however, even though it was an additional specialty, preparation for them took more time than for all other classes together." expressed the opposite assessment of the course. Especially the latter comment calls for more considerate specification of assignments, especially those more elaborate ones which used both individual and group work in their different phases. The instructor needs to remember how much more time it takes for students to perform fully online tasks as opposed to those done for the face-to-face class (even when prepared electronically).

One more source of data were the students' products, most importantly authoring lesson plans, sets of classroom materials and evaluations of other students' works. When compared with the same kinds of products produced by the same participants during the first semester of the course, the one which was delivered online in a more traditional (synchronous) mode without extensive use of varied interactive tasks on the platform, the students' products produced during the study clearly showed greater confidence, pedagogical sensitivity and creativity. However, the improved quality of materials might have been the result of overall increased teaching competence, which was contributed to by exposure to instruction in a few other courses apart from the one in question.

Discussion

The results of the present study indicated the validity of the online professional development model for language teachers, in which fully online instruction contains a blend of synchronous and asynchronous, group and individual interactional events. Skilful use of affordances of Moodle Learning Management System, such as forums (graded and ungraded), assignments (individual and group), polls (anonymous and named), collaborative co-construal and sharing of materials, video annotation, gave trainees enhanced instructional experience that enabled deepening their professional competence.

What is crucial, the variety of interaction patterns and involvement of other participants in feedback and assessment of student-made products led to the

emergence of a professional social network, which can be efficiently continued after graduation in Facebook groups for teachers or Massive Open Online Courses (MOOCs). This is in line with the finding of Truong and Murray (2019), who noted that underutilization of collaborative online tools, together with negative and demotivating feelings of insecurity and isolation, may undermine the effectiveness of the online mode of teacher development. Even though the context for their study was Vietnam while for the current one was Poland, the same effect of collaborative online tools to prevent isolation and insecurity was noticed.

Going away from the bright side and looking at some of the problematic issues raised by the participants in their feedback survey, it becomes evident how important the design of the course and the realistic estimation of trainees' capacity is for the success of the online professional development event. Clearly, even though great care was placed to ensure variety, interest, multimodality of materials, since the TEFL module was an add-on aside the regular translation and interpretation training, some participants felt discomfort about excessive workload it involved. These findings confirm those of a Malaysian study of e-TPD (Razak and Yusop 2013), where even though e-CPD seemed to be an ideal alternative to current face-to-face CPD, it had to be carefully designed and closely monitored by the CPD administrators and/or organizers. It is the participants' feelings of comfort in the electronic professional development course which influence the ultimate success to a much greater extent than deficient technical skills or technological hurdles.

As an influential study by Ernest et al. (2013) proved, the students who were most successful learners online were the ones who worked asynchronously via the Forum to plan collaboration and reach decisions regarding content, while they later used the real-time Elluminate meetings to confirm these decisions and distribute tasks. The current study corroborates Ernest et al.'s findings in that the variability of interaction patterns, from group to pairs and individuals, all designed in the Moodle LMS, increases motivation and fosters learning. Similarly, the emergence of such problems as possible negative attitudes of some learners towards online collaborative work, low levels of engagement, or the presence of one or two highly dominating students calls for trainers to encourage groups to agree upon their own ground rules for involvement in the activity while at the same time imposing a clear policy for online participation in the trainer's assessment.

Conclusion

While COVID-19 had a terrible effect on human lives in a great number of ways, paradoxically, it might have inspired educators to come up with innovative methodologies that could resolve some of the problems of online teaching such

as student isolation, passivity, limited response opportunities, to name just a few. The blended multiple-interaction instructional design used in the study aimed at exploiting the strengths of the lockdown situation, maximise the affordances of the sophisticated Learning Management Systems while minimising some of the negative effects of online learning.

However, as indicated by both quantitative and qualitative data, sophisticated computer-based instructional designs have to be used cautiously. The present research confirmed the assumption of Pineda and Celis (2018: 26), who concluded on the basis of the evaluation of online teacher development programmes in Colombia that "the rhetoric hegemonic that the internet-connected computer became a supposed best practice that can be imported and implemented in all kinds of areas, locations in the curriculum, types and numbers of students and teachers" have to be distanced from. Thus, there is a need for educators to be more sensitive to the needs of their students, be disciplined to follow the stipulated academic load and be aware of theoretical foundation of online programs.

Obviously, the study has some limitations which limit its generalizability. Most importantly, the sampling strategy was purposive, there was no possibility for the experimental/control group design. This is because, sadly, the number of teacher trainees in pre-service teacher development in Polish universities is becoming smaller and smaller, and outside very few teaching-only English study programmes it is not possible to design and implement research in two parallel groups (experimental and control). However, one option in such a case, possible for implementation in future research, would be the rotation of the nature of the same group, with intervention introduced for 1-2 modules (experimental group), withdrawn for another 2 modules (control group), then introduced again. Another limitation is that the findings from a small group are not always amenable to statistical processing and qualitative data analysis is needed to reach conclusions instead. This is, obviously, prone to researcher bias, especially if the trainer and researcher were the same person. This particular limitation could be eliminated by distinguishing the personas of trainer and researcher, which, unfortunately, was not possible in the very context of the present study since the researcher was the only trainer qualified to provide foreign language methodology instruction in TEFL.

Still, the viability of a multiple-interaction instructional model in electronic professional development of language teachers seems to be quite strongly justified, based on the qualitative data obtained. While the COVID-19 emergency remote instruction had its strong impact (in many cases, unfortunately, negative), the blended model with multiple interaction patterns realized online despite face-to-face contact seems worth promoting and continuing even while the pandemic restrictions have been lifted.

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Jarosław Krajka

Kształcenie nauczycieli na odległość do celów globalnego nauczania – czy e-learning może pomóc przygotować lepszych nauczycieli języków obcych?

S t r e s z c z e n i e

Podczas dwuletniego okresu pandemii COVID-19 całość kształcenia uniwersyteckiego, w tym kształcenia nauczycieli języków obcych, prowadzone było wyłącznie online. O ile w wielu przypadkach zmiana trybu pracy na nauczanie zdalne oznaczała spadek efektywności kształcenia z uwagi na brak kontaktu fizycznego i większą ilość czasu potrzebną do przygotowania materiałów na zajęciach, o tyle okazało się, że umiejętne zastosowanie narzędzi i metod e-learnigu może znacząco zwiększyć efekty uzyskiwane podczas procesu kształcenia nauczycieli. Celem artykułu jest pokazanie, jak zmaksymalizować skuteczność kształcenia kompetencji zawodowej nauczycieli języków obcych poprzez umiejętne połączenie synchronicznych i asynchronicznych zadań wykonywanych na platformie e-learningowej.

S ł o w a k l u c z o w e: doskonalenie zawodowe na odległość; zdalne nauczanie w czasach pandemii; autonomia ucznia; platformy e-learningowe

Ярослав Крайка

Дистанционное обучение учителей в целях глобального образования – может ли e-learning помочь подготовить лучших учителей иностранных языков?

Р е з ю м е

В течение двухлетнего периода пандемии COVID-19 университетское образование, включая обучение учителей иностранных языков, осуществлялось исключительно в режиме онлайн. Хотя во многих случаях переход на дистанционное обучение означал снижение эффективности обучения из-за отсутствия физического контакта и увеличения количества времени, необходимого для подготовки материалов для занятий, оказалось, что умелое использование инструментов и методов электронного обучения может значительно повысить результаты, получаемые в процессе обучения учителей. Цель данной статьи - показать, как можно максимально повысить эффективность процесса формирования профессиональной компетентности учителей иностранных языков с помощью умелого сочетания синхронных и асинхронных заданий, выполняемых на электронной образовательной платформе.

К л ю ч е в ы е с л о в а: дистанционное повышение квалификации; дистанционное обучение во время пандемии; автономия учащегося; образовательные платформы для электронного обучения

Jarosław Krajka

Formación de profesores a distancia para el aprendizaje global: ¿puede e-learning ayudar a preparar mejores profesores de idiomas?

R e s u m e n

Durante el período de dos años de la pandemia de COVID-19, toda la educación universitaria, incluida la formación de profesores de idiomas, se llevó a cabo exclusivamente en línea. Si bien en muchos casos el cambio de modalidad de trabajo a aprendizaje a distancia significó una disminución en la efectividad de la educación debido a la falta de contacto físico y más tiempo necesario para preparar materiales en las clases, al mismo tiempo resultó que el uso hábil de herramientas y métodos de e-learning puede aumentar significativamente los efectos obtenidos durante el proceso de formación docente. El objetivo del artículo es mostrar cómo maximizar la efectividad de la educación en competencias profesionales de los profesores de lenguas extranjeras a través de una hábil combinación de tareas sincrónicas y asincrónicas realizadas en la plataforma e-learning.

P a l a b r a s c l a v e: desarrollo profesional a distancia; aprendizaje a distancia en tiempos de pandemia; autonomía del alumno; plataformas e-learning

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Ineta Luka
Turiba University, Latvia
https://orcid.org/0000-0003-4706-1663

Implementation of a Multilingual Blended Learning Course for Non-formal and Informal Adult Learning during the COVID-19 Pandemic

Abstract

Due to the COVID19 pandemic, traditional face-to-face learning was replaced by distance education, e-learning, online learning and blended learning at all education levels, including adult education. Learning Management Systems (LMS) are crucial in organising an efficient pedagogical process online and ensuring that learners attain learning outcomes. The current research, conducted in six EU countries – Croatia, Latvia, Slovenia, Romania, Poland, and Czechia, evaluates the suitability of the LMS to non-formal and informal adult learning for various target groups when face-to-face adult education was restricted. The research involved 638 participants, 209 of them were learners with barriers to learning. The participants studied the blended learning course created for non-formal and informal adult learning and filled in a feedback questionnaire after its acquisition. The results indicate overall learner satisfaction with the LMS and the course delivery, and the suitability of the LMS for regular adult learners and learners with cultural, social, and geographic barriers to learning both for non-formal and informal learning. The LMS is suitable for learners with economic obstacles for non-formal learning. However, learners with learning difficulties require special pedagogical approaches to support them to acquire the course in an online-only blended learning format.

K e y w o r d s: blended learning, Learning Management System (LMS), adult learners, learners with barriers, non-formal education, informal learning

Although distance education, remote teaching, online teaching/learning, e-learning, blended learning (BL) are not new approaches in adult pedagogy, they have become even more popular recently (Wiliamson et al., 2020) due to a significant increase in online learning by adults during the COVID-19 crisis. 'Much of the training that had started as face-to-face on classroom environments has been pushed online' (OECD, 2020c, p.1). Learning online, including BL, turned out to be a viable option for involving adult learners in learning activities in the given situation.

Historically, BL became popular at the beginning of the 21st century when educational institutions started combining online teaching/learning with face-to--face onsite teaching/learning (Rasheed et al., 2021). It was also successfully used for various adult education courses prior to the COVID-19 pandemic (Cocquyt et al., 2019).

Due to its flexibility and cost-effectiveness, BL is considered an effective mode of instruction (Rasheed et al., 2021) that supports traditional forms of teaching (Tang et al., 2020). Its flexible and personalized curricula respond to student diversity (Bruggeman et al., 2021) and students 'may have a control over some elements such as time, place, and path of learning' (Ropero-Padilla et al., 2021, p.2). Furthermore, technology integration in BL courses facilitates students' interaction on online group projects, case studies and debates, thereby resulting in better attained learning outcomes (Gjestvang et al., 2021). However, due to the flexibility of BL, students spend relatively little time on performing tasks and therefore complain about missing collaboration with groupmates in a natural setting (Gjestvang et al., 2021).

Prior research on BL courses for adult learners focuses on learner engagement and satisfaction with the course design and implementation (Gao et al., 2020), which is essential both for face-to-face and technological environments to ensure an effective BL process (Chiu, 2021). Some studies analyse domestic and community barriers to learning caused by the COVID-19 pandemic highlighting technological, financial and pedagogical barriers (Habibi et al., 2021). Research conducted in Poland (Zajdel et al., 2021; Gorecka et al., 2021) highlight health issues experienced by teachers and learners as a result of extended periods of time spent in front of computer screens.

At the same time, other studies highlight certain advantages of learning online as well. Levpušček & Uršic (2021) stress that teaching/learning online enables incorporating various quizzes, videos, electronic presentations in lectures, which engage students in the learning process. Learners can access the learning content at any time and any place.

The fact that learning may take place anywhere, using any devices means it is ubiquitous learning. It is suitable to adult learners, especially those with geographic, social, and economic barriers to learning. This is in line with 'the concept of flexibility' defined in the recent Eurydice report (European Commission/

EACEA/Eurydice, 2021) wherein flexibility 'implies a greater choice in terms of time, place, pace, content and mode of learning' (ibid, p.95) which is especially significant for adults with barriers to education. The recently adopted *CONFINTEA VII* finds BL to be an 'effective means of reaching out to marginalized people and communities most in need of ALE', i.e., adult learning and education (UNESCO, 2022a, p.9).

Adult learning is a key component of lifelong learning, and it refers to all education levels, spaces and learning modalities – formal, non-formal and informal (UNESCO, 2022a, p.2). This article will analyse the LMS of the BL course created and implemented for non-formal and informal adult learning.

Non-formal adult education in this research is perceived as 'organized and systematized learning, conducted outside formal education which amplifies it, providing acquisition of knowledge and skills, necessary for economically and socially active citizens of the country' (Ogienko & Tereko, 2018, p.170) that ensures 'well-being of the adult population through offering possibilities for personal growth, lifelong learning and participation' (Nivala et al., 2021, p.3). Participation in non-formal adult education is voluntary (Hanemann, 2021). Informal adult learning takes place in various settings such as culture, work, social media, the Internet etc., enabling adults to enrich themselves (UNESCO, 2022b). It is seamless learning which leads to an increase in learners' capacity – improved knowledge, developed skills, broadened experience, etc.

Experience gained during the 'new normal' by education institutions worldwide indicates that online/blended learning will remain popular among adult learners in the future as well (Zajdel et al., 2021).

Problem of Research

Although prior research on applying BL in adult education during the COVID-19 pandemic exists, most of it refers to formal education. The evaluation of *Learning Management System* (LMS) and BL course implementation for various target groups of adult learners, including learners with barriers to learning, when real face-to-face meetings were restricted, is an insufficiently researched topic.

Research Focus

This research was conducted among six partner countries – Croatia, Latvia, Slovenia, Romania, Poland, and Czechia, within the Erasmus+ project "Cultural knowledge and language competences as a means to develop 21st century skills" (Project No.2018-1-HR-01-KA204-047430; 2018-2021). The aim of the project was to foster adult learners' 21st century skills and broaden their knowledge of the rich European intangible cultural heritage thereby enhancing their overall development and employability.

The aim of this paper is to evaluate the suitability of the LMS chosen for the implementation of a BL course for non-formal and informal adult learning for

various target groups in these six partner countries during the COVID-19 pandemic, when novel ways had to be found to implement the BL course.

Course Description

The "European Culture-Based Multilingual Blended Learning Course" for adult learners comprises 18 modules in ten languages (English, Croatian, Czech, French, German, Hungarian, Latvian, Polish, Romanian, and Slovenian) and reflects the culture of each partner country in three comprehensive modules in these ten languages. The methodological approach to the course is depicted in Figure 1.

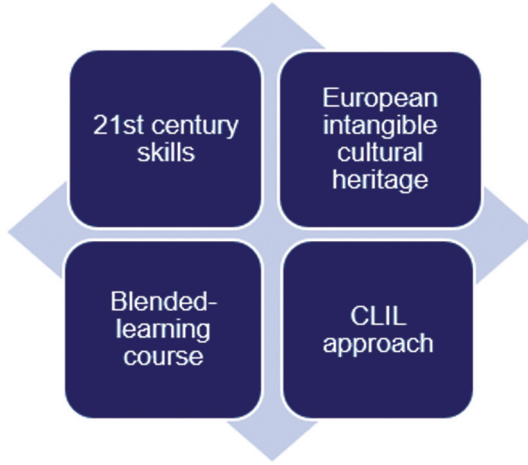

Figure 1. The methodological approach

Source: Own work

The CLIL (Content and Language Integrated Learning) methodology was applied to ensure simultaneous acquisition of both the course content and the target language (Marsh, 2002; Stevie, 2018). A story reflecting the rich European intangible cultural heritage forms the basis of each module and innovative teaching/learning methodologies and tools, such as webquests, case studies, vialogues, videos, audios, design thinking tools, interactive games, etc. have been used. In this research BL has been defined as 'learning facilitated by effectively combining different modes of delivery, models of teaching, and styles of learning' (Heinze & Procter, 2004, p.2) wherein interactive and problem-based face-to-face activities have been integrated into online learning to enhance the learners' 21st century skills.

A BL approach, comprising online and face-to-face stages, has been applied to provide a wide range of adult learners the opportunity to acquire cultural knowledge and develop 21st century skills at their own speed and convenience by selecting the most appropriate mode of learning for them – informal, non-formal or formal.

The course concept, its creation and methodologies as well as the specificity of adult learners have been analysed in prior research by the author (cf. Luka, 2019a; Luka, 2019b; Luka, 2021; Luka, 2022).

The course participants differ in terms of age, education level and occupational status, and some have barriers to learning (geographic, economic, cultural, social, and educational) as well.

Each module starts with online and/or face-to-face warm-up tasks leading up the main theme that presents the relevant cultural information. Face-to-face tasks (30-40%) have been combined with online tasks (60-70%) flexibly. Solutions to problem situations are suggested at the end of each module or open-ended questions are posed to stimulate further discussions. Thus, learners acquire cultural knowledge on the relevant theme and develop 21st century skills, as they progress through each module from the beginning to the end. The detailed curricula in each of the ten languages are available on the LMS (e-culture.eu, 2022).

Due to the COVID-19 restrictions, face-to-face stage was implemented partly in class and partly on virtual learning platforms. The online stage was implemented on the designed Moodle LMS.

Learning Management System

'The learning environment is emphasized as a central component of the learning process' (Gjestvang et al., 2021, p.75). This refers both to traditional teaching/learning in the classroom and to all forms of learning online.

Technology-supported learning environments in education have been researched for more than 20 years (Müller & Wulf, 2021). In the late 1990s, higher education institutions started using LMS, for example, BlackBoard designed in 1997, to support students' learning. Nowadays 'LMS have become sophisticated platforms to support synchronous and asynchronous interactions' (Bryson & Andres, 2020, p.611), but their main functions remain the same: 'a) provision and organization of content; b) course management, including attendance, assessment, grade management and announcements, and c) communication tools' (ibid.).

Dobre (2015, p.314) divides LMSs into three groups: open-source LMSs, proprietary/commercial LMSs and cloud-based LMSs. In any type of LMS, interaction between people and system is ensured through electronic (in the current

research: computer, smartphone, tablet) and virtual means (in this research: Internet and videoconferencing applications).

Prior research on LMSs for online learning/BL concludes that LMSs must be user friendly (Hofmeister & Pilz, 2020), useful and playful generating student interest in the learning process and engaging learners in interaction (Gao et al., 2020). They must be convenient and innovative (Patra et al., 2021) enabling teachers to apply various teaching/learning methods and 'properly disseminate information and knowledge' (Roman & Plopeanu, 2020, p.4). They must provide synchronous and asynchronous learning activities (Rucsanda et al., 2021), enable 'combining recorded videos and live courses with greater online interaction' (Ionescu et al., 2020, p.3), consider students' learning styles and technological experience as well as include 'relevant and authentic assignments, and appropriate tools and technology' (Carrillo & Flores, 2020, p.474). They must also incorporate socio-emotional elements that enable learners feel the social presence (Dascalu et al., 2021) – one of the main challenges in learning online. Furthermore, they must comply with the learners' needs and expectations, and provide constant feedback to learners.

The assignments of the course focus on everyday situations in authentic environments, and include interactive elements. This approach is in line with the integrated approach by Carrillo & Flores (2020).

A user-friendly LMS 'should be a combination of pedagogical, social and technical parts' (Shi et al., 2021, p.2). To support student engagement, the LMS has to fulfil the three innate psychological needs of learners – the need for autonomy, the need for relatedness and the need for competence (Chiu, 2021). The need for autonomy involves flexibility and making one's own learning path, relatedness refers to experiencing the sense of belongingness to the group, and competence relates to professional and personal growth of learners. This points to the necessity of creating such a LMS that would enable using various teaching/learning methods (pedagogical component), engage learners in interaction (social component), secure the implementation of the learning process, and support learners in attaining their learning outcomes (technological component).

One of the most popular open-source LMSs, used in educational institutions worldwide, is the modular object-oriented dynamic learning environment (Moodle) (Silva & Souza, 2016; Lebeaux et al., 2020; Rawat et al., 2020). Launched on 20th August 2002, it currently has 328 million users, 1.899 billion enrolments, and 41 million courses in 244 countries comprising 356 million resources (Moodle, 2022). Due to the minimal costs and technical parameters, Moodle is a frequently used LMS for BL courses. One of its main advantages is the possibility of organizing teaching/learning material in modules, which is very convenient and easy to understand even for inexperienced learners (Rawat et al., 2020). Therefore, it was also one of the main LMSs used in many countries during the COVID-19 pandemic (Tomczyk, 2021; Rimkuvienė et al., 2021; Zajdel et al., 2021). Additionally, MS

Teams, Zoom, Cisco WebEx, Google Meet were often used for a synchronous communication with students. Moodle was used as the learning platform for the online learning stage of the target course (e-culture.eu, 2022) and the partners chose one of the above-mentioned synchronous communication channels for the face-to-face stage of learning.

Since technologies are changing, BL is changing as well (Prokhorets et al., 2015). Currently, the face-to-face stage is often implemented in an online synchronous mode using various virtual platforms and other technological means, instead of real-class meetings. Bryson & Andres (2020) call this transfer of BL to complete online learning with no real face-to-face meetings *online-only blended learning* wherein the 'LMS platform provides a resource repository to support engagement with online material, and real-time online learning encounters replace classroom-based teaching' (p.613). Thus, the role of LMSs is increasing.

Methodology of Research

Research Design

The current research applies a comparative research design to analyse the results more in-depth and carry out systematic interpretation (Boeren, 2019) by comparing the results among different countries and learner groups to evaluate the suitability of the LMS for course acquisition by various groups of adult learners in non-formal and informal education.

Sample of Research

Since the course has been planned for a wide group of adult learners, purposive sampling (Walliman, 2016) was used, which involved a broad range of adult learners of all ages, education levels and occupational status, and learners with geographic, economic, social, cultural, and educational barriers to learning. It was planned to attract 100 learners per country. However, since the Croatian partner did not succeed in involving the required number of learners, other partners invited more learners. In total, 638 learners participated in the research. Their profile is as follows:

- Participants' country: 83 learners (13.01%) were from Croatia, 111 (17.40%) – from Latvia, 122 (19.12%) – from Poland, 111 (17.40%) – from Romania, 104 (16.30%) – from Slovenia, and 107 (16.77%) – from Czechia.
- Gender: 228 male (35.74%) and 410 female (64.26%).
- Age: 272 respondents (42.63%) were aged 18-24, 73 respondents (11.44%) – aged 25–34, 55 (8.62%) – aged 35–44, 89 (13.95%) – aged 45–54, 60 (9.40%) – aged 55–65 and 88 (13.79%) were 65 and older.

- Education level: 38 (5.96%) had basic education, 231 (36.21%) – secondary education, 43 (6.74%) – vocational education, 50 (7.84%) – college education, 144 (22.57%) – Bachelor level education, 112 (17.55%) – Master level education, 19 (29.78%) – PhD level education.
- Occupational status: 271 (42.48%) were students, 226 (35.42%) – employees, 40 (6.27%) – employers, 39 (6.11%) – retired, 26 (4.08%) were not employed and 36 (5.64%) had not indicated their occupational status.
- 1/3 of the course participants, namely, 209 (32.76%) out of 638, were learners with barriers to learning: 67 learners had cultural and social barriers to learning, 73 – geographic barriers, 41 – economic obstacles to learning and 28 learners were with learning difficulties requiring special educational treatment.
- Technological capabilities: the majority of respondents used some technological devices on a daily basis (Table 1).

Table 1
Frequency of using technological devices on a daily basis, %

The usage	Technological devices		
	PC/Laptop	Smartphones	Tablets
More than 20 hours a week	50.8	64.9	4.7
Less than 20 hours a week	24.3	20.4	9.1
Few hours a week	14.7	11.1	16.1
Never/almost never	10.2	3.1	69.4
No data	0	0.5	0.6

S o u r c e: Own work

Instrument and Procedure

The research was conducted from March 2020 to January 2021. The course participants selected modules according to their interests and filled in the course evaluation questionnaire after the course. Constant pedagogical and technological support was provided by teachers during course acquisition through specially organised workshops and consultations.

A paper-based questionnaire of three parts: 1) socio-demographic data on participants, 2) evaluation of the LMS, the module content and the development of learners' 21st century skills (all 5-point Likert scale questions), 3) evaluation of learners' learning styles was used. Cronbach's Alpha reliability test shows a very good reliability and consistency among the variables under analysis ($\alpha = 0.924$). In this paper the author analyses the evaluation of the LMS based on the learners' profiles.

Data Analysis

IBM SPSS Statistics 23 software was applied to analyse the data employing descriptive statistics, Cronbach's Alpha reliability test, and inferential statistics tests to discover significant differences among countries and target groups.

Research Ethics

The norms and standards of research ethics were observed ensuring the participants' anonymity, their voluntary participation in the research, causing no physical or psychological harm to them and securing protections against harm (Brancati, 2018). The participants were informed about the research purpose, data collection, analysis and presentation of the results prior to administering the questionnaire.

Results of Research

The findings indicate that, overall, learners were satisfied with the LMS. The majority of learners *strongly agree* or *agree* with the evaluation criteria (Figure 2).

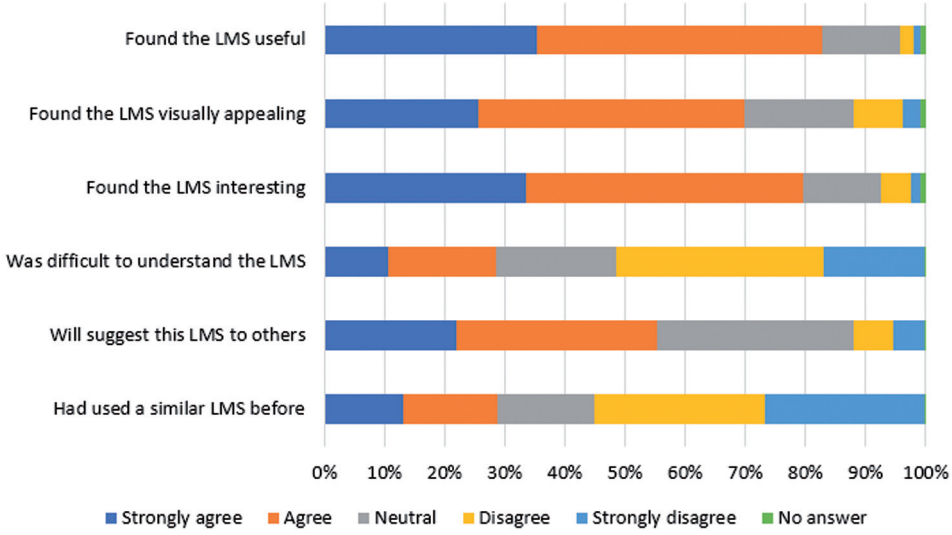

Figure 2. Evaluation of the LMS by all learners, %

S o u r c e: Own work

528 learners (82.76%) found the LMS useful, 446 (69.91%) found it visually appealing and 508 (79.62%) – interesting. 326 learners (51.09%) admitted that it was not difficult to understand how the LMS works, and 128 learners (20.06%) were neutral. However, 182 learners (28.53%) experienced problems in using the LMS. 353 learners (55.33%) would suggest it to other learners and 208 (32.6%) were neutral. Thus, it may be concluded that overall, the given LMS has the characteristics required for a user-friendly LMS (Roman & Plopeanu, 2020), but certain groups of learners require more assistance during studies.

Next, the results of each individual country are presented.

Croatian respondents positively evaluated the LMS (M = 3.3133–3.9036). As the majority had not used a similar LMS before (M = 2.8916), they found the LMS a bit complicated (M = 2.7952), but, nevertheless, useful (M = 3.9036), visually appealing (M = 3.5783), interesting (M = 3.6145), and they would suggest it to other learners (M = 3.3133). Other research conducted in Croatia on learning during the COVID-19 pandemic (Puljak et al., 2020) indicated that learners had sufficient IT skills to participate in online learning independently (84.7%) and they had technological possibilities as well. As Divjak (2020) explains, Croatia particularly focused on developing students' and teachers' digital skills in their curricular reform of education in 2016-2017 which was extremely beneficial during the pandemic period both for teachers and students, including adult learners.

Although Czech learners had not used a similar LMS before (M = 2.2897), they evaluated it very positively (M = 3.3458-4.4486). They found the LMS useful (M = 4.3458), interesting (M = 4.4486), visually appealing (M = 3.9346), and it did not take them too much time to understand how it works. They were inclined to suggest it to other learners as well (M = 3.9252). Prior research (Bobáková & Chylková, 2021) on Czech adult learners' digital skills shows a steady increase during the last decade resulting in 27% of adult learners being able to master 5–6 digital skills in 2017. It is evident that learners were not complete beginners and could easily grasp new knowledge.

Although most of Latvian respondents had not used a similar LMS before (M = 2.8378), 51 learners (45.95%) learnt its operation fast. However, at the same time 29 learners (26.13%) experienced problems with the LMS. Learners found the LMS interesting (M = 4.0721), useful (M = 3.9640), and visually appealing (M = 3.8649). These results were opposite to results of other studies conducted in Latvia. Rimkuvienė et al. (2021) found that 62.0% of Latvian students reported problems with the LMS. They even recommended improvements to the interface of the Moodle system used. Furthermore, Trinkūnienė & Juškaite (2021) reported that 36.84% of Latvian and Lithuanian learners had insufficient digital skills.

72 Polish learners (59.02%) had not used a similar LMS before (M = 2.4836), which impacted their overall result. Although 58 learners (47.54%) found it difficult to understand how to use the LMS, they found it useful (M = 3.8852), visually appealing (M = 3.2787), and interesting (M = 3.5). However, they were neutral as

to suggesting the learning platform to other learners (M = 3.0246). The findings of a research conducted in Poland by Tomczyk (2021) also indicate that 1/3 of respondents reported difficulties in using the Moodle LMS. This emphasizes the necessity of having workshops introducing the LMS prior to course implementation. However, it has to be added that a part of Polish learners were learners requiring special educational treatment, which impacted this result.

Although only 43 learners (38.74%) from Romania *agreed* or *strongly agreed* that they had used a similar LMS before, they could understand how to use it quite fast (M = 2.4775). Overall, they positively evaluated the LMS (M = 4.0270–4.3964), acknowledging its usefulness (M =4 .3964) and indicating that it was interesting (M = 4.3694), visually appealing (M = 4.0270) and they would suggest it to other learners (M = 4). On the contrary, other studies in Romania (Ştefenel & Neagoş, 2020; Edu et al., 2021), indicated a low evaluation of learners' digital skills and LMS used as it overburdened students with work. Consequently, the learning outcomes were not achieved. Although the use of BL in teaching/learning was technologically feasible, it was not widely used in Romania prior to the COVID-19 pandemic.

Slovenian respondents gave a very positive evaluation of the LMS (M = 4.0577–4.1538). Respondents found the platform useful (M = 4.1538), interesting (M = 4.1058), visually appealing (M = 4.0577) and they would suggest it to other learners (M = 3.6923). Although learners had not used a similar platform before (M = 2.2596), answers to the opposite question – *it did not take them too long to understand the LMS*, were positive (Mean = 2.3846). Overall, Slovenia was much more prepared for online education than other countries. According to Motoh (2020), state support for distance learning was stable, including support provided to vulnerable groups, such as ethnic minorities and the less educated, who were one of the target groups of Slovenia.

Despite an overall positive evaluation of the LMS by learners of all countries, differences among respondents were discovered when the learner responses were compared with the average result. The LMS evaluation in Figure 3 is the average of three variables: *I found the LMS useful*, *I found the LMS interesting*, and *I found the LMS visually appealing*. User friendliness is reflected by the opposite question – *It took me too long to understand how the LMS works,* and therefore data for this variable has been reversed so that positive answers have a higher value.

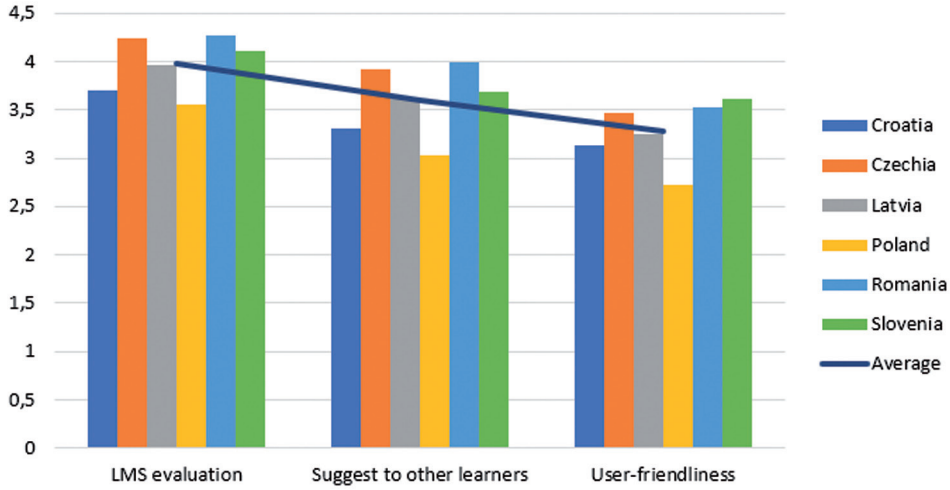

Figure 3. Evaluation of the LMS by respondents' country, means (max = 5).

Source: Own work

The Kruskal Wallis test indicated significant differences among the countries. Learners from Romania found the LMS significantly more useful and visually more appealing than learners from other countries, and they would more likely suggest the given LMS to other learners. This may be explained by the fact that a great majority of Romanian learners (68.47%) were students. Czech learners found the LMS more interesting than other learners. The learners' occupational status impacted this result. 57.94% of Czech learners were employed compared to 25.22–50.45% of learners from other countries. Employees found the LMS more interesting than other groups of learners. At the same time, they had not used a similar learning platform before, which could have influenced this result as well. In turn, Slovenian learners were more technically savvy and needed less time to understand platform navigation. This may be explained by the fact that the Slovenian target group comprised 44 students, including 20 IT students. Furthermore, significant differences were observed in terms of learners' education. Overall, the higher the learners' education level, the more positively they evaluated the LMS.

Comparing the data concerning learners with cultural, social, geographic and economic barriers to learning and senior learners requiring special educational treatment with regular adult learners, it is evident that learners with barriers to learning found the LMS more interesting than regular adult learners (Table 2).

Table 2
Evaluation of the LMS by respondents' category, means (max = 5)

Evaluation of the LMS	Respondents' category		
	Learners with barriers to learning	Regular learners	All learners together
Found the LMS useful	4.0335	4.1492	4.1113
Found the LMS visually appealing	3.7656	3.7972	3.7868
Found the LMS interesting	4.0622	4.0047	4.0235
Was difficult to understand the LMS	3.0766	2.5221	2.7038
Will suggest this LMS to others	3.4258	3.6783	3.5956
Had used a similar LMS before	2.2584	2.7599	2.5956

S o u r c e: Own work

Although the data seem quite similar, the Kruskal Wallis test applied shows significant differences among these groups in all aspects. Therefore, the data was further analysed in-depth considering each group of learners with barriers to learning to evaluate the suitability of the LMS to all target groups (Figure 4).

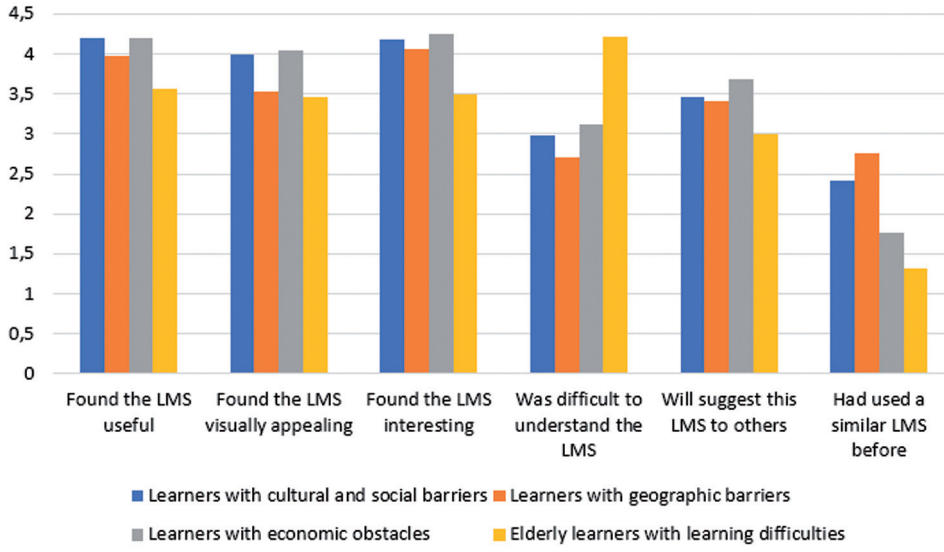

Figure 4. Evaluation of the LMS by learners with barriers to learning, means (max = 5)

S o u r c e: Own work

Learners with barriers to learning found the LMS significantly more interesting (Asymp.Sig.2-tailed = 0.000) than other adult learners. Among them, the highest evaluation was given by learners with economic, cultural and social barriers, and geographic barriers to learning.

The findings show that learners requiring special educational treatment needed significantly much more time to understand how the LMS works (Mean Rank = 512.93). This may be explained by the fact that very few of them had used a similar LMS before (Mean Rank = 140.43). They were also less willing to suggest the given LMS to other learners (Mean Rank = 236.07). The other group with low previous experience in using any LMS before was learners with economic obstacles (Mean Rank = 199.65), but, contrary to senior learners, they would suggest the LMS to other learners (Mean Rank = 342.48).

Thus, it may be concluded that the LMS under analysis is suitable both to learners with certain barriers to learning and regular adult learners for non-formal and informal learning as well. Since, elderly learners requiring special educational treatment need additional support, the LMS will not be suitable for them for informal learning.

Discussion

The target BL course was implemented both as a non-formal education course and for informal learning as well. First, learners were selected based on special requirements, as indicated in the sample description above. Next, where possible, learners were divided into groups. Prior to course implementation, face-to-face or online workshops were organised for learner groups to demonstrate the LMS. However, part of the course participants were individual learners who were studying the course as informal learning. These individual learners were reached by e-mails, skype, WhatsApp and through personal visits or other personal contacts to explain the LMS before they started studying.

When, owing to the COVID-19 pandemic, face-to-face meetings were restricted, novel ways had to be found to implement the target BL course. Thus, the face-to-face stage was implemented on other virtual platforms, such as MS Teams, Zoom, Google Meet, Cisco WebEx, etc. This made the learning process even more complicated as learners had to learn two learning platforms – Moodle for the online stage and the other virtual platform for the face-to-face stage. Slovenia was the only country where the course was implemented in the traditional BL format with real face-to-face sessions in class. The face-to-face stage in Croatia, Czechia, and Latvia was implemented partly in class and partly on virtual platforms, depending on the situation in the country. However, participation in face-to-face sessions in class was

quite limited even during periods when it was allowed, since people were afraid of assembling together. In Poland and Romania, the course was implemented as an online-only BL course. Thus, it was extremely challenging for teachers to explain to learners how the LMS works via online meetings, since many learners with barriers to learning also lacked digital skills. This had an impact on the research results. Other challenges concerned the course monitoring. Furthermore, when implementing the course solely online, the learning speed is slower as learner-learner and learner-teacher interaction takes more time using various platforms, and it is essential to consider the time devoted to each task.

Despite these above-mentioned challenges, learners showed interest in the target BL course. They were satisfied with the LMS created, and in some cases even suggested improvements to it.

Previous studies also highlight students' interest in improving the LMS. For example, Czech learners suggested 'including a combination of online presentations, exercises, videos, and interactive activities into online language teaching to make foreign language learning more stimulating' (Klimova, 2021, p.1792). The results of the current research are similar to this prior research.

Students also desired to do more group work and games that would ensure more interactivity in lessons. This leads to a conclusion that the course in a Moodle environment must be well structured and the tasks should be more engaging. This finding is in line with the results of a study by Rimkuviené et al. (2021).

The results are closely related with the readiness of the country to online learning in terms of teachers' and learners' digital skills and their previous experience in using different LMS. Although there are certain similarities among the countries, learners' digital competence level varies a lot. For example, 'in Slovenia, 80% of teachers "agreed" or "strongly agreed" that most teachers in the school were open to change' (OECD, 2020a, p.3) and their technological capacity was above the OECD average (ibid, p.5). In turn, the analysis of the situation in Poland, which showed the lowest results in evaluating the LMS, reveals that 'the access to the necessary digital devices is not equally distributed across the population' (OECD, 2020b, p.4), and it resulted in technical problems in online learning during the pandemic (Gorecka et al., 2021). Furthermore, as Olszewska (2020) argues, the negative evaluation of online learning may be attributed to psychological not technological barriers. In this case the results showed that face-to-face contacts would have helped learners with learning difficulties to understand technical nuances better.

Conclusion

The article presented the main findings of a research conducted in six European countries – Croatia, Czechia, Latvia, Poland, Slovenia, and Romania. It introduced readers to a culture-based multilingual BL course created to develop adult learners' 21st century skills implemented during the COVID-19 pandemic, when traditional face-to-face learning was restricted, and other alternatives were applied in this 'new normal' situation. This article analysed the learners' evaluation of the LMS.

The results show that learners were satisfied with the LMS created. Most of them admitted that although they had not used a similar LMS before, they could understand how to manage it quite easily. However, senior and technically less experienced learners required more help, and it would have been beneficial for them if they had had more face-to-face assistance during the learning period.

The results indicated that the level of learners' digital skills, education, occupation and previous learning experience impacted their overall satisfaction with the LMS. It may be concluded that despite differences between these countries, the target BL course may be applied to regular adult learners both for non-formal and informal learning. As regards to learners with barriers to learning, the course is suitable for learners with cultural, social, and geographic barriers, and may be used both for non-formal and informal education as the learners could cope with the LMS. Some learners with economic obstacles may succeed in learning in an informal way, but some experienced technical problems with the LMS. It is suggested to involve learners requiring special educational treatment in traditional non-formal learning instead of the BL format.

To conclude, the given BL format with the face-to-face stage conducted online (online-only BL course) requires special pedagogical approaches and very clear step-by-step instructions, and significant input from teachers and learners to attain the learning outcomes.

Limitations of Research and Implications for Future Research

The target course was designed in 2019 and was delivered to adult learners during the COVID-19 period. Since restrictions for face-to-face meetings were in force in the partner countries, it influenced the course delivery mode and results. The course was predominantly implemented as an online-only BL course, except for Slovenia, which was the only country where the course was implemented in the traditional BL format. The research results show the course implementation and evaluation in a specific situation. In the future, it will be useful to conduct similar

research in a traditional situation and elaborate guidelines for the course organisers to deliver a BL course to adult learners with certain barriers to learning to involve them in lifelong learning.

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Ineta Luka

Implementation of a Multilingual Blended Learning Course for Non-formal and Informal Adult Learning during the COVID-19 Pandemic

A b s t r a c t

Due to the COVID-19 pandemic, traditional face-to-face learning was replaced by distance education, e-learning, online learning and blended learning at all education levels, including adult education. Learning Management Systems (LMS) are crucial in organising an efficient pedagogical process online and ensuring that learners attain learning outcomes. The current research, conducted in six EU countries – Croatia, Latvia, Slovenia, Romania, Poland, and Czechia, evaluates the suitability of the LMS to non-formal and informal adult learning for various target groups when face-to-face adult education was restricted. The research involved 638 participants, 209 of them were learners with barriers to learning. The participants studied the blended learning course created for non-formal and informal adult learning and filled in a feedback questionnaire after its acquisition. The results indicate overall learner satisfaction with the LMS and the course delivery, and the suitability of the LMS for regular adult learners and learners with cultural, social, and geographic barriers to learning both for non-formal and informal learning. The LMS is suitable for learners with economic obstacles for non-formal learning. However, learners with learning difficulties require special pedagogical approaches to support them to acquire the course in an online-only blended learning format.

K e y w o r d s : b l e nded learning, Learning Management System (LMS), adult learners, learners with barriers, non-formal education, informal learning

Ineta Luka

Wdrożenie wielojęzycznego kursu blended learning dla pozaformalnego i nieformalnego uczenia się dorosłych podczas pandemii COVID-19

S t r e s z c z e n i e

W związku z pandemią COVID-19 tradycyjne nauczanie twarzą w twarz zostało zastąpione edukacją na odległość, e-learningiem, nauką online i edukacją mieszaną na wszystkich poziomach, w tym w nauczaniu dorosłych. Learning Management Systems (LMS) mają kluczowe znaczenie dla organizowania skutecznego procesu edukacyjnego online i zapewniania, że uczący się osiągają zakładane efekty uczenia się. Obecne badania, przeprowadzone w sześciu krajach UE: Chorwacji, Łotwie, Słowenii, Rumunii, Polsce i Czechach, określają przydatność platform LMS do pozaformalnego i nieformalnego uczenia się dorosłych w przypadku różnych grup docelowych, w sytuacji gdy kształcenie dorosłych w bezpośrednim kontakcie jest ograniczone. W badaniach wzięło udział 638 uczestników, w tym 209 osób z trudnościami w dostępie do nauki. Uczestnicy przestudiowali przygotowany kurs typu blended learning jako kurs edukacji pozaformalnej i nieformalnej oraz wypełnili ankietę ewaluacyjną po przyswojeniu treści kursu. Wyniki wskazują na ogólne zadowolenie uczących się z LMS i ze sposobu prowadzenia kursu oraz przydatności platform LMS dla potrzeb standardowych uczniów dorosłych oraz uczniów z kulturowymi, społecznymi i geograficznymi przeszkodami w uczeniu się zarówno w przypadku uczenia się pozaformalnego, jak i nieformalnego. LMS są odpowiednie dla uczniów z trudnościami ekonomicznymi w uczeniu się pozaformalnym, ale uczniowie z barierami w nauce wymagają specjalnego podejścia pedagogicznego, aby wesprzeć ich w przyswajaniu treści kursu w formacie nauczania mieszanego wyłącznie online.

S ł o w a k l u c z o w e: blended learning, Learning Management System (LMS), dorośli uczniowie, uczniowie ze specjalnymi potrzebami, edukacja pozaformalna, uczenie nieforrmalne

Translated by Aleksander Kobylarek, University of Wrocław, Poland

Ineta Luka

Implementación de un Curso de Aprendizaje Combinado Multilingüe para el Aprendizaje No formal e Informal de Adultos durante la Pandemia del COVID-19

R e s u m e n

Debido a la pandemia del COVID-19, el aprendizaje tradicional presencial fue reemplazado por la educación a distancia, formación a distancia, aprendizaje en línea y aprendizaje combinado en todos los niveles educativos, incluido la educación de adultos. El Sistema de Gestión de Aprendizaje (LMS en sus siglas inglesas) tiene una enorme importancia por la organización eficiente del proceso pedagógico en línea, así como la garantía por parte de los estudiantes de conseguir los resultados del aprendizaje. La investigación actual llevada a cabo en seis países de la Unión Europea: Croacia, Letonia, Eslovenia, Rumanía, Polonia y República Checa, evalúa la idoneidad del Sistema de Gestión del Aprendizaje (LMS) respecto al aprendizaje de adultos no formal e informal para varios grupos destinatarios, cuando la educación de adultos presencial está restringida. La investigación comprendió 638 participantes, 209 de ellos son estudiantes con ciertos obstáculos en el aprendizaje. Los participantes estudiaron el curso denominado aprendizaje combinado, como un curso no formal e

informal y un cuestionario de opiniones cumplimentado al término del curso. Los resultados indican la satisfacción total de los estudiantes con el LMS y la impartición del curso y la idoneidad del Sistema de Gestión del Aprendizaje para alumnos adultos comunes y alumnos con obstáculos culturales, sociales y geográficos en el aprendizaje no formal e informal. El LMS es apropiado para alumnos con dificultades económicas para el aprendizaje no formal, pero los alumnos con ciertos problemas en el aprendizaje requieren un enfoque pedagógico especial para ayudarles en la consecución del curso en un formato de aprendizaje combinado exclusivamente en línea.

T é r m i n o s c l a v es: aprendizaje combinado, Sistema de Gestión del Aprendizaje (LMS siglas en inglés), alumnos adultos, alumnos con barreras en el aprendizaje, educación no formal (educación no reglada), aprendizaje informal

Translated by Vicente Navas Mesa, Turiba University, Latvia

Инета Лука

Реализация многоязыкового курса смешанного типа обучения в области неформального образования и информального обучения для взрослых во время пандемии COVID-19

А н н о т а ц и я

В результате пандемии COVID-19 традиционное очное обучение было заменено дистанционным образованием, электронным обучением, онлайн обучением и смешанным обучением на всех уровнях образования, включая дополнительное образование для взрослых. Системы управления обучением (СУО, Learning Management Systems (LMS) крайне важны для организации эффективного педагогического процесса дистанционно и для обеспечения необходимых результатов у обучающихся. Данное исследование, которое проводилось в шести странах ЕС: Хорватия, Латвия, Словения, Румыния, Польша, Чехия, оценивает, насколько системы управления обучением подходят для неформального и информального обучению взрослых разных целевых групп в условиях, когда очное образование для взрослых ограничено. В исследовании приняло участие 638 человек, 209 из которых являются обучающимися с определёнными препятствиями в учебе. Участники прошли разработанный в рамках исследования курс смешанного обучения в виде неформального и информального обучения и по окончанию курса заполнили анкету обратной связи. Результаты исследования показывают общее удовлетворение участников системой управления обучения и тем, как преподавался курс. Исследование показало также соответствие системы СУО для типовых взрослых учащихся и для учащихся с разными сложностями (культурные, социальные и географические) используя как неформальный, так и информальный типы обучения. Система СУО подходит для обучающихся с экономическими сложностями в неформальном обучении, тогда как для работы с учащимися с другими сложностями в обучении необходимы особые педагогические подходы для преподавания курса только дистанционно с использованием смешанного типа обучения.

К л ю ч е в ы е с л о в а: смешанное обучение, система управления обучением (СУО), взрослые обучающиеся, учащиеся с определенными осложнениями, неформальное и информальное обучение

Translated by Valerija Drozdova, Turiba University, Latvia

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Triana Arias Abelaira
Universidad de Extremadura
http://orcid.org/0000-0002-4832-3058

Belén Mozo Redondo
Consejería de Educación y Empleo
http://orcid.org/0000-0002-1564-9262

Labour Relations and Human Resources: Students' Perceptions of Their Training in Digital Competences

Abstract

Nowadays, the acquisition of a high level of digital competence has become a real need for professional development in any field. Future graduates in Labour Relations and Human Resources should achieve an advanced level of this skill. The main aim of this research is to determine the level of acquisition of digital competence in Labour Relations and Human Resources students. The second purpose is to check whether there is a link between gender and digital competence achievement. This paper is based on the application of a questionnaire on digital competences which is organized around 5 aspects, and mainly based on the basis of Likert-type scale questions. The data collected belong to 26 undergraduates studying at the third year of Degree in Labour Relations and Human Resources at the University of Extremadura. The results obtained show that a large majority of students (65.4%) have an advanced level of digital competence, nevertheless, it would be advisable for the rest to achieve the same level before they graduate and exercise their profession. The second important conclusion is that the level of acquisition of digital competence is not conditioned by gender aspects.

K e y w o r d s: Digital competence, higher education, Labour Relations and Human Resources, competence assessment, gender perspective

Current society of the 21st century is in continuous technological change. Humankind has developed a global net regarding instant information transmission. It allows us to feel humanity in real time. We are immersed in what has been called Information Society. This society development must benefit human beings. Meanwhile, this development evolves in such a way that information and communication technologies (ICTs) produce new products and services and, therefore, new ways of managing organisations. In the end, we live in a digital society. The use of ICTs has increased due to COVID-19 pandemics. (Cucinotta & Vanelli, 2020). ICTs have mitigated devastating scenarios regarding every society sector: economics, politics, health and education (Guiot Limón, 2021).

Digital society needs competent people in technological and digital environments. The term "digital native" is commonly used to refer to people born in the digital era, after new technologies boom. However, according to the interview by Prensky & González Calatayud (2018), where Prensky, who is considered the author of the term, indicates that "rather, the terms Digital Natives and Digital Immigrants are a metaphor for many social changes that have taken place since the emergence of digital technology". Prensky asserts that both terms represent the huge cultural change seen from parents to children in current human society. At some point in the interview Prensky states that "digitally competent education" does not only mean that children (or teachers) use computers. It really means that children achieve more and more expertise in the use of computing and connecting so as to solve problems in a more efficient way, considering its enormous potential.

Some basic concepts to define digital natives are: a) Having been born after technology boom, b) Early accessibility, c) Digital education and d) Technological skills improvement. From these, "Digital education" has to do with the training received on technology, and with the use of digital tools to develop projects, improve learning and being in contact with online training. This goes far beyond that, and according to Aparici Marino & Silva (2012) crowds have become users that do not only share contents, but also create and produce them and, therefore, take on a role of authors-producers.

A direct consequence of digital education is digital competence (DC), which is key to learning that is appropriate for today's society (Alexander et al., 2019). For García (2021) DC is the one which implies the creative, critic and safe use of information and communication technologies, in order to achieve work-related objectives, employability, learning, the use of leisure time, and inclusion and participation in society. Plenty of studies have been carried out on DC in recent years; thus Lázaro-Cantabrana et al. (2019) have created and proved a tool to measure this competence. Cabero Almenara & Martínez Gimeno (2019) have analysed the problem of training DC regarding the skills teachers need to have in order to incorporate them into their teaching and professional practice. Besides, the European Union Framework for Digital Competence of Educators is very important

(Redecker, 2017) and so is the UNESCO[1] framework of ICTs competence for teachers (Butcher, 2019).

It is highly important to determine the level of DC of teachers in every education level, higher education being one of the most necessary, and certainly in all areas of knowledge. Thus, there are now a number of studies that can be cited as Rodríguez García et al. (2019). In the field of Social Sciences, we find Andres & Svoboda (2019) who indicate that teachers have a medium-high level of knowledge of technological tools, and for Mirete Ruiz (2016) there is a significant relationship between knowledge and the use of different technologies.

If we focus on future professionals in the area of Labour Relations and Human Resources, it is clear that they must develop the DC in order to be competitive in the development of their profession. According to Felisardo et al. (2019), the changes in current business models make it essential to have employees with extensive DC. For all of the above reasons, it is almost essential for higher education graduates to develop these competences before entering the world of work in a professional manner, as otherwise they would be at a disadvantage compared to candidates for job vacancies who have not developed the DC.

Objectives

The general objective of the experiment is to determine the level of digital competence of students on the Bachelor's Degree in Labour Relations and Human Resources. The specific objectives are to determine the level of digital competence in Technological Literacy, in Access to and Use of Information, in Communication and Collaboration, in Digital Citizenship and in Creativity and Innovation. The second objective of this research is to determine whether there is a relationship between the gender of the student and the level of digital competence.

Methodology

The research in this paper is based on the use of the validated Digital Competence questionnaire (Mengual-Andrés et al., 2016) called Cuestionario de Competencias Digitales en Educación Superior (CDES). CDES was developed by the EDUTIC[2]

[1] United Nations Educational, Scientific and Cultural Organization.
[2] Education and Information and Communication Technologies.

research group at the University of Alicante. This questionnaire has been used in multiple studies, most notably by Fan&Wang (2022) where it was applied to Chinese university students. Since a statistical analysis of numerically measurable and quantifiable data has been used, the focus of this study is quantitative.

Sample

The data for this research were collected from 26 students in the third year of the Degree in Labour Relations and Human Resources at the University of Extremadura (UEx). Of them 11 are men and 15 are women. These are the students who normally attend class and are in continuous assessment. The rest of the students of the degree are in final assessment, and do not attend class.

Instrument

The instrument used is the CDES questionnaire (Mengual-Andrés et al., 2016) which consists of five dimensions, namely:

- Technological literacy: students demonstrate an adequate understanding of ICTs concepts, systems and functioning.
- Information access and use: students apply digital tools to obtain, evaluate and use information.
- Communication and collaboration: students use digital media and environments to communicate and work collaboratively, even at a distance, to support individual learning and contribute to the learning of others.
- Digital Citizenship: students understand human, cultural and social issues related to ICTs and practice legal and ethical behaviours.
- Creativity and Innovation: students demonstrate creative thinking, construct knowledge and develop innovative products and processes using ICTs.

Data collection and analysis procedure

The CDES questionnaire was adapted to Google Forms (Palomares Chust, 2015) and then the teachers who teach in the third year of the different degrees of Labour Relations and Human Resources of the Faculty of Economics and Business Studies of the University of Extremadura were contacted. This guaranteed the availability and access to the questionnaire for their students. The e-mail detailed the objectives of the research, as well as the e-mail address where the on-line questionnaire could be accessed. Figure 1 shows an example of how students see the questions. In this case, we have used question A7 from the CDES questionnaire. This question belongs to the "Characteristic of the questionnaire".

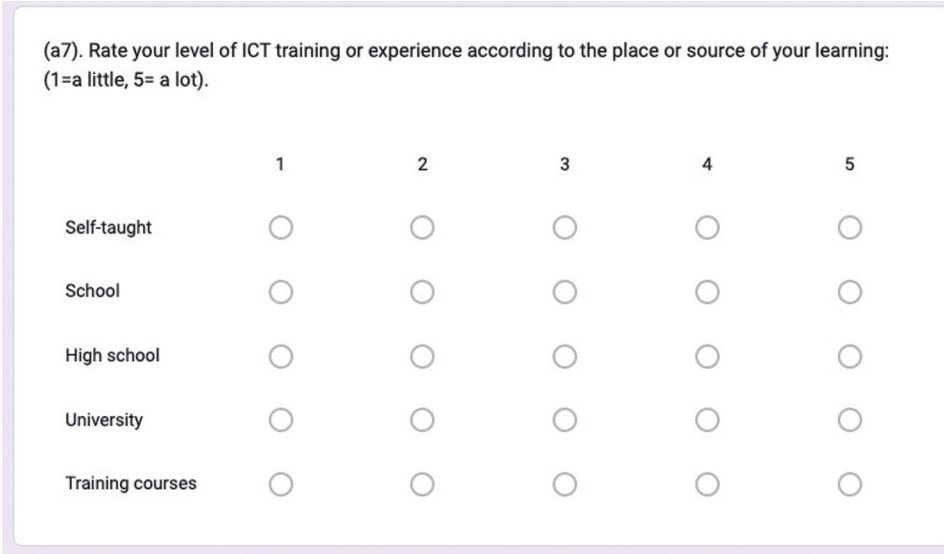

Figure 1. Example of the questionnaire question.

Source: Own work.

Internal consistency of questions

Since the instrument was already validated (Mengual-Andrés et al., 2016), the first thing to do is to demonstrate the internal consistency of the scores of the measurement instrument. Thus, it is necessary to combine the students' responses by adding their values and obtaining a total score for the instrument. However, in order to be able to group the questions into categories, it is necessary to demonstrate that there is an internal consistency between the questions and therefore it is correct to sum the results of the questions in order to define it as a total score. By doing this, it is possible to know that the scores of the sample are reliable from the point of view of the internal consistency of their answers. In short, it is a question of homogeneity between the questions that make up a dimension (Guix, 2005). One of the advantages of Cronbach's Alpha is the possibility of assessing how much the reliability of the test would improve (or worsen) if a certain item or question were excluded. According to George & Mallery (2019), recommendations for evaluating Cronbach's Alpha coefficients are as follows:

- Coefficient alpha >.9 to .95 is excellent.
- Coefficient alpha >.8 is good
- Coefficient alpha >.7 is acceptable
- Coefficient alpha > .6 is questionable
- Coefficient alpha >.5 is poor
- Coefficient alpha <.5 is unacceptable

Table 1 shows the full Cronbach's Alpha for the 48 questions of the CDES questionnaire corresponding to the 5 Dimensions. The value is 0.973, therefore, it has an "excellent" internal consistency. And according to Sánchez Meca & López Pina (2008) it can be said that "the reliability of the scale scores in the sample is 0.973". McDonald's Omega has also been calculated and the result is the same.

Table 1
Cronbach's alpha for the 48 questions of the CDES questionnair

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.973	.973	48

Source: Own work with SPSS from questionnaire data.

Component analysis

At present, there is still an open debate on whether to use Principal Component Analysis or Common Factor Analysis (Velicer & Jackson, 1990). However, the use of Component Analysis seems to predominate mainly because it is the default option in most statistical software, e.g. SPSS (Fabrigar et al., 1999). In this research this is also done and for all explorations it is concluded that none of the questions in any of the dimensions need to be eliminated.

Data coding

From the data collected in the Excel sheet that exports the Google Forms form, the data were imported into SPSS. The first step is the coding of the dimensions as defined in the CDES questionnaire. Figure 2 shows how the dimension "Technological Literacy" (Dimen_TL) is coded. First of all, the sum of all the questions of the dimension has to be totalled and then the totalled variable (Sum_TL) has to be re-coded in the corresponding Likert scale, in this case it will be "Di_TL". Since the dimension has 11 questions, the different cut-off values for each scale value are 11, 22, 33, 44 and 55, which will correspond to the values chosen by the students of 'Not at all important', 'Important', 'More or less important', 'Important' and 'Very important'. The same is done for the rest of the dimensions, which are coded as Dimen_IAU for the dimension 'Access to and use of information', Dimen_CC for the dimension 'Communication and collaboration', Dimen_DC for the dimension 'Digital citizenship' and Dimen_CI for the dimension 'Creativity and innovation'.

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DATASET ACTIVATE ConjuntoDatos1.
* Agrupación visual.
*Recodificar Suma_AT para la dimension "Alfabetización Tecnológica" (AT).
RECODE  Suma_AT (MISSING=COPY) (LO THRU 11=1) (LO THRU 22=2) (LO THRU 33=3) (LO THRU 44=4) (LO THRU
    HI=5) (ELSE=SYSMIS) INTO Di_AT.
VARIABLE LABELS  Di_AT 'Di_AT'.
FORMATS  Di_AT (F5.0).
VALUE LABELS  Di_AT 1 'Not at all important' 2 'Important' 3 'More or less important' 4 'Important' 5 'Very important'.

VARIABLE LEVEL  Di_AT (ORDINAL).
EXECUTE.
```

Figure 2. Example of the questionnaire question.

Source: Own work.

Categorisation of Digital Competence

In order to be able to assess the digital competence of students for one of the dimensions, the variable "Digital Competence" has to be categorised into levels of: advanced, intermediate and basic. For this purpose, the constant "K" is established, which serves as a reference value for determining the scales. This constant K is calculated as follows:

$$K = ((\text{NumberOfQuestions} * \text{MaxScore}) - \text{NumberOfQuestions})/3$$

Thus, for example, the Digital Competence in "Communication and Collaboration" which has 8 questions and each question is evaluated with a Likert scale with a value from 1 to 5, the constant K will be 10. The value of "basic" will be for those with a minimum range of 8 to a maximum of 17. The value of "intermediate" will be for the student whose minimum range is 18 to a maximum of 29. And finally, the value of "advanced" will be for ranges from 30 to 40.

The Global Digital Competence will be based on the 48 questions that add up to the total of the 5 dimensions, and therefore, the ranges will be from: 48-111 for "basic"; 112-176 for "intermediate" and 177-240 for "advanced".

Results

Once all the data collected from the CDES questionnaire have been categorised, we proceed to the analysis of the results. Firstly, the internal consistency of the dimensions is evaluated, followed by an overall analysis of the results and then a detailed analysis of each of the dimensions in order to achieve the objectives set. Finally, the gender independence of students' digital competence is analysed.

Internal consistency of dimensions

Table 2 shows Cronbach's Alpha for the 5 dimensions with a value of 0.912. This value is considered "excellent". And according to Sánchez Meca & López Pina (2008) it can be said that "the reliability of the scale scores in the sample is 0.912". McDonald's Omega has also been calculated and the result is very similar, namely 0.912.

Table 2
Cronbach's Alpha for the 5 dimensions of the CDES questionnaire

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.912	.914	5

S o u r c e: Own work with SPSS from questionnaire data.

Table 3 shows the different Cronbach's Alphas for each of the dimensions independently. When working with Cronbach's Alpha independently per dimension, only the deletion of the dimension "Communication and Collaboration" would change the Cronbach's Alpha from "good" to "excellent". However, since the level of "good" is very valid, we keep all dimensions.

Table 3
Cronbach's Alpha for each of the 5 dimensions of the CDES questionnaire

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Dimen_AT	16,96	6.598	.826	.882
Dimen_AUI	16.96	6.918	.732	.903
Dimen_CC	17.12	7.306	.711	.905
Dimen_CD	16.85	7.015	.798	.888
Dimen_CI	16.88	7.226	.831	.883

S o u r c e: Own work with SPSS from questionnaire data.

Overall analysis

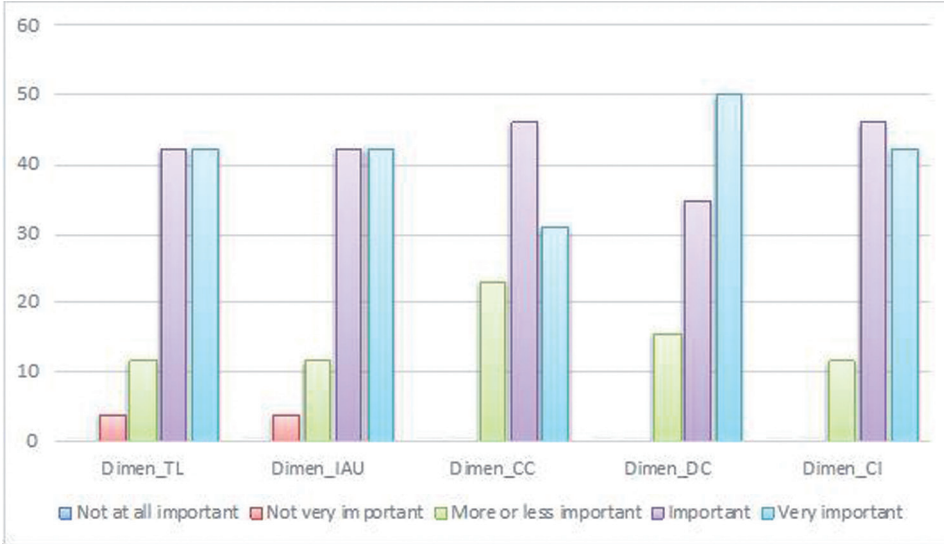

Figure 3. Percentage distribution of Likert scale values for each of the dimensions of the CDES questionnaire.

Source: Own work.

Figure 3 shows the percentages of each of the categories according to the Likert scale values in which they have been coded from the students' responses. No dimension has "not at all important" values. The value of "not very important" is given for the dimensions "Technological Literacy" and "Access to and use of Information" with 3.8% for both. The neutral value of "more or less important" is found in all five dimensions with values of 11.5% for the dimensions "Technological Literacy", "Access to and use of information" and "Digital Citizenship"; 23.1% for the dimension "Communication and Collaboration" and 15.4% for the dimension "Digital Citizenship".

If the values of "important" and "very important" are combined, only the dimension "Communication and Collaboration" has a little less than 80% (77.0%), while the rest of the dimensions have values above 84%.

Figure 4 shows the mean of each dimension. First of all, it can be noted that the average of the five dimensions is on the scale of "important" for all students. The two dimensions with the highest values are "Digital Citizenship" and "Creativity and Innovation" and the dimension with the lowest values is "Communication and Collaboration".

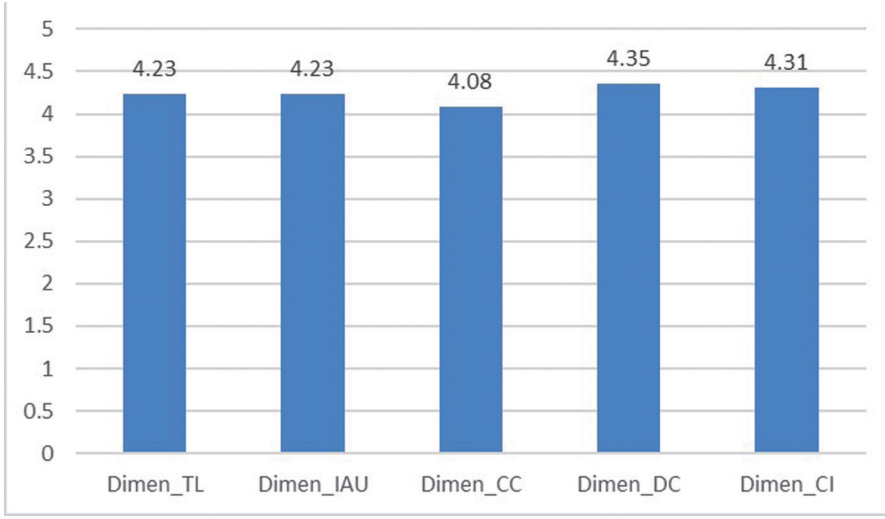

Figure 4. Mean of each dimension of the CDES questionnaire.

Source: Own work.

Analysis of the variable "Characteristic of the Questionnaire

The variable "Questionnaire characteristic" of the validated CDES questionnaire is made up of ten questions which are analysed in this section. Of these, to the first two, which ask whether the student has a personal computer and whether he/she has an Internet connection at home, all students answered yes. It is quite possible that, in studies of the last decade, there were students who answered no to these questions, but in this study, and in others that this research team is carrying out with this validated questionnaire, they have always answered "yes" to both questions.

The question on the number of hours students use the computer per week was distributed as follows: 7.7% use it "less than one hour"; 42.3% use it "between one hour and up to 5 hours" per week; from "five hours to 20" 34.6% of students use it and only 15.4% use it "more than 20 hours". As for the use, or not, of the computer for the development of lessons, there are still 11.5% who indicate that they do not use it and 88.5% who do use it. These percentages are compatible with those of the previous question.

For the question on the basic training they have received, 7.7% indicated that they had not received any training. The remaining 46.2% of students said that they had received information on office software. The rest of the percentages are distributed among the other options, although it should be noted that only 6.8% of students ticked the option "Learning specific software for my area of studies".

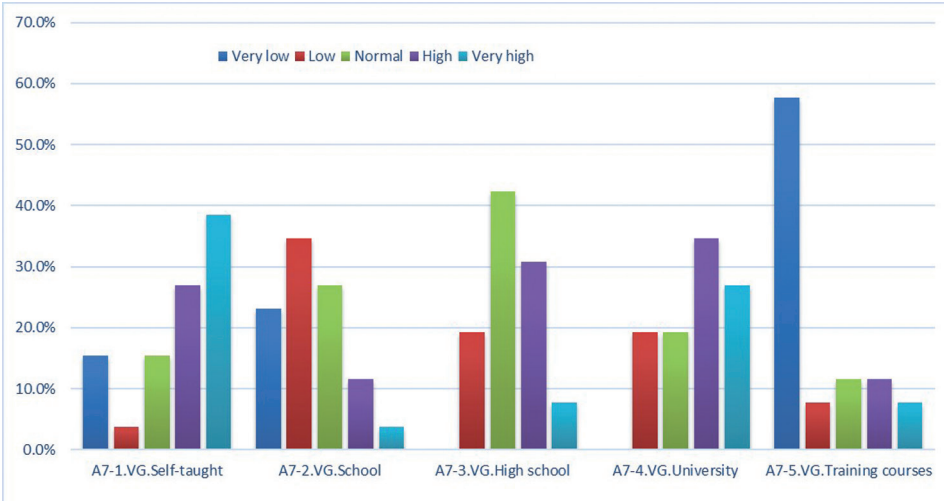

Figure 5. Distribution of ICT training received by pupils.
Source: Own work.

Very interesting is the origin of the training that pupils say they have received in the use of ICT. A summary can be seen in Figure 5, which shows that 65.4% of pupils say that they have received little or very little training through specific courses. It is also important to highlight that the vast majority have received training at school and university.

As for the number of years students have been using the computer, only 7.7% of them say that they have been using it for less than 5 years. 46.2% have been using it for between five and ten years. 30.8% of pupils say that they have been using computers for between ten and fifteen years. Finally, 11.5% also say that they have been using the computer for more than 15 years. In this variable there is a data loss of 3.8% according to SPSS.

The question on how the use of computers and technology contributes to the improvement of quality as a future professional of the students of the degrees in Labour Relations and Human Resources of the University of Extremadura, has been distributed as follows: 61.5% of them indicate that they totally agree; if they are added to the 26.9% who indicate that they agree, they constitute a total of 88.4%. The previous value is a great majority of them, leaving only 7.7% for the values of neutrality and 3.8% in disagreement on the Likert scale, and 0%, i.e. no student has marked the option of "totally disagree".

Finally, to close this section of the analysis of the "characteristic of the questionnaire", the students' assessment of the degree to which their teachers should have mastered the use of ICT in the area of Financial Economics and Accounting can be seen in Figure 6 where it can be seen that it is a normal distribution where the central values of 4, 5 and 6 are those with the highest values.

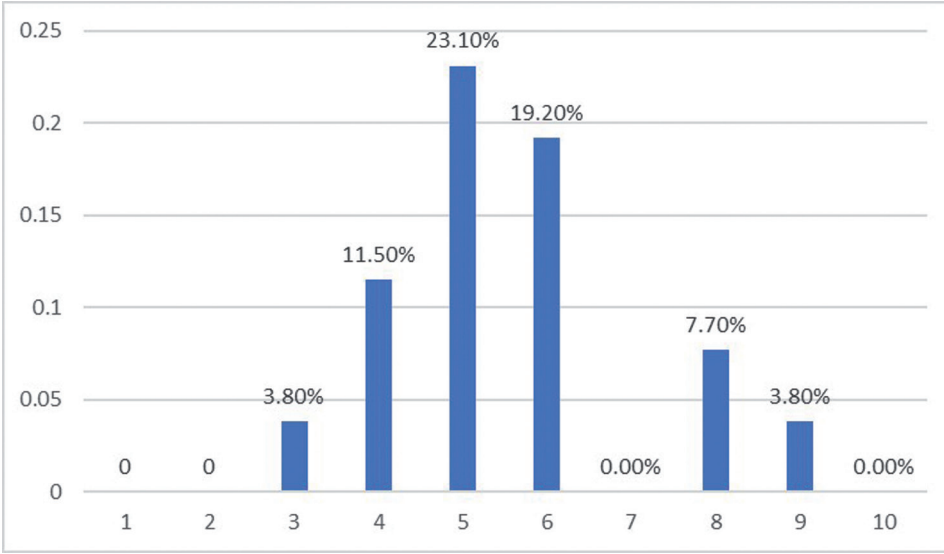

Figure 6. Distribution of responses on the degree of ICT use or management that pupils believe their teachers should have.

S o u r c e: Own work.

Analysis of the Technological Literacy dimension

The Technological Literacy dimension is composed of 11 questions. Each of them has been rated on a Likert scale with the values: 1-not at all important; 2-not very important; 3-more or less important; 4-important and 5-very important. Table 4 shows the mean of each of the questions rated by the students. Of these, with a value of 4.23 the best rated question is "AT1". The lowest rated questions were "AT3" and "AT11" with an average of 3.38.

Table 4
Means of the questions of the Technological Literacy dimens

Código SPSS	Question statement	Mean
AT1. ManejarOrdenador	Manage the resources of a computer through the different Operating Systems (Windows, Linux, Mac).	4.23
AT2.Herra_Ofimaticas	Use office automation tools for information processing (text editors, digital presentation editors, spreadsheets, databases, etc.).	4.15
AT3.Herra_Audio_ video	Master image, audio and digital video processing tools (Gimp, PhotoShop, Audacity, Cdex, Moviemaker, etc.).	3.38

AT4.Crear_ BasesDatos	Create databases through specific software (Acces, Filemaker) that allow the organisation and management of information.	3.46
AT5.Usar_ RecursosInformacion	Use existing and emerging digital tools effectively for locating, analysing, and evaluating information resources.	3.80
AT6. CorreoElectronico	Use communication tools based on email client and webmail services (Eudora, Thunderbird, Gmail, Outlook, etc.).	3.96
AT7.ConverSincrona	Develop online conversations through synchronous web-based communication tools (chat, instant messaging services, Skype, videoconferencing tools, etc.).	4.00
AT8.ConverAsincrona	Develop online conversations through asynchronous web-based communication tools, both traditional and emerging (forums, mailing lists, discussion groups, tweets, etc.).	3.46
AT9. TrabajosColaborativos	Carry out collaborative work through online tools such as Groupware (Kolab, GoogleDocs, etc.).	3.54
AT10. DominarHeramientas	Master web tools for sharing and publishing online resources (GoogleVideo, Youtube, Flickr, Slideshare, Scribd, etc.).	3.50
AT11. UsarPlataformas	Effective use of e-learning/b-learning platforms for online training and collaboration (Dokeos, Moodle, BSCW, WebCt, Ilias, etc.).	3.38

S o u r c e: Own work.

Applying the Digital Competence calculation for the Technological Literacy dimension, the results mean that 7.7% have a basic level, 34.6% have an intermediate level and 57.7% have an advanced level.

Analysis of the Access to and Use of Information Dimension

The Access to and Use of Information dimension is composed of 8 questions. Each of them has been rated on a Likert scale with the values: 1-not at all important; 2-not very important; 3-more or less important; 4-important and 5-very important. Table 5 shows the mean of each of the questions rated by the students. Of these, in this dimension, the highest mean is the question coded as "AUI5" with 3.96. And none of them, therefore, reaches 4.

Table 5
Means of the questions in the Access to and Use of Information dimension

Código SPSS	Question statement	Mean
AUI1.Defi_ Problemas	Define problems to be solved with the use of ICTs.	3.38
AUI2.Dise_Proyecto	Design a research project on the basis of a problem to be solved, identifying the most appropriate ICT resources.	3.77
AUI3.Bus_Info	Plan information searches for problem solving.	3.88
AUI4.Efectuar	Perform information retrieval, organisation and management using technological tools and services.	3.88
AUI5.Identificar	Identify relevant information by evaluating different sources and their provenance.	3.96
AUI6.Sintetizar	Synthesise selected information by organising it appropriately for the construction and assimilation of new knowledge.	3.88
AUI7.Demostrar	Demonstrate the usefulness of the knowledge gained for decision making in solving a problem.	3.77
AUI8.Devolver	Give back to the community in terms of digital information resources to solve a problem.	3.50

Source: Own work.

Applying the Digital Competence calculation for the dimension of Access to and Use of Information, the results show that 3.8% have a basic level, 30.8% have an intermediate level and 65.4% have an advanced level.

Analysis of the Communication and Collaboration Dimension

The Communication and Collaboration dimension is composed of 8 questions. Each of them has been rated on a Likert scale with the values: 1-not at all important; 2-not very important; 3-more or less important; 4-important and 5-very important. Table 6 shows the mean of each of the questions rated by the students. In this dimension the highest rated question is "CC3" with 4.0. The question with the lowest score is "CC8" on sharing experiences on social networks.

Table 6
Mean scores for the Communication and Collaboration dimension questions

Código SPSS	Question statement	Mean
CC1. Compartir	Share digital environments and media for collaboration and publication of electronic resources with peers.	3.77

CC2. Inrteractuar	Interact with experts or others using social networks and ICT-based communication channels.	3.85
CC3. Comunicar	Communicate information and ideas effectively to multiple audiences, using a variety of media, formats and platforms.	4.00
CC4. Desarrollar	Develop cultural understanding and global awareness by engaging with professionals from other cultures.	3.65
CC5. Comunicarse	Communicate with experts from other areas through ICT-based communication channels.	3.73
CC6.Formar	Form inter- and multidisciplinary working teams for project development or problem solving.	3.77
CC7.Crear	Create and dynamise professional knowledge networks and communities for collaborative work in virtual environments.	3.73
CC8. Compartir	Share experiences in social networks.	3.31

Source: Own work.

Applying the Digital Competence calculation for the Communication and Collaboration dimension, the results show that 34.6% have an intermediate level and 65.4% have an advanced level.

Analysis of the Digital Citizenship dimension

The Digital Citizenship dimension is also composed of 8 questions. Each of them has been rated on a Likert scale with the values: 1-not at all important; 2-not very important; 3-more or less important; 4-important and 5-very important. Table 7 shows the mean of each of the questions rated by the students. Six of the eight questions have an average response of more than 4 out of 5. The lowest rated question is "CD5" on "Understanding digital etiquette..." with a 3.58. The highest rated question is "CD2" with 4.35 on average.

Applying the Digital Competence calculation for the Digital Citizenship dimension, the results show that 3.8% have a basic level, 23.1% have an intermediate level and 73.1% have an advanced level.

Table 7
Mean scores for the questions in the Digital Citizenship dimension

Código SPSS	Question statement	Mean
CD1.Asumir	Make an ethical commitment to the use of digital information and ICT, including respect for copyright, intellectual property and proper documentation of sources.	4.12
CD2.Promover	Promote safe, legal and responsible use of information and ICTs.	4.35

CD3.Mostrar	Show a positive attitude towards the use of ICTs supporting collaboration, learning and productivity.	4.28
CD4. Demostrar	Demonstrate personal responsibility for lifelong learning using ICTs.	4.15
CD5.Ejercer	Exercise leadership for digital citizenship.	3.58
CD6.Utilizar	Equitable use of appropriate digital tools and resources.	4.00
CD7. Comprender	Understand digital etiquette (netiquette) by developing responsible social interactions related to information and ICT use.	3.65
CD8. Desarrollar	Develop an understanding of cultures and global awareness by engaging with professionals from other cultures, using the communication and collaboration tools of the digital age.	4.00

Source: Own work.

Analysis of the Creativity and Innovation Dimension

The Creativity and Innovation dimension is also composed of 8 questions. Each of them has been rated on a Likert scale with the values: 1-not at all important; 2-not very important; 3-more or less important; 4-important and 5-very important. Table 8 shows the mean of each of the questions rated by the students. The best rated question is "CI2" with 4.27 and the worst rated is "CI9" with 3.73 on average.

Table 8
Mean values of the questions of the Creativity and Innovation Dimension

Código SPSS	Question statement	Mean
CI1.Demostrar	Demonstrate the integration of ICT skills into professional practice.	4.08
CI2.Adaptarse	Adapt to new situations and technological environments.	4.27
CI3. Desarrollar	Develop initiatives with an entrepreneurial spirit in the use of ICTs.	4.00
CI4.Utilizar	Use existing knowledge to generate new ideas, products or processes through ICTs.	3.92
CI5.Crear	Create original work as a means of personal or group expression using ICT, as part of their lifelong and reflective learning.	3.88
CI6.Usar	Use models and simulations to explore complex systems and issues using ICTs.	4.04
CI7.Identificar	Identify trends by anticipating the potential for ICT use.	3.77

CI8. Usarproceso	Use multiple processes and diverse perspectives to explore alternative solutions to the given problem.	3.84
CI9. Reconocer	Recognise the conditions and contexts that call for the use of ICTs (where, when, how).	3.73
CI10.Participar	Participate in professional knowledge communities using ICTs.	3.76
CI11. Desarrollar	Develop experiences that stimulate creative and innovative thinking.	3.92
CI12.Integrar	Integrate digital tools and resources to promote learning skills and creativity.	3.76
CI13.Tender	Aim for professional effectiveness and self-renewal by incorporating ICT in their work context.	4.12

Source: Own work.

Applying the Digital Competence calculation for the Creativity and Innovation dimension, the results are that 3.8% have a basic level, 23.1% have an intermediate level and 73.1% have an advanced level.

Summary of dimensions

Figure 7 shows a summary of the level of digital competence for each dimension. It highlights the dimensions of Digital Citizenship and Creativity and Innovation with 72.4% at the "advanced" level. It should also be noted that the dimensions of Communication and Collaboration and Digital Citizenship have none at the basic level.

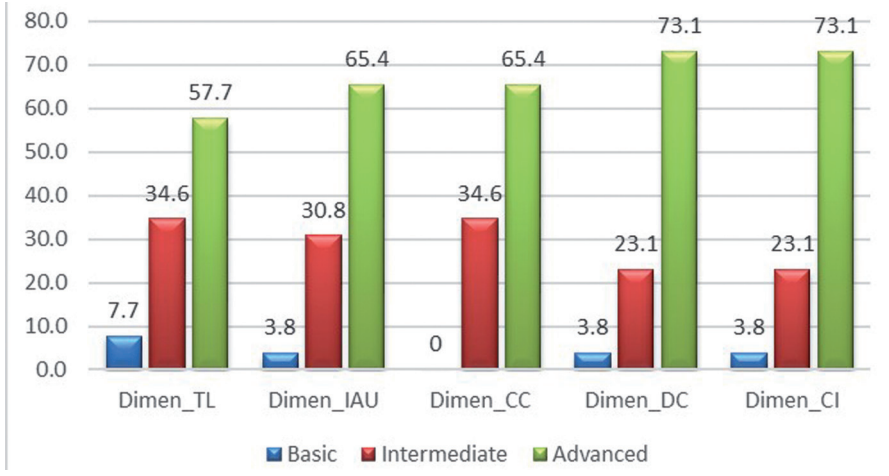

Figure 7. Summary of the level of dimensions.

Sources: Own work.

Analysis of General Digital Competence

Finally, Figure *8* shows the graph generated by the SPSS program from the data of the CDES questionnaire once each of the Dimensions has been calculated. Based on them, the final level of Digital Competence that the students of the Bachelor's Degree in Labour Relations and Human Resources say they have is calculated. It can be seen that more than 65.4% say they have an advanced level, but there are 30.8% who have an intermediate level, which is not low for university students, but it can be improved, and it would be very advisable for them to move on to an advanced level when they enter the world of work and are already university graduates.

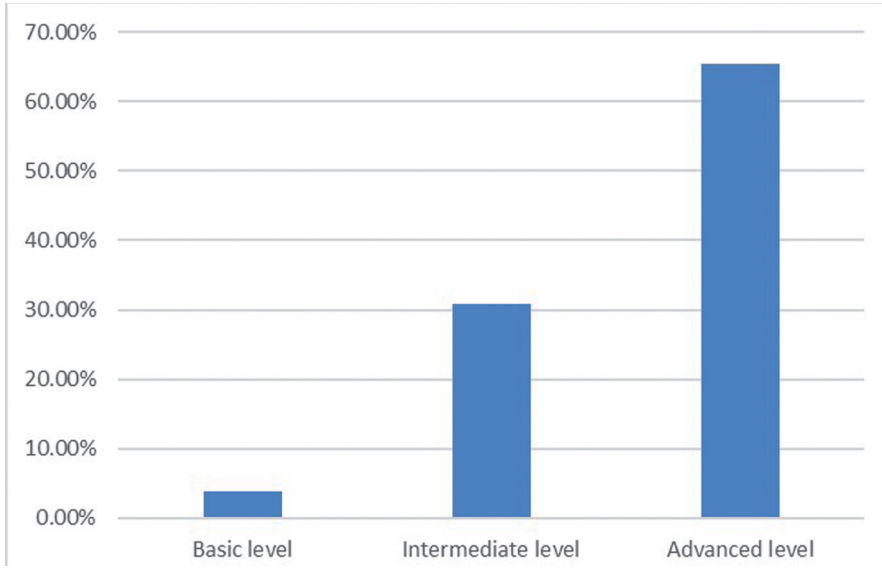

Figure 8. Level of Digital Competence of pupils.

Source: Own work.

Gender independence

For the second objective of this research, which is to determine whether there is a relationship between learner gender and level of digital competence, the following research question is formulated: Is there a relationship between learner gender and level of digital competence? For this question, the null hypothesis (H0: both variables are independent) and the alternative hypothesis (HA: the variables have some degree of association or relationship) are formulated, namely:

H0: There is no relationship between gender and the learner's level of digital competence.

HA: There is a relationship between gender and the learner's level of digital competence.

To demonstrate the null hypothesis or its rejection, a cross table between gender and digital competence is generated. In Figure 9 it can be seen that, when considering each gender as an independent group, the highest number of men who have an advanced level of digital competence is 81.8% and the rest, 18.2%, have an intermediate level. In the group of women, 53.3% have an advanced level, 40.0% have an intermediate level and 6.7% have a basic level.

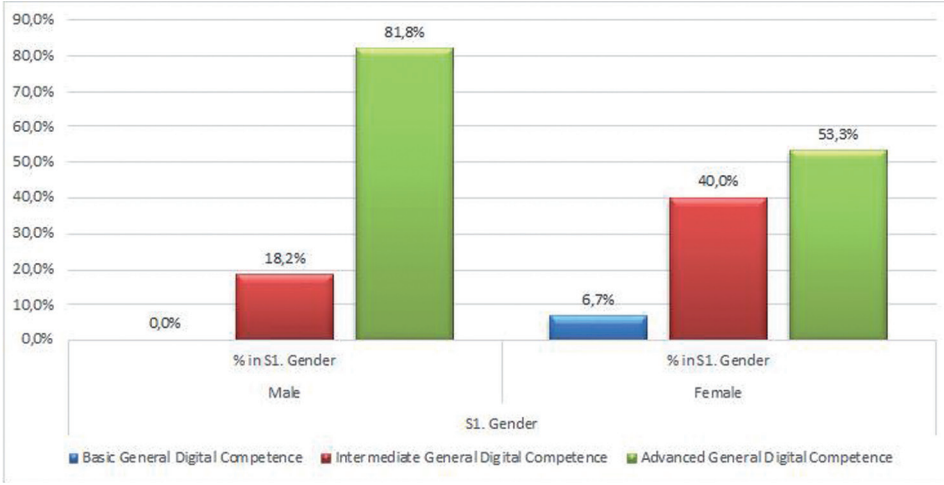

Figure 9. Results of the cross-tabulation of Gender versus Digital Competences.

Source: Own work.

From this cross-tabulation, the "Chi-Square test" statistic is applied, which according to Rodríguez (2004) is an alternative to Pearson's Chi-square statistic (X2 = Chi-square) for testing hypotheses of independence of variables. Pearson's test is based on the differences between observed and expected frequencies. The result of applying this test is shown in Table *9*. It indicates that it has 2 degrees of freedom and the significance value is 0.286 which is greater than 0.05. Consequently, the null hypothesis has to be accepted, and therefore it can be concluded that there is no dependence between gender and the level of digital competence.

Table 9
Chi-square tests of the cross-tabulation in Figure 9

Chi-square Tests			
	Value	Df	Asymptotic
Pearson Chi-Square	2.503[a]	2	.286
Likelihood Ratio	2.920	2	.232

Linear-by-Linear	2.404	1	.121
N of Valid Cases	26		

4 cells (66.7%) have expected count less than 5. The minimum expected counts is.42

Source: Own work.

Conclusions

From the results found, it can be concluded that the instrument used in this research (validated CDES questionnaire) correctly measures what is intended to measure. We found an attempted consistency of the questions, based on the data obtained of "excellent" according to George & Mallery (2019). The same has occurred with the internal consistency of the 5 dimensions with a value of "excellent", too.

The average of each dimension of digital competences on a scale from 1 to 5 is all above 4, with the Digital Citizenship dimension standing out with an average of 4.35. Approximately half of the students have received information on office automation programmes. However, in programmes specific to their area of knowledge, the majority of students indicate that they have not received such training. Almost half of the students (46.2%) say that they have been using computers for between five and ten years. With regard to the use of technology and computers for their future professional development, 88.4% of them say that they consider them necessary (the "agree" and "strongly agree" categories are added together).

With regard to the level of digital competence, based on the analysis of the five dimensions of the questionnaire, it can be concluded that 65.4% of the students of the degrees in Labour Relations and Human Resources have an advanced level in Digital Competences. 30.8% have an intermediate level and only 3.8% have a basic level. Although this is a good level for the vast majority of students, it is understood that it is very necessary for the 34.6% of students who do not have an advanced level to have it once they reach university graduate status, which will make them all more professional, but at the same time freer people.

Finally, for the second objective, the null and alternative hypotheses were formulated regarding the interpretation of whether the level of digital competence is conditioned by the gender of the learner. In this case it was found that there is no relationship between the gender of the learner and the level of digital competences they have. Therefore, the variables are independent and there is no association.

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Triana Arias Abelaira, Belén Mozo Redondo

Postrzeganie przez studentów stosunków pracy i zasobów ludzkich ich szkolenia w zakresie kompetencji cyfrowych

Streszczenie

W dzisiejszych czasach zdobycie wysokiego poziomu kompetencji cyfrowych stało się realną potrzebą rozwoju zawodowego w każdej dziedzinie. Przyszli absolwenci kierunku stosunki pracy i zasoby ludzkie powinni osiągnąć zaawansowany poziom tej umiejętności. Głównym celem badań jest określenie poziomu nabycia kompetencji cyfrowych u studentów stosunków pracy i zasobów ludzkich. Drugim celem jest stwierdzenie, czy istnieje związek między płcią a osiąganiem kompetencji cyfrowych. Niniejsza praca opiera się na zastosowaniu kwestionariusza dotyczącego kompetencji cyfrowych, który jest określony na 5 aspektach i głównie zorganizowany wokół podstawy pytań na skali typu Likerta. Zebrane dane należą do 26 studentów studiujących na trzecim roku kierunku stosunki pracy i zasoby ludzkie na Uniwersytecie Extremadura. Uzyskane wyniki wskazują, że zdecydowana większość studentów (65.4%) posiada zaawansowany poziom kompetencji cyfrowych, niemniej jednak dla pozostałych wskazane byłoby osiągnięcie tego samego poziomu przed ukończeniem studiów i rozpoczęciem pracy. Drugim ważnym wnioskiem jest to, że poziom nabycia kompetencji cyfrowych nie jest uwarunkowany aspektami płci.

Keywords: Kompetencje cyfrowe, szkolnictwo wyższe, stosunki pracy i zasoby ludzkie, ocena kompetencji, perspektywa płci

Triana Arias Abelaira, Belén Mozo Redondo

Percepción de los alumnos de Relaciones Laborales y Recursos Humanos sobre su formación en competencias digitales

Resumen

En la sociedad actual cualquier profesional necesita tener un alto nivel de competencias digitales para su desarrollo profesional. Los futuros graduados en Relaciones Laborales y Recursos Humanos deben tener un nivel avanzado de dichas competencias. El objetivo principal de esta investigación es determinar el nivel de competencias digitales de los alumnos del grado de Relaciones Laborales y Recursos Humanos. Un segundo objetivo es determinar si existe una relación entre el género del alumno y el nivel de competencia digital. La investigación se ha basado en la aplicación de un cuestionario validado sobre competencias digitales organizado en base a 5 dimensiones, estructurado fundamentalmente en base a preguntas de una escala tipo Likert. Los datos se recogieron de 26 alumnos del tercer curso del Grado de Relaciones Laborales y Recursos Humanos de la Universidad de Extremadura. Los resultados obtenidos muestran que una gran mayoría de alumnos (65.4%) tienen un nivel avanzado en competencias digitales, no obstante, sería aconsejable que el resto de los alumnos tengan este nivel cuando se gradúen en su titulación y pasen a ejercer profesionalmente. Una segunda conclusión y muy importante es que el nivel de competencias digitales no está condicionado por el género del alumno.

Palabras clave: Competencias digitales, educación superior, Relaciones Laborales y Recursos Humanos, evaluación de competencias, perspectiva de genero

Триана Ариас Абелайра, Белен Мозо Редондо

Восприятие студентами факультета трудовых отношений и человеческих ресурсов своей подготовки в области цифровых компетентностей

Резюме

В современном обществе любой специалист должен обладать высоким уровнем цифровых навыков для своего профессионального развития. Будущие выпускники в области трудовых отношений и человеческих ресурсов должны владеть этими навыками на продвинутом уровне. Основная цель данного исследования - определить уровень цифровой компетентности студентов, обучающихся по специальности "Трудовые отношения и человеческие ресурсы". Вторая цель - определить, существует ли связь между полом студента и уровнем цифровой компетентности. Исследование было основано на применении валидированного вопросника по цифровым компетенциям, организованного на основе 5 измерений, структурированного в основном на основе вопросов со шкалой Лайкерта. Данные были собраны у 26 студентов третьего года обучения по специальности "Трудовые отношения и человеческие ресурсы" в Университете Эстремадуры. Полученные результаты показывают, что значительное большинство студентов (65.4%) имеют продвинутый уровень цифровых компетенций, однако было бы желательно, чтобы остальные студенты имели этот уровень, когда они закончат обучение

и перейдут к профессиональной деятельности. Второй и очень важный вывод заключается в том, что уровень цифровых компетенций не зависит от пола студента.

Ключевые слова: Цифровые компетенции, высшее образование, трудовые отношения и человеческие ресурсы, оценка компетентностей, гендерная перспектива.

II. Methods and Technology in Education

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Artem Yurchenko
Makarenko Sumy State Pedagogical University, Ukraine
https://orcid.org/0000-0002-6770-186X

Kateryna Yurchenko
Makarenko Sumy State Pedagogical University, Ukraine
https://orcid.org/0000-0002-4153-4397

Volodymyr Proshkin
Borys Grinchenko Kyiv University, Ukraine
https://orcid.org/0000-0002-9785-0612

Olena Semenikhina
Makarenko Sumy State Pedagogical University, Ukraine
https://orcid.org/0000-0002-3896-8151

World Practices of STEM Education Implementation: Current Problems and Results

Abstract

The term “STEM education” has been clarified. It is well-founded that STEM education is a learning process that is based on interdisciplinary and practical orientation and provides the formation of skills to acquire theoretical knowledge, and master scientific methods for their use in solving specific practical tasks (not only in professional activities). A quantitative analysis of the results of the implementation of STEM education, presented in scientific publications, was carried out. A small percentage of publications dedicated to STEM education have been found. It has been established that in countries with developed economies, there are significantly more published scientific results regarding the implementation of STEM education. Practical cases of the implementation of STEM education in Ukraine and the world are highlighted. Among these are the organization of STEM education through solving problem situations in field conditions; basing classes on solving practical tasks in a certain professional field; examples of organizing

and conducting lessons in high school on an interdisciplinary basis; cases for four scenario exercises; cases for solving practice-oriented tasks at home; and cases of inclusive education using STEM projects. A content analysis of modern practices of implementing STEM education on the basis of open educational resources such as Coursera, edX, Udemy, Prometheus, and EdEra was conducted. The analysis of open educational resources shows that there are too few courses that would focus on STEM education and on training teachers to implement STEM-oriented education. The basis for the research was scientific publications in publications indexed by the scientometric databases Scopus and Web of Science over the past 10 years, and dissertation research conducted in Ukraine.

K e y w o r d s: STEM education, forms of implementation of STEM education, practices of implementing STEM education, STEM education in Ukraine, teacher training for STEM-oriented education

Modern achievements of society, as a rule, are determined by the integration of various spheres of human activity. Such integration can be observed especially in relation to information technologies, which today tend to develop rapidly. Society consumes more and more technological products and services developed by scientific and technical specialists. There is more and more research in data processing, virtual and augmented reality, robotics, the Internet of Things, renewable energy, ecology, and more. According to these studies, the direction of STEM (**S**cience, **T**echnology, **E**ngineering, **M**athematics), which integrates natural sciences, technology, engineering, and mathematics was updated. Considering the importance of the combination of these industries for the technological development of each country, the question arises about the appropriate STEM education, which would provide the basic training of the younger generation to solve real-life problems on the basis of such integration.

At the same time, the perception of STEM education by teachers and scientists and the ways of its implementation in the conditions of certain educational institutions in different countries of the world are not established today. The authors of the article faced the problem of interpreting STEM education when the need for advanced training of teachers (mathematics, natural sciences, computer science) for its implementation in general secondary education institutions was actualized: in order to teach the future teacher to implement STEM-oriented learning, it is first necessary to understand its essence and characteristics. This means that today there is no single vision for providing the young generation with STEM education. Therefore, we see the following areas of scientific research: 1) clarification of the concept of “STEM education”; 2) quantitative analysis of the results of the implementation of STEM education presented in scientific

publications; 3) highlighting practical cases of STEM education implementation; 4) analysis of modern practices of implementing STEM education on the basis of open educational resources.

Methodology of Research

The basis for the research was scientific publications in publications indexed by the scientometric databases Scopus and Web of Science over the past 10 years, and dissertation research conducted in Ukraine. We also used the content of educational online platforms for analysis.

To solve the first, second, and partially third tasks of the research, theoretical methods of scientific knowledge were used – analysis of the results of scientific research, their systematization, and generalization. To solve the third and fourth tasks of the research, a content analysis of online educational platforms such as Coursera, edX, Udemy, Prometheus, and EdEra was conducted and the content of individual online courses was studied. The choice of these educational platforms is due to the following reasons: according to ClassCentral (Shah, 2021), among the world leaders of popularity, the first places are occupied by platforms like Coursera, and edX; the Udemy platform today has the largest number of educational resources (about 200 thousand); the Prometheus and EdEra platforms are Ukrainian, and therefore they are the most acceptable for the average teacher in Ukraine.

Results of Research

A. Clarification of the concept of "STEM education"

We researched the publications in which the issue of STEM education was raised, with the aim of revealing the interpretation of the term "STEM education" by different scientists in the world. We found out that STEM education can mean:

- a study program that combines two or more fields (science, technology, engineering, and mathematics; for example, mathematics and engineering or physics and information technology, etc.) and is based on an integrated approach to their teaching, that is, the content of individual fields are not separated, but presented as one course (Yata et al., 2020);
- interdisciplinary learning that combines the study of science, technology, engineering, and mathematics based on problem-based scenarios (Qin & Fu, 2017);

- several academic disciplines, the mastery of which involves the use of information technologies and ensures the formation of skills to perform practical tasks that will be important for employment (Martyniuk, 2018; Balyk & Shmyger, 2017; Department of STEM education IMZO);
- the process of assimilation of knowledge, abilities, skills, and methods of activity, which involves interdisciplinary approaches in the construction of the content of education and the selection of methods and tools of education (Botuzova, 2018);
- technology for the development of personal qualities of young people, which ensures the ability to solve complex problems, think critically, and have cognitive flexibility and creativity (online: https://osvita.ua/legislation/Ser_osv/61444/);
- creative space for the formation of a child's worldview (Hom, 2022);
- pedagogical technology for the formation and development of mental, cognitive, and creative qualities of young people to ensure their competitiveness in the modern labor market based on the integration of the content and methodologies of natural sciences, technologies, engineering, and mathematics (Stryzhak et al., 2017);
- a method of teaching a subject for personalization of learning (Oliynyk et al., 2020);
- an educational strategy that follows project-based learning through a process of scientific research and engineering design for a team-based solution to a real problem situation (Zhao, 2015; Zhou & Li, 2021);
- an approach to learning that is based on the visualization of scientific phenomena, which "allows you to easily grasp and acquire knowledge based on practice and a deep understanding of processes" (online: https://uk.wikipedia.org/wiki/STEM);

The analysis and systematization of the above-mentioned and other interpretations of the concept of "STEM education" made it possible to distinguish more general approaches to its interpretation (Fig. 1).

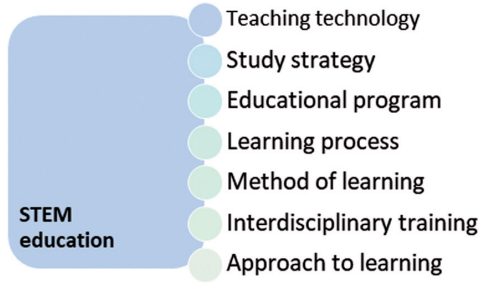

Figure 1. Approaches to the interpretation of the concept of "STEM education"

Source: Own work

The analysis of these approaches in the interpretation of STEM education revealed their dual basis (Fig. 2):

1. interdisciplinarity (or intersubject connections of natural sciences, technologies, engineering, and mathematics), which ensures the development of personal qualities of young people – critical thinking, creativity, transfer of knowledge and methods from one sphere of science or activity to another;
2. practical orientation (or the solution of life's (not far-fetched) tasks), which enables the formation of skills to use theoretical knowledge and methods in practice.

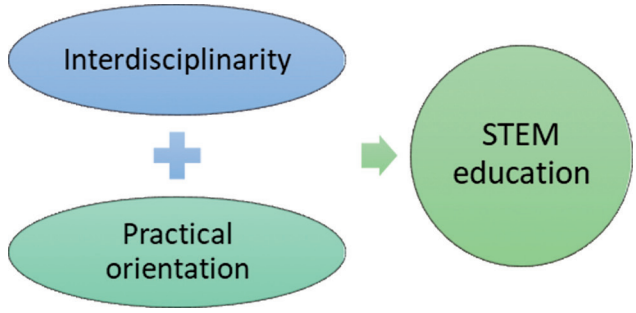

Figure 2. Important components of STEM education

Source: Own work

At the same time, certain approaches to the definition of STEM education have appeared to be debatable. Specifically, can STEM education be considered a technology or a curriculum? STEM education does not involve an established algorithm of actions, so it is not a technology or a curriculum. However, we are impressed by the idea that STEM education is a learning process that is based on interdisciplinary and practical orientation and provides the formation of skills to acquire theoretical knowledge, and master scientific methods for their use in solving specific practical tasks (not only in professional activities).

B. Quantitative analysis of the results of the implementation of STEM education, presented in scientific publications

We also assessed the importance of STEM education in the context of scientific and pedagogical research. In particular, we analyzed the data of the scientometric databases of Scopus and Web of Science, where a large number of scientific publications are concentrated. The analysis was carried out through filters and keyword searches. The obtained data are systematized by us in Figure 3 ("a" – matching by the keyword "STEM"; "b" – matching by the keywords "Education" (left) and "STEM Education" (right); "c" – matching by the keywords "Education in school" (left) and "STEM Education in school" (right); "d" – matching by the

keywords “Education in colleges” (left) and “STEM Education in colleges” (right); “e” – matching by the keywords “STEM Education” (left), “STEM Education in school” (middle) and “STEM Education in colleges” (right); “f” is a left-to-right keyword mapping of “STEM Education in England”, “STEM Education in Germany”, “STEM Education in USA”, “STEM Education in India”, “STEM Education in Ukraine», “STEM Education in Finland”, “STEM Education in China”).

The analysis of the presented data confirms that:

1. the percentage of articles (2.1%) devoted to STEM education is insignificant in relation to the number of articles on education (58 042 vs. 2 750 865). This means that the ideas of STEM education are beginning to be actualized in the scientific environment, however, research on STEM education has not gained unconditional distribution and relevance;
2. the percentage of articles (2.8%) devoted to STEM education in secondary schools is insignificant in relation to the number of articles on school education (7 300 vs. 263 130). The percentage of articles (3.4%) devoted to STEM education in colleges, is relative to the number of articles on college and university education (2 734 vs. 29 304). At the same time, the comparison of absolute indicators still indicates a greater interest in the implementation of STEM education at the school level;
3. in countries with a developed economy, the number of scientific results on the introduction of STEM education is greater in relation to other countries all over the world. In particular, by country: USA – more than 12 000 publications, Germany – more than 3 000 publications, England – more than 2 000 publications.

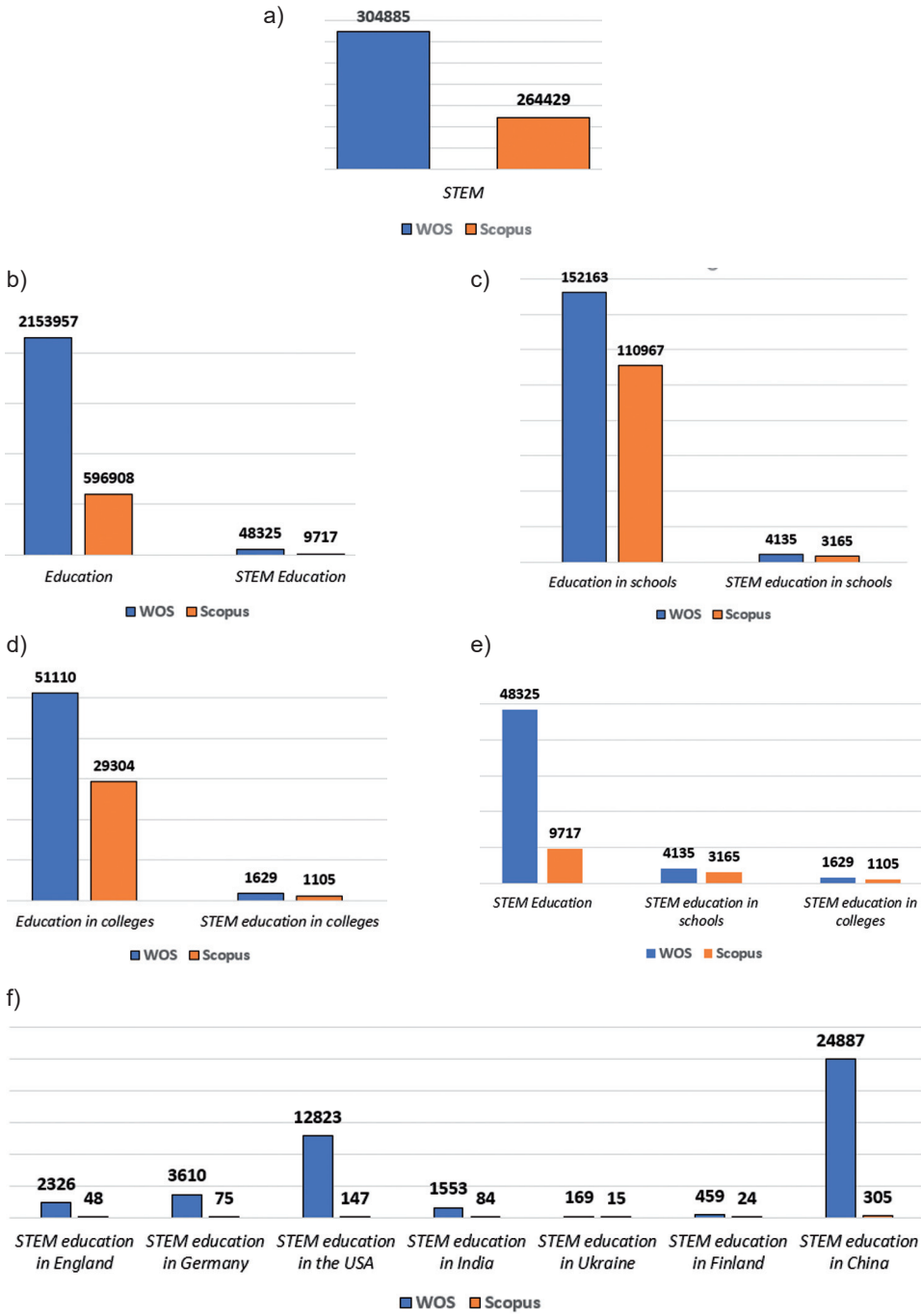

Figure 3. Number of publications by keyword

S o u r c e: Own work

C. Highlighting practical cases of STEM education implementation

In addition to the quantitative analysis of publications in the scientometric databases of Scopus and Web of Science, we investigated ways of implementing STEM education, which is described in scientific publications. In particular, we discovered:

- cases presenting the experience of organizing STEM education through the solution of problem situations in the field, and the leading teaching method in the game (Pig Game, Pit and Pendulum, Sociologists' Dilemma, etc.) with parallel coaching/curator support (online: https://activatelearning.com/meaningful-math/);
- cases, which describe the conduct of classes on solving practical tasks in a certain professional field, meeting with representatives of STEM professions, and excursions to STEM enterprises (online: https://www.facebook.com/groups/80589541236);
- examples of organizing and conducting lessons in a high school on an interdisciplinary basis, where the leading method of learning is solving practice-oriented tasks (Hsiao et al., 2022);
- cases for four scenario exercises in the form of a special course that integrates natural sciences, technology, engineering, and mathematics and is designed to identify "STEM talents" (Wang et al., 2022);
- cases for solving practically oriented tasks at home (Yan, 2017);
- cases of inclusive education using STEM projects (Skowronek et al., 2022).

The study of the Ukrainian experience of STEM education demonstrates the use of practice-oriented tasks and projects. It should be noted that STEM education in Ukraine is not characterized by systematicity and stability. It is implemented by enthusiastic teachers based on original projects and programs, often reduced to group project activities or solving applied problems. In most cases, STEM education is still perceived as an integration of science, technology, and mathematics subjects.

If we consider STEM education in Ukraine through the prism of training young people in informatics, mathematics, and physics, we should note certain trends in the shift of emphasis toward the study of technologies (while training young people not only as software users but also as developers of mobile applications), the establishment of mathematics and physics training. The information technology course provides solution of competence problems and the implementation of individual educational projects on an integration basis (mathematics, physics, chemistry, biology, geography, etc.). The analysis of the content of the physics course in the context of STEM education proves that since 2015, the developers of the curriculum for the 7th grade have provided only the implementation of educational projects (outstanding physicists; physics in everyday life, technology, production; observation of physical phenomena of the environment; diffusion in everyday life). The analysis of the tasks of the school mathematics course shows

that they are oriented to a greater extent on the formation of computational and transformational skills. The formation of modeling skills or the applied use of mathematical knowledge is not systematic. According to the results of the analysis of the educational workload, we note that on average, the school has 3.5 lessons of mathematics, 1.5-2.5 lessons of physics, and 1.5 lessons of computer science per week.

D. Analysis of modern practices of implementing STEM education on open educational resources

The analysis of modern practices of implementing STEM education on open educational resources was carried out by us, taking into account their popularity. Today, there are a large number of educational platforms on the Internet. According to Class Central (Shah, 2021), more than 220 million students are registered in more than 19,000 courses. Among the world leaders in 2021, the Coursera and EdX platforms were noted (Shah, 2021).

We simultaneously studied Coursera, edX, Udemy, and Ukrainian platforms – Prometheus and EdEra. *Coursera* (coursera.org) – is an online learning platform that was founded in 2012 and today has more than 92 million listeners and offers more than 4 000 courses from 150 universities around the world (Riley de León, 2021). *edX* (edx.org) – is a platform with university-level online courses founded in 2012. The resource has more than 3 600 courses and 42 million registered users (online: https://impact.edx.org/hubfs/impact-report-2022.pdf). Udemy (udemy.com) – is an online platform that positions itself as a commercial provider of massive open online courses, founded in 2010. At the beginning of 2022, the platform had more than 52 million listeners, 196 thousand courses, and 68 thousand instructors who teach courses in more than 75 languages. During the history of the platform, more than 712 million courses have been registered on it (online: https://about.udemy.com/). *Prometheus* (prometheus.org.ua) – is the largest Ukrainian online educational platform, which has 2 million listeners and offers more than 250 online courses. Courses for both schoolchildren and adults are placed on the platform. *EdEra* (ed-era.com) – is a Ukrainian online education studio founded in 2014 that distributes free courses and develops projects for training employees of certain companies (Marchenko, 2019).

We investigated the quantitative content of online platforms. In particular, based on data from the Class Central company (Shah, 2021), it was found that the share of online courses in natural sciences, technology, engineering, and mathematics (all areas of STEM education) is a total of 39.9%: natural sciences account for 9.5% of all courses, technologies – 20.2%, engineering – 7.3%, mathematics – 2.9% (Fig. 4).

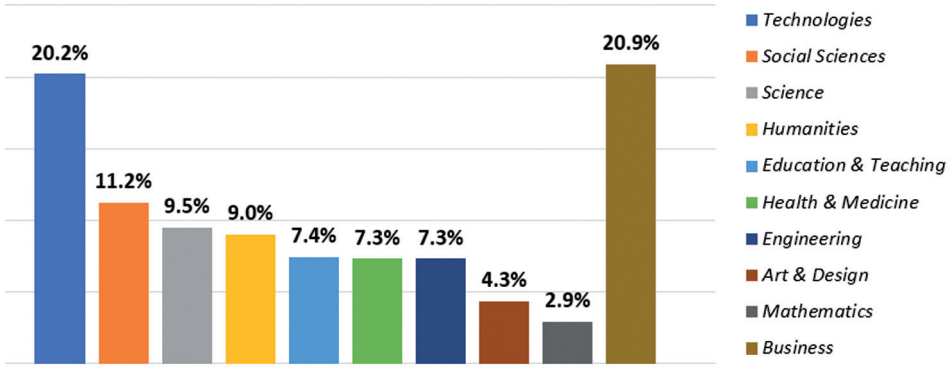

Figure 4. Distribution of courses in different subjects according to Class Central data

S o u r c e: Own work

It should be noted that the quantitative weight of mathematics courses in the context of the four directions of STEM education is insignificant in relation to all other directions of STEM (Fig. 5)

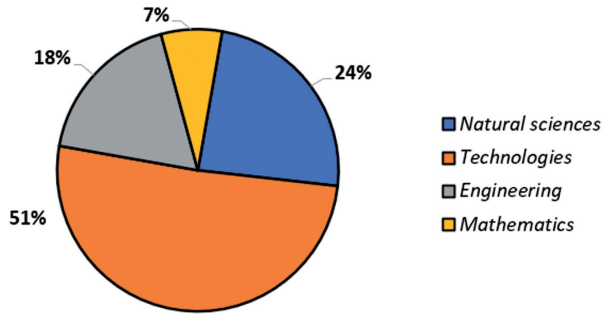

Figure 5. Distribution of courses by areas of STEM education

S o u r c e: Own work

At the same time, data on individual fields cannot provide STEM training and talk about the demand for STEM education. Therefore, we investigated the above-mentioned platforms for the availability of STEM education courses, that is, those that integrate the four directions in a certain way (Table 1).

Table 1
Quantitative indicators of STEM courses on Virtual Educational Resources

Virtual Educational Resources	Number of courses in which the concept of STEM is mentioned		Number of courses with the word STEM in their title	
		among them Ukrainian		among them Ukrainian
Coursera	1942	22	4	0
edX	888	0	7	0
Udemy	482	0	8	0
Prometheus	1	0	1	0
EdEra	0	0	0	0

S o u r c e: Own work

Based on the results of the analysis, we have that there is only one course related to STEM on Ukrainian educational platforms. The Prometheus platform offers a single course called "English for STEM (Science, Technology, Engineering, and Mathematics)" (online: https://courses.prometheus.org.ua/courses/course-v1:AH+ENG_STEM101+2020_T1/about), which is a copy of the course "English for Science, Technology, Engineering, and Mathematics" hosted on the Coursera platform (online: https://www.coursera.org/learn/stem).

Coursera has the largest number of courses that mention something about STEM. In particular, there are 1,942 courses on the platform that mention the word "STEM" either in the title, in the abstract, or in the course itself. Only 4 courses have the word STEM in the title.

To get an idea of the capacity (content) of STEM-related courses, we took individual courses on the platforms *Coursera, edX, and Udemy* into account.

On the *Coursera* platform, the course "Emprendiendo en STEM (Entrepreneurship in STEM)" was completed, which was developed by the teachers of the Australian University – Business School (online: https://www.coursera.org/learn/emprendiendo-en-stem). The course consists of six learning modules: "Entrepreneurs and the Entrepreneurial Process", "Opportunities, Value Generation and the Business Model", "Innovation Processes in STEM", "Startup Financing", "Marketing and Sales", "Teams, Leadership, and Social Capital". The content of the course includes many educational and methodological materials: video lectures, multimedia presentations, audio, mandatory and optional questions for self-examination, questionnaires, tests, training manuals, and forums for each week of training. We see the lack of specific examples of the implementation of STEM in entrepreneurship as a disadvantage of the course.

On the *edX* platform, there is a course "Advancing Learning Through Evidence-Based STEM Teaching (Improving learning through evidence-based STEM teaching)" (online: https://www.edx.org/course/advancing-learning-through-evidence-based-stem-teaching-5). Its developers are faculty from Vanderbilt University, Michigan State University, Northwestern University, and the University of Nebraska. The goal of the course is to master evidence-based educational practices. Pedagogical practices of active learning using modern STEM technologies in classes are analyzed during training (8 weeks): peer learning, problem-based learning, research laboratories, cooperative learning, flipped classrooms, and learning through diversity. The experience of the course teachers with the implementation of STEM lessons in the educational process is interesting.

The *Udemy* platform contains the course "Finding the Art in Engineering – STEM to STEAM" (online: https://www.udemy.com/course/art-in-engineering/). The course was developed by mechanical engineering and 3D design expert J. Devitry of the Utah State University Space Engineering Center. This course aims to demonstrate ways to expand your own creative thinking through the creation of original patterns, various forms, and artistic images using 3D modeling. The course consists of 30 educational videos that show how to create a project using knowledge from the fields of engineering and art.

Summary characteristics of STEM-related courses are presented in Table 2.

Table 2
Characteristics of STEM-related courses

Platform	Coursera	edX	Udemy
Course title	Emprendiendo en STEM	Advancing Learning Through Evidence-Based STEM Teaching	Finding the Art in Engineering - STEM to STEAM
Volume	6 weeks	8 weeks	2 hours
Language of teaching	Spanish	English	English
Tests	+	+	–
Practical tasks	+	–	–
Video lectures	+	+	+
Materials for self-study	+	+	–
Forum	+	+	–
Feedback from the teacher	–	–	–
Peer assessment	+	+	–
Providing a certificate	+	–	–

S o u r c e: Own work

According to the results of the analysis of courses on open educational platforms related to STEM education, it should be stated that the developers do not offer courses specifically for acquiring STEM education.

Discussion

The experience of implementing STEM education in Ukraine is not extensive, but it can be systematized and generalized. In particular, it should be stated that the development of STEM education in Ukrainian institutions of general secondary and extra-curricular education is identified with the development of natural and mathematical education, and natural sciences include sciences that study the phenomena of the surrounding world in living and non-living nature: physics, astronomy, chemistry, biology, ecology, geography, and medicine. This means that the term "STEM education" to a greater extent refers to the strategy in the education of Ukrainian youth.

STEM education in Ukraine is based on the Concept of the Development of Science and Mathematics Education (STEM Education) until 2027 (online: https://zakon.rada.gov.ua/laws/show/960-2020-%D1%80#Text). The concept defines a set of measures related to the formation and development of scientific research and engineering skills, invention, entrepreneurship, early professional self-determination, and popularization of scientific, technical, and engineering professions.

The plan included many activities, such as holding conferences, seminars, and symposiums on the use of the latest methods of STEM education for teaching and scientific-pedagogical staff, creation of databases or interactive maps of educational institutions implementing STEM education and their constant updating; conducting contests, tournaments, Olympiads, intellectual competitions, summer schools, and all-Ukrainian science festivals for education seekers, and teaching staff, conducting career orientation events for education seekers in the format of "Professions of the Future" projects, weeks on the popularization of STEM education, etc., improving the qualifications of teaching and scientific-pedagogical staff on the use of the latest methods of STEM education, creation of new STEM centers and STEM laboratories, expansion of their areas of activity, and equipping of science and mathematics offices in educational institutions, updating the design of school areas, promoting the functioning of institutions of specialized scientific education, introduction and support of sections of the scientific and technical direction of out-of-school education institutions, development and implementation of modern methods of distance learning of science and mathematics subjects, ensuring the replenishment of the libraries of educational institutions with high-

-quality popular science and scientific literature, conducting research and preparing recommendations using the methods of science and mathematics education (STEM education) in educational institutions, etc.

At the same time, taking into account our own experience and communication with fellow teachers, we note the fragmentation and non-systematic nature of the Ukrainian experience of implementing STEM education. In institutions of general secondary education, teachers use programs and textbooks that are not focused on STEM education, in particular, do not provide solutions to a sufficient number of interdisciplinary tasks and the use of information technologies for this. STEM projects are offered by enthusiastic teachers and in most cases in non-formal education settings.

The USA's experience in developing STEM education is interesting. S. Vakil and R. Ayers (2019) describe that in the USA, a special role is assigned to a two-year higher education in the STEM field, which is obtained in municipal colleges. This is due to experts' forecasts, according to which in the near future the need for graduates with bachelor's degrees who are knowledgeable in the STEM field will double the need for specialists who have not received an education in this field.

The effectiveness of a two-year higher STEM education requires high-quality scientific and teaching staff and the corresponding methodical base, which is the basis for high-quality training of students in a short time (an offer of training programs and methods, provision of personnel, etc.); the need of the private sector (organizations and firms) for specialists in the field of new, promising technologies (availability of demand for graduates); training students oriented to further study in intensive university programs; motivation of college graduates to continue their education combined with practical application of already acquired knowledge and skills in the field of STEM.

The experience of STEM education in the USA is systematized in the work by Park, Wu & Erduran (2020). The authors note that in the USA considerable attention is paid to the relationship between schools and universities. In particular, when evaluating applications for funding research projects from universities, the presence of proposals for the use of research results aimed at strengthening ties with the K-12 system ("outreach effect" criterion) must be taken into account in the projects.

As a part of the USA National Nanotechnology Initiative, six leading research universities have been selected to establish National Science Centers for Nanoengineering. These educational institutions, through connections with schools, help teachers to modernize educational programs through the development and implementation of new STEM disciplines. Learners are given the opportunity to study physics, chemistry, and the basics of nanoengineering and at the same time get acquainted with university laboratory research.

Within the framework of the project, several categories of participants. These include researchers who sometimes find it difficult to develop training materials

that learners can understand; university faculties responsible for the development/ organization of effective methods of teaching schoolchildren; schools that provide balanced training in all the necessary disciplines combined with additional subjects in nanotechnology.

Considering the experience of Great Britain, the authors S. Baselga, O. Garrido, and H. Buron drew attention to the period devoted to STEM education, namely from kindergarten to the end of school. STEM education is designed as a set of STEM disciplines that are mastered taking into account interdisciplinary approaches (Baselga et al., 2020). In the course of its implementation, considerable attention is paid to the relationship between schools and research universities. The forms of interaction of leading universities with schools are different. At the same time, the attention is paid to training not only schoolchildren but also their teachers.

In Great Britain, the need to change public opinion regarding technical and engineering professions has been recognized. In particular, a national campaign is being developed and launched to popularize engineering education, and its importance for society, and improvement of learners' attitudes toward engineering careers. At the same time, in Great Britain, at the national level, the problem that arose during the introduction of STEM education was realized. Some schools orient learners to a narrow list of subjects that are easier to study but do not provide the formation of a fundamental basis for further development in the engineering and technical fields of science.

Conclusions

1. According to the analysis of scientific and pedagogical research and the results of the comparison and generalization of approaches to the definition of STEM education, we consider, STEM education should be understood as a type of education that is based on the mastery of various branches of science (natural sciences, technology, engineering, mathematics) taking into account their interdisciplinary connections with the aim of forming a person's knowledge system and methods sufficient to solve current professional tasks. STEM education cannot be considered a learning technology, a certain academic discipline, or a separate branch of science.
2. Quantitative analysis of research results, which are presented in the world's leading publications, indexed by the scientometric databases of Scopus and Web of Science, shows the relevance of the problem of implementing STEM education, and it should be noted that in countries with a developed economy, there are significantly more scientific results regarding the implementation of STEM education. However, such materials have not acquired systematization

and generalization. To a greater extent, they describe either the implementation of a certain interdisciplinary project or their own experience of STEM-oriented training through solving case problems or existing positive practices of counseling in STEM-oriented training of young people. Among the scientific publications, there are not enough materials related to the preparation of teachers for STEM-oriented training.

3. The analysis of open educational resources shows that there are not enough courses that would focus on STEM education and on the preparation of teachers to implement STEM-oriented training. The courses offered promote the idea of integrating knowledge from different fields to solve professional tasks that cannot claim to solve the problem of providing STEM education. We explain this by the lack of established practices of successful STEM education, as well as the lack of a clear understanding of STEM education as a type of modern education.

The obtained results actualize other directions of scientific research, namely the study of the importance of various fields in STEM education at the "school, college, university" levels, the characteristics of the content of each of the STEM directions (natural sciences, technologies, engineering, mathematics), the determination of the most effective forms and methods STEM-oriented education.

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Artem Yurchenko, Kateryna Yurchenko, Volodymyr Proshkin, Olena Semenikhina

Światowe praktyki wdrażania edukacji STEM: aktualne problemy i wyniki

S t r e s z c z e n i e

Powszechnie uważa się, że edukacja STEM jest procesem uczenia się, który opiera się na interdyscyplinarnej i praktycznej orientacji i zapewnia kształtowanie umiejętności zdobywania wiedzy teoretycznej i opanowania metod naukowych do ich wykorzystania w rozwiązywaniu określonych zadań praktycznych (nie tylko w działalności zawodowej). Przeprowadzono analizę ilościową wyników wdrażania edukacji STEM, przedstawionych w publikacjach naukowych. Znaleziono niewielki odsetek publikacji poświęconych edukacji STEM. Ustalono, że w krajach o rozwiniętych gospodarkach publikowanych jest znacznie więcej wyników naukowych dotyczących wdrażania edukacji STEM. Podkreślono praktyczne przypadki wdrażania edukacji STEM w Ukrainie i na świecie. Wśród nich jest organizacja edukacji STEM poprzez rozwiązywanie sytuacji problemowych w warunkach terenowych; prowadzenie zajęć z rozwiązywania praktycznych zadań w określonej dziedzinie zawodowej; przykłady organizowania i prowadzenia lekcji w liceum na zasadzie interdyscyplinarnej; przypadki dla czterech ćwiczeń scenariuszowych; przypadki rozwiązywania zadań zorientowanych na praktykę w domu; przypadki edukacji włączającej z wykorzystaniem projektów STEM. Przeprowadzono analizę treści współczesnych praktyk wdrażania edukacji STEM na otwartych zasobach edukacyjnych Coursera, edX, Udemy, Prometheus i EdEra. Analiza otwartych zasobów edukacyjnych pokazuje, że istnieje zbyt mało kursów, które koncentrowałyby się na edukacji STEM i szkoleniu nauczycieli w zakresie wdrażania edukacji zorientowanej na STEM. Podstawą badań były publikacje naukowe w publikacjach indeksowanych przez scjentometryczne bazy danych Scopus i Web of Science w ciągu ostatnich 10 lat oraz badania dysertacyjne prowadzone w Ukrainie.

S ł o w a k l u c z o w e: edukacja STEM, formy wdrażania edukacji STEM, praktyki wdrażania edukacji STEM, edukacja STEM w Ukrainie, szkolenie nauczycieli edukacji zorientowanej na STEM.

Artem Yurchenko, Kateryna Yurchenko, Volodymyr Proshkin, Olena Semenikhina

Prácticas mundiales de implementación de la educación STEM: problemas actuales y resultados

Resumen

Se ha aclarado el término “educación STEM”. Está bien fundado que la educación STEM es un proceso de aprendizaje que se basa en la orientación interdisciplinaria y práctica y proporciona la formación de habilidades para adquirir conocimientos teóricos y dominar métodos científicos para su uso en la resolución de tareas prácticas específicas (no solo en actividades profesionales). Se realizó un análisis cuantitativo de los resultados de la implementación de la educación STEM, presentados en publicaciones científicas. Se encontró un pequeño porcentaje de publicaciones dedicadas a la educación STEM . Se ha establecido que en los países con economías desarrolladas hay significativamente más resultados científicos publicados con respecto a la implementación de la educación STEM. Se destacan casos prácticos de la implementación de la educación STEM en Ucrania y el mundo. Entre ellos se encuentran la organización de la educación STEM a través de la resolución de situaciones problemáticas en condiciones de campo; impartir clases sobre la resolución de tareas prácticas en un determinado campo profesional; ejemplos de organización y realización de lecciones en la escuela secundaria sobre una base interdisciplinaria; casos para cuatro ejercicios de escenarios; casos para resolver tareas orientadas a la práctica en el hogar; casos de educación inclusiva utilizando proyectos STEM. Se realizó un análisis de contenido de las prácticas modernas de implementación de la educación STEM en los recursos educativos abiertos Coursera, edX, Udemy, Prometheus y EdEra. El análisis de los recursos educativos abiertos muestra que hay muy pocos cursos que se centren en la educación STEM y en la capacitación de maestros para implementar la educación orientada a STEM. La base de la investigación fueron las publicaciones científicas en publicaciones indexadas por las bases de datos cienciométricas Scopus y Web of Science en los últimos l0 años, y la investigación de tesis realizada en Ucrania.

Palabras clav: Educación STEM, formas de implementación de la educación STEM, prácticas de implementación de la educación STEM, educación STEM en Ucrania, capacitación docente para la educación orientada a STEM.

Артем Юрченко, Екатерина Юрченко, Владимир Прошкин, Елена Семенихина

Мировые практики внедрения STEM-образования: актуальные проблемы и результаты

Аннотация

Уточнен термин “STEM-образование”. Обосновано, что STEM-образование – это процесс обучения, который базируется на междисциплинарной и практической направленности и обеспечивает формирование навыков приобретения теоретических знаний, овладения научными методами их использования при решении конкретных практических задач (не только в профессиональной деятельности). Проведен количественный анализ результатов внедрения STEM-образования, представленных в научных публикациях. Определен небольшой процент публикаций, посвященных STEM-образованию. Установлено, что в странах с развитой эконо-

микой есть значительно больше опубликованных научных результатов относительно внедрения STEM-образования. Освещены практические примеры внедрения STEM-образования в Украине и мире. Среди них: организация STEM-образования через решение проблемных ситуаций в полевых условиях; проведение занятий по решению практических задач в определенной профессиональной сфере; примеры организации и проведения уроков в вузе на междисциплинарной основе; кейсы для четырех сценарных учений; кейсы для решения практико-ориентированных задач на дому; кейсы инклюзивного образования с использованием STEM-проектов. Проведен контент-анализ современных практик внедрения STEM-образования на открытых образовательных ресурсах Coursera, edX, Udemy, Prometheus, EdEra. Анализ открытых образовательных ресурсов показывает, что существует слишком мало курсов, которые были бы ориентированы на STEM-образование и на подготовку учителей для внедрения STEM-ориентированного образования. Основой для исследования послужили научные публикации в изданиях, индексируемых наукометрическими базами данных Scopus и Web of Science за последние 10 лет, и диссертационные исследования, проведенные в Украине.

К л ю ч е в ы е с л о в а: STEM-образование, формы внедрения STEM-образования, практики внедрения STEM-образования, STEM-образования в Украине, подготовка учителей для STEM-ориентированного образования

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Marzena Wysocka-Narewska
University of Silesia, Katowice
https://orcid.org/0000-0003-2787-8676

Distance Learning at the Level of Primary Education: Parents' Opinions and Reflections

Abstract

Distance learning is a type of instruction between a teacher and students separated by a physical distance where communication takes place through mediated information encompassing one or more technological media. In other words, the instruction participants stay in different places, yet take part in the same learning activities sequenced, paced and controlled by the teacher using new technologies. The paper aims to show the advantages and disadvantages of distance education during the COVID-19 lockdown at the primary level, the emphasis being placed upon, among others, the teacher–student and student–student relationships, the infrastructure and skills required for a lesson, as well as some "food for thought" in the form of possible changes and areas of improvement to be introduced suggested by the sample. The data comes from the questionnaire distributed among 60 parents of first graders. This age group is believed to be extremely demanding and difficult to teach, mainly due to the literacy and numeracy skills included in the core curriculum, falling on the onset of the first grade in a primary school.

K e y w o r d s: distance learning, primary school level, parental opinions and reflections, COVID-19

The COVID-19 pandemic has imposed numerous changes and restrictions on the society, especially the education systems around the world. As a result, the educational communities have made enormous efforts to maintain learning continuity during the very period, often transferring a lot of responsibilities to the part of the teachers. It was very often the case that teachers had to adapt to new modes of delivery of teaching, for which they may not have been trained (Zaworska-Nikoniuk, 2021). Also, students have had to rely more on their own resources to continue learning remotely, not to mention younger learners being supported more intensively by their parents, at least in theory.

The studies conducted so far have shown negative opinions on school relationships, namely between teachers, between teachers and students, as well as between parents and their children (Pyżalski, 2020, Łukianow et al., 2021, p. 48). What has been reported more frequently includes the necessity of parents' engagement and/or even interference in their kids' lessons and school life (PwC, 2020), teacher's complaints about ineffectiveness of remote teaching, and an alarming decrease in student distance learning involvement (Łukianow et al., 2021b, Cuprjak & Szmalec, 2021) as well as lack of digital competences observed among parents (Romaniuk & Łukasiewiecz-Wieleba, 2020). All these gaps and deficiencies have contributed to a more thorough investigation of distance learning amongst its younger participants and their parents, the results of which are presented in this article.

Distance Learning

Following Roblyer & Edwards (2000, p. 192), distance learning is "the acquisition of knowledge and skills through mediated information and instruction, encompassing all technologies and other forms of learning at a distance." The instruction is delivered by means of a teacher who is physically located in a different place from the learner, and performs his/her role at disparate times. To be more specific, the instructor controls the instructional sequencing and pacing and all learners take part in the same learning activities. Distance learning was originally created for busy working adults or students living in remote areas. However, over the years, students of all ages and backgrounds have begun using distance learning to support or complete their education. Nowadays, at the time of the COVID-19 pandemic, it is treated as an integral part of education in many institutions around the world.

Types of Distance Learning

Synchronous and asynchronous types are the most basic and frequent in use (Taplin et al., 2013, p. 63). A synchronous type of learning is based upon cooperative participation of students in learning activities and requires from them to be present at a given time. The tools used in this process range from online chats and videoconferences to application sharing, whiteboard, polling and virtual classrooms, to name a few, to serve the real-time ask-answer sessions. An asynchronous mode of learning, on the other hand, is time independent (Young, 2011). It means that the students work according to their own learning schedule, which due to its flexibility, allows for a more student-centred approach. The teacher/student interaction is executed in different forms, such as virtual office hours, e-mails or "check-in" online conversations once a week or month. A whole range of tools is used in asynchronous learning: reading materials in PDF files, pre-recorded lectures, presentations, Google Drive for coordinated group projects, educational games, audio tapes and videos (Taplin et al., 2013, p. 64). The huge advantage of the asynchronous method is that students can always come back to those materials in case of uncertainty or any problematic issues.

General Advantages and Disadvantages of Distance Learning

There is a number of benefits of distance learning. First of all, it is its convenience, as many of the technologies are easily accessible from home. Numerous forms of distance learning allow students to participate in the school activities on an individual basis whenever they wish, because of its previously-mentioned approachability. As Isik et al. (2010, p. 218) emphasize, this kind of education is also quite affordable, very often involving low-priced equipment and materials or no cost at all. Also, some teaching aids are granted for free which, additionally, being multi-sensory are likely to meet everyone's learning preferences. On this basis, distance learning can offer increased interactions with students, particularly when it comes to introverted students who are too shy to ask questions in class. The idea of giving such a group of students an opportunity to contribute to the classes via e-mail or other personalized means is expected to lower their inhibitions. This "opening up" can also be extended to balancing inequalities between age groups, geographical expansion of education access, delivering education for large audiences, offering the combination of education with work or family life, etc.

There is no denying that distance learning, due to numerous benefits mentioned above, is perceived in a positive way by many, yet, as Christensen et al. claim, "it may come with hidden costs" (2001, p. 265). First of all, compared with a traditional course and method of delivery, distance learning imposes a disproportionate amount of effort on the part of instructors. Namely, distance teaching is not only limited to the lesson/session period, but also plenty of time is devoted to student support and preparation, not to mention discipline and Internet connection problems to deal with. Using technology, that is, online tools and infrastructure seems to be another important obstacle. It is proved that among both parties (i.e., students and teachers) there is a high percentage of those lacking enough skill and experience in managing or following online courses, including the extreme cases of digital exclusion most frequently identified with systemic differences in the access to and use of new technologies. Last but not least, the greatest disadvantage of distance education is social isolation observed as a result of missing the socio-physical interaction that comes with attending a traditional environment. The longer the period of off-site classes, the stronger the feeling of the lack of belonging to any social group, and no point in organizing such meetings. However, recent studies (cf. Jelińska & Paradowski, 2021, p. 319) have reported that this sense of isolation is expected to decrease slightly with the use of communication technologies in the form of video conferencing, provided it is a short-term phenomenon caused by an emergency instruction exclusively.

Distance Learning in Primary Education

So far, the research conducted on primary school distance education has revealed more disadvantages than advantages. Following Scarpellini et al. (2021), teachers' negative experiences included technical problems (e.g., with internet connectivity, slow performance on platforms), limited infrastructure (e.g., lack of tablets laptops, mobile phones) justified by the fact that families gave priority of equipment to older siblings, lack of "immediate" participation and reaction that is made possible during face-to-face classes. Also, the instructors complained about the fact that some parents could not support/help their children, and that some children were simply "lost." Teachers' positive experiences, on the other hand, involved familiarization of children with the technology and digital tools, existence of parents' help (e.g., in individual and group work, as well as creation and delivery of activities via ICT).

When it comes to parents and their views on distance learning, they are far from being satisfied. Based on Scarpellini et al. (2021), distance learning was

not well evaluated by parents because of the lack of organization and planned routine, no assessment of the children's work and the difficulty in contacting the teachers. Home confinement, due to the COVID-19 pandemic was perceived as a lesser evil for children, who were forced to drastically change their habits as a result of the lack of or minimized socialization opportunities. The lack of structured, daily school life and the absence of interactions with peers, together with an instable quarantine routine, influenced the emotional and behavioural condition of children. The observed behaviour changes among children during the lockdown period(s) ranged from increased instances of restlessness and aggressiveness, boredom, sadness, attention deficit, and hyperactivity to regression. Also, difficulties in motivating children to study in general were mentioned.

As distance education at the primary level is almost inseparable from the situation in which parents support their children, especially the youngest, in the educational process and, at the same time, work and provide home care, with negative consequences on their own distress level, the majority of parents lack time to help their child with school assignments. Some of them even complain about being forced to play the role of a teacher because of their effort and commitment required. Some other views report on the fact that grandparents and/or family friends are not ready to assist kids due to the lockdown/quarantine or other reasons, and refer to distance learning as "inconvenience" (Godawa, 2020, p. 207). This pessimistic picture of the implementation of distance teaching during the COVID-19 pandemic is complemented by the average level of satisfaction that contains appreciation resulting from teachers' work, and understanding of difficult conditions of life as well as hopes for teacher's better organization and school functioning in the future.

Early School Education in Poland

The Study

As the above-mentioned problems arise anew with every single school closure, I decided to have a closer look at the earliest sector of primary education, paying special attention to the first grade that is being ascribed a load of materials and skills to be covered. To be more specific, the primary school's task is to gently introduce the child to the world of knowledge, prepare him or her to perform the duties of a pupil and implement self-development (Surma, 2021, p. 82). The school provides safe conditions and a friendly atmosphere for learning, taking into account the individual abilities and educational needs of the student. The most important aim of education in primary school is to ensure the integral biological,

cognitive, emotional, social and moral development of the pupil. The curriculum should be implemented with respect for the dignity of pupils, their individuality and originality. The education should be adequate to the level of children's development, and specifically to their perceptual, imaginative and reasoning abilities.

Educational goals are general requirements of early childhood education. In the curriculum, they are described in relation to four areas of child development: physical, emotional, social and cognitive. The set of general objectives specified in the curriculum represents the foundation on which the initial work at educational level II in classes IV–VIII will be based, and it covers such areas as behaviour, skills, abilities and initial knowledge.

In terms of content of teaching, the curriculum outlines specific requirements in the form of a list of general objectives of pupils' development, to be achieved at the end of early childhood education. Pupils should achieve them by completing tasks that require multidirectional activity. The scope of this activity is determined by educational results listed in the core curriculum, which are assigned to individual scientific disciplines. The disciplines are as follows: Polish language education, mathematical education, social education, environmental education, visual arts education, technical education, computer science education, music education, modern foreign language education, and regional language education. However, in the curriculum it is emphasized that the presentation of the educational results in relation to the scientific disciplines is a kind of convention, which is necessary for the clarity of the description, and not an organizational directive. The educational process at this stage is integrated, not subject-related.

The curriculum also provides detailed specifications concerning the conditions and methods of implementation of the educational content. In this section, specific requirements regulating the circumstances of the learning environment, teachers' roles and tasks, as well as classroom conditions are set out. In the curriculum, it is emphasized that the early childhood education is characterised by calmness and regularity of the learning process, multi-directionality, and adaptation of the pace of work to the psychomotor and perceptual abilities of each pupil. Education at this stage requires great care in the selection of content, means, strategies, methods of education, in order to show pupils an integrated image of the world and facilitate its understanding. Education in classes I–III is implemented in the form of integrated education, which includes functional, methodical, organisational and content integration. The integrating element of the educational directions is language in its semiotic aspect.

Teachers in grades I–III, recognising the possibilities of learners, including those with special educational needs, use their own creative solutions in the implementation of the content of the core curriculum of general education for primary school. They have to take into account the three natural learning strategies of children: perceptual-reproductive (the pupil learns according to a presented model – imitates), perceptual-explanatory (the pupil learns partly according to

a model, seeks explanations and prompts) and perceptual-innovative (the pupil transforms information and creates innovations, including his/her own thinking strategies). It is also crucial that teachers at this stage use a variety of educational methods, including organisational methods. The class teacher knows the functions of the methods used and adapts them to the learning style of his/her pupils. A detailed description of teachers' tasks and roles is presented in the curriculum for each subject separately.

The classroom in early childhood education should be a space enabling free movement, work in diverse groups, at tables, and also on a suitably prepared floor (e.g. carpet). Classroom furniture should not restrict pupils' ability to adopt a variety of body positions during learning and play. Chairs, tables and furniture, as well as blackboards, carpets and rugs enable both full group work and small group work with the possibility of individualisation and adaptation also for pupils with special educational needs. The layout of the space allows the pupils to focus their attention, to develop a variety of activities, and to relax. The classroom should be equipped with all the necessary technical devices, tools, and aids that support the learning process. Among these, the curriculum lists a blackboard, balls, skipping ropes, bags, poles, rattles, etc. Moreover, the equipment in the room should enable the presentation of pupils' work, for example easels, screens, installations, cork boards, etc. The arrangement of the room, starting with the arrangement of the furniture, as well as the elements of the decoration, allows for work with the method chosen by the teacher.

The Study Area and Objective

In general, the aim of the study was to examine parents' views on distance education delivered at primary schools during the COVID-19 lockdown in Poland, an emphasis being put on what is widely referred to as the classroom management, including conduct and content management. More specifically, it focused on all the classroom routines and procedures implemented through distance learning, involving observed behavior and relationship patterns, as well as the materials offered and practised with students. Additionally, the intention of the research was to check if the private school does better at distance learning than a public one, as widely-expected.

The Study Participants

The study participants consisted of 60 parents of first-grade primary school students (see Table 1). The three groups they were divided into reflected the three schools under investigation, namely Szkoła Podstawowa nr 2 (Primary School no. 2) in Będzin (school A), Szkoła Podstawowa nr 9 (Primary School no. 9) in Katowice (school B), and Salezjański Ośrodek Szkolno-Wychowawczy (Silesian School and Education Center) in Tarnowskie Góry (school C). The first

two schools were public institutions while the third one was run by a private owner. The lessons covered by the study included the early education conducted by one teacher referred to as the form teacher, offering the elements of (http://www.podstawaprogramowa.pl):

- Polish language,
- Mathematical education,
- Social education,
- Environmental education,
- Visual arts education,
- Technical education,
- Computer science education,
- Music education,
- Physical education.

Table 1

The Participants of the Study

	Age range		Sex		Education		Participation	
School	25–35	36–45	F	M	Secondary	Higher	Full	Partial
A	1	19	19	1	3	17	15	5
B	3	17	18	2	2	18	12	8
C	5	15	18	2	–	20	15	5

S o u r c e: author's own work

As seen from Table 1, the vast majority of the participants were females, aged between 36 and 45. What is more, most of them completed higher education, including biology, sociology, economy, as well as Polish philology and IT studies, and admitted full support given to their children throughout distance education.

The Study Tool

The parents involved in the study were given a questionnaire in January 2021, which fell on the end of the winter semester, being, at the same time, the first distance learning period which the participants experienced. Graphically speaking, the questionnaire consisted of four parts. The first three took the form of closed-ended entries. The first was designed to check if certain classroom management components appeared in a lesson. These, in turn, ranged from the quality of lesson planning and organization and the teacher's ability to maintain discipline among children to specific patterns of teacher interactions, both teacher- and student-initiated ones.

The second one was to measure parents' satisfaction with teacher's organizational skills, and infrastructure observed betweenwhiles. Here, it was mainly time management and common computer skills that were taken into account.

The third section was devoted to the course contents, and the frequency of skills being introduced into the classroom and mastered among the students.

The fourth part was open in nature and conclusive to some extent. It was closely related to parents' opinions and asked for the advantages and disadvantages of distance learning taking place in their children's virtual classrooms.

Presentation of the Results

Table 2
The Results. Part 1. The Appearance of Class Organization Skills and Behavior During Distance Learning

Criteria	Yes			No			I don'tknow	
The quality of lessons	A	B	C	A	B	C	A	B
Punctuality	3	18	20	17	2	0	0	0
Netiquette rules	2	14	20	13	1	0	5	5
Well-organized classes	11	18	20	9	2	0	0	0
A logical layout of the contents	7	15	20	13	5	0	0	0
Variety of tasks	18	16	20	2	4	0	0	0
Clarity of instructions	10	15	20	10	5	0	0	0
Discipline	5	15	20	15	5	0	0	0
Learner's activity in the lesson	10	12	20	10	8	0	0	0
Engaging selected learners in the lesson	2	5	15	18	15	5	0	0
Engaging all learners in the lesson	5	10	20	15	10	0	0	0
Learner's response to teacher's command	10	12	18	10	8	2	0	0
Teacher's response to learner's answer	10	12	18	10	8	2	0	0
Teacher's answer to learner's question	6	12	18	14	8	2	0	0

S o u r c e: author's own work

School A

Table 2 clearly shows that the representatives of this school have noticed the biggest problems as regards the teacher's general and specific organizational skills as well as teacher-student-student interactions. The greatest complaints cover very poor punctuality referred to as beginning and finishing classes on time, and the lack of netiquette understood as a set of rules for acceptable online behavior. Accordingly, a vast majority of the sample complain about students' constant misbehavior, and chaos resulting from an illogical layout of the lesson contents. The group points out ambiguity of task instructions, too much task variety as well as infrequent teacher's reaction to learner's questions. The teacher seems passive and does not really involve learners into the lesson.

School B

The group of parents representing School B, pictured in numbers in Table 2, have created a more positive picture concerning class organization and interaction. According to the majority of the respondents, the teacher respects punctuality and netiquette rules. Each class conducted is considered to be well and logically organized with varied tasks provided with clear instructions. What they have observed less frequently, though, included learners' engagement in the lesson, and teacher-student interactions bringing about either a handful of children taking an active part in the class, or a teacher remaining silent and unresponsive to kids' requests and questions.

School C

The sample evaluating School C made the most positive observations regarding both the teacher's managerial skills and the behavior—related atmosphere in the lesson. Following the figures presented in the table, it can be assumed that all lessons are marked by punctuality. What is more, each day and each lesson is conducted with the use of netiquette rules. When it comes to the lesson management itself, all the parents admit to have observed well-organized lessons, with the materials presented logically to the learners. As regards the materials themselves, these are believed to be diversified, and simple in their form thanks to clear instructions. As a result, the whole group of respondents ascertains that the teacher keeps discipline in the classroom and all the students actively participate. This impression is slightly modified by parents when asked about the children's even participation in an activity. What we learn is that the teacher tends to engage only selected students in a task (see Table 2).

Table 3
The Results Part 2.Satisfaction with the Following Managerial Skills Observed During Distance Learning

Criteria	Yes			No		
The quality of lessons	A	B	C	A	B	C
Time management	2	10	18	18	10	2
Pace of work	5	10	15	15	10	5
Number of exercises done per lesson	3	10	18	17	10	2
Teacher's ability to use the Teams application	10	10	15	10	10	5
Child's ability to use the Teams application	10	10	10	10	10	10
The quality of Internet connection	10	10	15	10	10	5

S o u r c e: author's own work

Comparing the data from Table 3 with the previous cases, the group of the School A parents evaluating the level of their satisfaction with the class managerial and ICT skills appeared most pessimistic. When it comes to the former, the majority of parents make complaints about the teacher wrongly dividing time between different activities, and working with children at the same tempo all day. Subsequently, it gave rise to an unsatisfying number of activities introduced during a lesson. The latter, namely, the computer skills, are much more positively viewed by the sample. Half of them is satisfied with teacher's computer competence, and children dealing with the Teams application in particular. Also, the same number of respondents voiced their satisfaction with the Internet quality

As far as the School B is concerned, all the answers received from the parents are equally positive and negative. It means that half of the group represents advocates of the teacher's way of managing time and pace of work, which immediately translates into the appropriate number of activities introduced each lesson. The same is with the computer-related aspects, including both teacher's and learner's skills assessed positively by 50 per cent of those under investigation.

School C

Again, the results obtained from this group show more confidence about class management than the previous ones. The highest ratings go to the teacher's time and task control. Slightly less satisfying are the computer skills both the teacher and the children have shown during classes.

Table 4
The Results Part 3. The Frequency of Skills Practised During Distance Learning

Skills	Always			Often			Too often			Seldom			Too seldom			Never		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Reading skills	0	5	18	3	15	0	0	0	0	17	0	2	3	0	0	0	0	0
Writing skills	0	0	0	5	18	18	15	0	2	0	2	0	0	0	0	0	0	0
Numeracy skills	0	2	20	5	18	0	15	0	0	0	0	0	0	0	0	0	0	0
Social skills	0	0	0	0	0	5	0	0	0	5	10	15	15	10	0	0	0	0
Art/craft skills	0	0	0	0	10	18	0	0	2	3	5	0	16	5	0	1	0	0
Music skills	0	0	0	4	20	20	16	0	0	0	0	0	0	0	0	0	0	0

S o u r c e: author'sown work

The type of skills practiced during distance learning can be seen in Table 4. Based on the data, it is evident that the representatives of the School A point out two types of extreme situations, namely the teacher paying too much attention to writing, numeracy skills and music on the one hand and spending too little time exercising reading on the other. Also, the majority of the sample complain about under-developing manual and social skills.

In the case of school B, most of the parents claim that the teacher devotes the same amount of time to reading, writing and numeracy skills, and treat them as "often practiced ones." All of the sample agree on practising musical skills frequently, and half of the examined consider social skills as being not developed enough among the class.

The group of parents from the School C are slightly more ahead of the previous groups, having observed reading and numeracy skills practiced whatever the circumstances. The second most frequent in their opinion are writing, craft/art and musical skills. And, as it was formerly stated, social skills are thought of as neglected because rarely developed in the classroom.

Advantages and Disadvantages

Finally, when asked about the advantages of such classes, the parents touched upon several issues that can be grouped into[1]:

- climate (less stressful, convenience, flexibility, individual work),
- organization (saving time, good pace, task variety, good level of instruction, well-organized work, more free time, effectiveness, good level of instruction, no need to get up early in the morning),
- safety and parental control (insight into the lesson, no contact with the virus, no need to go out, kids' safety),
- new experience (individual work, gaining technical skills, gaining new experience).

All the information obtained is juxtaposed in Table 5, which is subject to comparison and further evaluation.

Table 5

The Results. Part 4: Advantages

School A	School B	School C
1. parents insight into the lessons	1. **kids' safety**	1. **no need to go out**
2. parental control	2. saving time	2. **kids' safety**
3. individual work	3. good pace	3. well-organized work
4. saving time	4. task variety	4. effectiveness
5. **kids' safety**	5. **no need to go out**	5. flexibility
6. no contact with the virus	6. good level of instruction	6. **individual work**
7. no need to get up early in the morning	7. gaining technical skills	7. more free time
8. **no need to go out**	8. **individual work**	8. gaining new experience
9. less stressful		9. convenience
10. gaining technical skills		

S o u r c e: author's own work

On the basis of information presented in Table 5, what parents from school A value most is their control over the lesson, its content and management. Further come the conditions allowing the learners to save time, and the circumstances guaranteeing safety on the road as the kids do not have to commute to school.

[1] The statements underlined are shared by the representatives of two schools; the ones in bold reflect the opinions observed among the three schools.

Accordingly, children are granted health safety, at least to some extent, which makes the whole situation less stressful for all the household members. And, finally, the group lists promotion of technical and IT skills fostering the children's digital competences. A slightly different hierarchy of values can be read from school B data and parents prioritizing kids' safety deriving from isolation, and well-managed classes over the development of learners' individual work. Likewise, the group of parents representing school C puts their kids' virus protection first, followed by the qualities contributing to a good lesson organization, and new experiences (new tasks and new skills).[2]

As it was the case with the advantages of distance education, the drawbacks enumerated by the three groups of parents have a lot in common, though follow a different order, and, thus, can be encapsulated under the following headings:

- management (chaotic organization of a lesson, doing everything at once, slow pace of work, discipline problems, table work, too much for learners to do, too few activities done per day, "poor level," teacher selectivity, lowered teaching standards),
- social aspects (a limited contact with a teacher, no contact with classmates, isolation),
- technology (technical problems, ineffective),
- health issues (no physical education classes, lack of physical activity, too much time in front of the screen, isolation),
- home environment (lack of conditions for learning at home).

The data concerning the type of parents' choices and the seriousness of the disadvantageous situation at the same time are displayed in Table 6. Based on the findings, the school A parents treat poor class management as the main disadvantage of distance learning. Their second major concern is reflected in technology-related problems making the whole learning ineffective, and the computer itself hardly ever replacing face-to-face contacts in a satisfactory way. Thirdly, the subjects mention no physical education classes leading to different health issues. When it comes to school B and its representatives, kids' isolation is considered to be the greatest disadvantage of distance-based instruction. Then, the group gives several characteristics of observed distance classes that are typical of poorly managed classrooms, such as discipline problems, table work or slow pace, and raises the issue of substituting physical education classes with mathematics or Polish resulting in an alarming lack of exercise among children. Finally, the subjects refer to the lack of dedicated IT skills as a substantial disadvantage. In a similar vein, the third research group starts their list from the teacher's unskillful lesson planning and no face-to-face interactions to technical problems and health disorders caused by physical strain as a result of extended screen time in place of physical classes.

[2] The statements underlined are shared by the representatives of two schools; the ones in bold reflect the opinions observed among the three schools.

Last but not least, the sample mentions no conditions for remote learning, whether it be housing conditions or the equipment responsible for partial or full exclusion.

Table 6

The Results. Part 4: Disadvantages

School A	School B	School C
1. too much for learners to do	1. isolation	1. „poor level"
2. chaotic organization of a lesson	2. ineffective	2. **slow pace of work**
3. **technical problems**	3. chaotic organization of lesson	4. **no contact with classmates**
4. **slow pace of work**	4. **no contact with classmates**	5. a limited contact with a teacher
5. **discipline problems**	5. lack of physical activity	6. too few activities done per day
6. **no contact with classmates**	6. **"table work**"	7. **technical problems**
7. doing everything at once	7. lowered teaching standards	8. too much time in front of the screen
8. teacher selectivity	8. **discipline problems**	9. lack of physical activity
9. **"table work"**	9. **technical problems**	10. no physical education classes
10. no physical education classes	10. **slow pace of work**	11. lack of conditions for online learning at home

S o u r c e: author's own work

Discussion of the Results

Taking into account all the data collected from parents of first-grade learners, it is clear that the *classroom management* matters a great deal to them, and is widely-criticized for teacher's inability to control the learners' behavior, and prevent them from being so undisciplined (mainly because of the lack of netiquette rules or breaking the rules already introduced). The second most disputed issue concerns time management, and teacher's problems with delivering classes on time, as well as shifting from one task to another. Yet another complaint is issued with regard to teacher's insufficient IT skills, more often than not resulting in screen sharing difficulties.

Following the results of the study, it is legitimate to say that the *classroom climate* matters a lot for the sample, especially the so-called mental space involving

"interaction between the teacher and learners, and between learners themselves, individual learner autonomy." (Gabryś-Barker, 2016, p. 164). All the groups under examination complain mostly about the teacher being very selective in his/her choice of learners to be active and responsive in the lesson. As a result, it is very often the case that a dozen of children never answer and remain passive, often overlooked by the teacher.

Accordingly, *the classroom content* that is under special parental supervision in a distance mode of learning leaves much to be desired. Based on the parents' opinions, the material presented in the lesson is not well-balanced. The teacher is believed to overdo writing and numeracy skills at the expense of reading considered fundamental in the first grade of primary education. What is neglected and devoted too little time to, on the other hand, refers to manual and social skills. However possible it is to first explain, and then, improve the very situation, nothing seems to justify the absence of physical education classes in distance learning that all the parents are so critical about.

The advantages of distance education at the primary level are the *atmosphere* considered less stressful and more friendly than in a traditional classroom, *children's safety* consisting in no exposure to the COVID-19 virus, and road hazards, as well as *new experience* involving a lot of individual work and decision making with gaining new computer skills.

The drawbacks, on the contrary, apart from the afore-mentioned *management failure*, range from the *lack of socializing* (exemplified by no face-to-face contact with the teacher and fellow colleagues) to *health problems* involving backaches, headaches or eye pain/strain at the end of a virtual lesson day/week.

Finally, the public vs private school comparison tends to lean slightly in favour of the former, both at the level of conduct and content management. The areas of parental dissatisfaction translating, at the same time, into disadvantages of off-site classes in a private sector involve a complete lack of physical activity and isolation that directly influence children's health condition and social skills respectively. It is evident that even better-funded and better-equipped institutions do not offer physical education classes to young learners, which seems to indicate the subject being a great challenge for schools.

Conclusion

To conclude, a lot has to be done to warm up the image of distance education at the elementary level. Based on the findings of the study, there is a great need to pay more attention to creating a positive atmosphere in the classroom.

Studies show that taking care of virtual classroom environments entails creating settings organized around the integration of social presence (the extent to which learners feel socially and emotionally associated with others in an e-learning environment), teaching presence (the plan, implementation, control and support for the achievement of individually meaningful and educationally valuable learning outcomes), and cognitive presence (the degree to which learners can verify meaning through supported reflection) (Banks, 2014; Banayo & Barlet, 2021). Second of all, more attention should be focused on developing teacher's and student's computer competence, understood as an ability work on computers as a means to communicate with others and obtain information, to make both sides of distance learning satisfied and convenient in operating computers (Banayo & Barlet, 2021). Third, professional development courses should be offered for teachers, such as distance learning courses in teaching, to name an example.

Implications

So far, I suggest paying attention to the ways that might improve the quality of distance education where it needs urgent response. What is at issue concerns promotion of training courses in classroom management using interactive, engaging techniques and reflective methods or a Teams application course for teachers.

Another suggestion is to prepare teachers for PE classes or short periods of in-class gymnastics/games to be delivered whilst lockdowns. An example could be a wheel of fortune fitness or a newspaper ball activity. The former consists in spinning the wheel to find out what exercise the whole group or an individual student is going to do, and performing it. The latter, for instance, might take on a form of a challenge of getting learners to scrunch a piece of paper into the palm of a single hand or simply a practice of children's throwing skills.

Further Studies

Taking into account the ideas for future studies, it is recommended to extend the research to cover more schools. Also, an interesting perspective would be to examine different types of schools as regards the level of education (a primary versus secondary and tertiary level), as well as compare schools referred to as the public and the non-public ones. As a result, the picture of distance education shown

in the present study may either be followed and/or elaborated on with the new data or rejected and/or approached in a totally new way.

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Marzena Wysocka-Narewska

Edukacja zdalna w szkole podstawowej – opinie i refleksje rodziców

S t r e s z c z e n i e

Niniejszy artykuł prezentuje wyniki badań kwestionariuszowych przeprowadzonych wśród rodziców uczniów pierwszych klas szkół podstawowych. W badaniach wzięło udział łącznie 60 osób z trzech szkół podstawowych zlokalizowanych na Górnym Śląsku (w tym dwóch szkół publicznych i jednej niepublicznej). Głównym celem zaprojektowanych ankiet było zebranie informacji dotyczących szeroko pojętej organizacji lekcji zdalnych podczas pierwszego lockdownu w czasie epidemii COVID-19. Ocenie rodziców podlegało m.in. planowanie zajęć, zarządzanie klasą, realizacja materiału z uwzględnieniem wszystkich składowych edukacji wczesnoszkolnej, zachowanie uczniów oraz sposoby radzenia sobie z sytuacjami problematycznymi pojawiającymi się podczas nauki na odległość. W części finalnej ankietowani zostali poproszeni o wytypowanie korzyści, które niesie za sobą praca z pierwszoklasistami w systemie zdalnym oraz mankamentów nauki zdalnej. Autorka, w odpowiedzi na refleksje badanych, proponuje kilka wskazówek, które mogą pomóc w rozwiązaniu najbardziej problematycznych kwestii w obu typach szkół.

S ł o w a k l u c z e : nauka zdalna, etap szkoły podstawowej, opinie i refleksje rodziców, COVID-19

Marzena Wysocka-Narewska

Educación a distancia en el nivel de educación primaria: opiniones y reflexiones de los padres

Resumen

Este artículo presenta los resultados de una encuesta realizada entre padres de alumnos de primer año de primaria. Un total de 60 personas de tres escuelas primarias ubicadas en la Alta Silesia (incluidas dos escuelas públicas y una privada) participaron en la investigación. El objetivo principal de las encuestas diseñadas fue recopilar información sobre la organización ampliamente entendida de lecciones remotas durante el primer confinamiento durante la epidemia de COVID-19. La evaluación de los padres estaba, entre otras cosas, sujeta a planificación de clases, gestión del aula, implementación de materiales teniendo en cuenta todos los componentes de la educación infantil, el comportamiento de los estudiantes y las formas de enfrentar las situaciones problemáticas que se presentan durante la educación a distancia. En la parte final, se pidió a los encuestados que seleccionaran los beneficios de trabajar con alumnos de primer grado en el sistema remoto y las deficiencias del aprendizaje remoto. El autor, en respuesta a las reflexiones de los encuestados, sugiere algunos consejos que pueden ayudar a resolver las cuestiones más problemáticas en ambos tipos de escuelas.

Palabras clave: educación a distancia, etapa primaria, opiniones y reflexiones de los padres, COVID-19

Мажена Высоцкая-Наревская

Дистанционное обучение на уровне начального образования: мнения и размышления родителей

Резюме

В данной статье представлены результаты анкетирования, проведенного среди родителей первоклассников начальных классов. Всего в исследовании приняли участие 60 человек из трех начальных школ Верхней Силезии (включая две государственные и одну частную школу). Основной целью разработанных опросов был сбор информации о широко понимаемой организации дистанционных уроков во время первого карантина во время эпидемии COVID-19. Оценка родителей, в частности, планирование занятий, организация занятий, реализация материала с учетом всех составляющих дошкольного образования, поведения учащихся и способов выхода из проблемных ситуаций, возникающих при дистанционном обучении. В заключительной части респондентам было предложено выделить преимущества работы с первоклассниками в дистанционной системе и недостатки дистанционного обучения. Автор, отвечая на размышления респондентов, предлагают несколько советов, которые могут помочь в решении наиболее проблемных вопросов в обоих типах школ.

Ключевые слова: дистанционное обучение, начальная школа, мнения и размышления родителей, COVID-19

III. Theoretical, Methodological and Practical Aspects and Psychological Determinants of ICT and E-Learning in Education

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Alina Betlej
The John Paul II Catholic University of Lublin, Poland
https://orcid.org/0000-0002-2729-6564

Alina Danileviča
Daugavpils University, Latvia
https://orcid.org/0000-0002-2749-2725

Learning Technologies for People with Mild Intellectual Disabilities From Digital Exclusion to Inclusive E-education in Network Society

Abstract

The research focuses on the issue of learning technologies for people with mild intellectual disabilities. The analysis carried out is grounded in the theses of the network society. The initial objectives addressed three main issues: analysis of risks of digital exclusion of people with mild intellectual disabilities in highly technological developed societies; a conceptual view of learning technologies as tools to support social inclusion; and the importance of creating accessible e-learning environments to support inclusive e-education for people with mild intellectual disabilities. The authors used the analytical and descriptive method on the basis of the chosen literature sources to draw the conceptual view of functions of learning technologies in network society. The paper is structured as follows: introduction; analysis of theoretical background of network society to understand the need to go beyond technology to understand contemporary digital disparities; the overview of learning technologies for inclusive e-education for individuals at risk of digital exclusion, the research conclusions and directions for future research.

K e y w o r d s: learning technologies; people with mild intellectual disabilities; network society; inclusive e-education, digital exclusion

The disability reports and many research findings confirm that over one billion individuals worldwide live with some disabilities (Mitra et al., 2021; AAIDD, 2020). In addition, it is estimated that school-age children with disabilities are approximately 150 million and many of them are deprived of primary education. It is claimed that approximately 200 million people worldwide have intellectual disability (ID) (AAIDD, 2020; Bircanin et al, 2021; Gajdzica et al., 2021). This represents 2.6% of the world's population, and of those about 85% have mild intellectual disability (MID). Diagnosis of ID often results in lifelong stigmatisation, social exclusion and limitation of human rights. Accepted diagnostic criteria for intellectual disabilities encompass behavioural, cognitive, as well as developmental issues. The WHO defines it as "a significantly reduced ability to understand new or complex information and to learn and apply new skills (impaired intelligence)" (AAIDD, 2020). We use this term when an individual has certain cognitive limitations and other competence deficits. The examples include social competence, communication skills and the level of self-care independence. These limitations may have a negative impact on the development of the child, who may be slower to acquire knowledge, unlike a typically developing child. Intellectual disabilities may be considered to include problems with an individual's general mental abilities. These affect an individual's functioning in two core areas. The first is her or his intellectual functioning, i.e. learning, problem solving, judgement. The second one is his/her adaptive functioning, i.e. various activities of daily living, such as communication and independent living. These characteristics are consistent with the American Association of Intellectual and Developmental Disabilities, which accepts that an individual has intellectual disabilities if he or she meets three essential criteria (Mitra et al., 2021). His or her IQ is below 70–75. He or she is considered to have important constraints in two or more adaptive fields (life, work, activities in a community). These problems usually start to appear before the age of 18.

The label of ID transforms into the individual's primary identity and in many cases it becomes more socially important that the other identities such as gender, sexuality and ethnicity. It is accepted in the literature that five levels of intellectual disability are most commonly manifested: 1.Profound (IQ < 20); 2. Severe (IQ 20–34); 3.Moderate (IQ 35–49); 4.Mild (IQ 50–69); and 5. Borderline intellectual functioning (IQ 70–84). For example, mild intellectual disability (formerly known as mild mental retardation) refers to deficits in intellectual functions relating to abstract/theoretical thinking (Mitra et al., 2021). This occurs in approximately 1.5 % of the population (AAIDD, 2020). Additional cognitive functions are usually also impaired, leading to deficits/disorders in other areas. The most commonly cited symptoms of an individual's mild intellectual disability include: taking a long time to learn to speak, but communicating well once she or he knows how; being fully independent in caring for herself or himself as she or he gets older; problems with reading and writing; social immaturity; increased difficulties

with the responsibilities of marriage or parenthood; use of specialised education plans; an intelligence quotient between 50 and 69 (AAIDD, 2020; Kennedy et al., 2011). Individuals with ID are extremely diverse in many ways. The aetiology of disability is very complex. The examples include physical (20–30%) and sensory disability (10–33%), which in many cases appear apace with perceptible, operative and educational limitations. The definitions of intellectual disability have most often focused on deficits (Buchnat et al., 2016; Brereton et al., 2015). It should be noted that this approach has changed over the last decade. It is increasingly emphasised that ID is an example of the social construction of humanity's reality. This concept is immersed in a specific historical and cultural context, which implies a peculiar labelling of this category of people in society (Gajdzica, 2020; Gajdzica et al., 2021). Moreover, nowadays we see the shift in thinking about disabilities (Rembierz, 2021 a). It is stressed that the recognition of limitations is an essential element of the support process. The trend is on highlighting people's strengths (Betlej, 2022).

On the contrary, many studies indicate that people with intellectual disabilities are still facing many obstacles, as education and information access, no employment probability despite their potential for social integration (Cano, 2016; Haug, 2017; Morze et al., 2014). They also would appear to be particularly vulnerable to digital exclusion in today's technologically advanced societies (Vasilyeva et al., 2021; Betlej, 2017; Chadwick et al., 2017). The inclusion movement of individuals with ID was initiated worldwide many years ago (Balasuriya et al., 2022; Bennett et al., 2018). In the European Union social integration of people at risk of digital exclusion is a priority issue (Gajdzica, 2020; Haug, 2017). Many challenges can be discussed in relation to inclusion of children with ID in school classrooms(Hornby, 2014; Hornby, 2015). One of the more popular contemporary approaches is collaborative learning in the classroom, where each child is encouraged to make a contribution to the group. Jointly organised activities have also proved effective in promoting the integration of children with ID out of the class especially during the leisure time. Similar findings were also noted in programmes that used sport as a platform to support the social inclusion of children with ID.

Similar assumptions are made in research on digital exclusion of adults at risk of digital exclusion (Betlej, 2022; Boot et al., 2018). New technologies (ICT, AI) seem to be underestimated tools in supporting the process of sustainable social integration of people with ID and their lifelong e-education (Betlej, 2020). Developments in technology can enable individuals to improve their quality of life. The effective use of such technologies can help to make the classroom space more suitable for students with special educational needs. Digital tools effectively support the process of creating content and improving teaching techniques, as well as the learning process itself. Most importantly, geographical and economic barriers to extending their competences may become less important. The development of these tools offers particular opportunities for e-education of adults already

in the labour market. In fact, the continuous advancement of information and communication technologies has created the need to improve the quality of learning and increase the availability of learning technologies usable in formal education, training and individual home learning systems by providing new viewpoints and probabilities (Morze et al., 2016). E-learning is emerging as a response to this need and guarantees to meet the learning needs of individuals in a personalised and inclusive manner in technological societies (Morze et al., 2014).

In this paper we analyze the issue of learning technologies for people with mild intellectual disabilities. The analysis carried out is grounded in the theses of the network society. This is a special category of individuals in many respects. As shown in the introduction, mild intellectual disability does not usually prevent people from performing everyday activities such as dressing, personal hygiene or taking meals. Individuals with MID usually have little difficulty in communicating with others and maintaining conversation. Very often they are socially resourceful. Many people with MID can do professional work. Providing them with learning technologies to support their e-education can contribute to their full social inclusion. Thus, our analysis captures new aspects of the social inclusion process for people at particular risk of digital exclusion. The focus on the creation of accessible e-learning environments aims to support them in life-long learning by adapting the process to their needs.

We also explore the challenges of e-education for people with MID related to rapid technological development and transformations resulting from digitisation. We use an analytical and descriptive method on the basis of the chosen literature sources. The paper is structured as follows: section 1 outlines the theoretical background of network society to understand the new risks of digital exclusion for people with mild intellectual disabilities. Section 2 provides an overview of the learning technologies for inclusive e-education for individuals at risk of digital exclusion, while in the the end the conclusions of the research and directions for future research are highlighted.

Digital Exclusion: Beyond Technology

Manuel Castells' concept of the network society, despite its numerous weak points and shortcomings, provides interesting tools for analysing a transformation process from digital exclusions to inclusive e-education of people with MID in many respects (Betlej, 2019). It is an exceptionally extensive template showing the relations between various types of social reflections on social divides. The network model has become a kind of battlefield for the sustainable tomorrow of humanistic civilization. Labelling societies and setting development trends based

on the observation of trends in technical progress is not a *novelty* in social thought. Castells, however, happened to capture important perspectives on social changes. He focused on the description of specific properties of new technologies that have their social determinants. Tightening social bonds, interactions, communication, creating structures, redefining cultural assumptions, gathering information and knowledge, social control – all these concepts have been translated into the language of network analysis (Gondek, 2020). In a sense, one has to admit that no other contemporary perspective referring to technical categories is so epistemologically comprehensive. Analysing change by referring to a technicalised perspective (digitisation, virtualisation, networking, hyperconnectivity) opens up fields of analysis of essential issues such as social divides and developmental risks (Lavrinenko et al., 2022). Technologies are social. Society therefore resembles technology in this perspective. Questions are increasingly being asked about humanity's global security in a world of technically mediated paradoxes (Chojnacki, 2021). The category of social bonds, communication or relations has been functioning for years in sociological thought (Rembierz, 2021 a). It does not appear that man will change the way he/she enters society even more radically in the next few years. The idea of social technologies seems to meet the criteria of learning technologies and find application in forecasting various models of e-education of people with intellectual disabilities (Rembierz, 2021 b). The category of learning technologies refers to the changes in the field of science, the design of society, the social construction of technology and technical innovations and their impact on social changes (Andrade et al., 2022; Bayor, 2019).

Network society concept draws the interesting perspective for analysis of different models of social exclusion. Social aspects of technological driven transformations are of great relevance in a virtually immersed world (Rembierz, 2015; Dancák, 2017; Mariański, 2020). The network society can be characterised by two key features (Castells, 2010). The first is the ability to reproduce and institutionalise networks. The second characteristic is its technological mediation and dependence to an unprecedented level on the operation of new network technologies related to the production and processing of information and knowledge (van Dijk, 2012). Network technology is very different from the past solutions, changing the social experience of space and time (temporal-spatial compression), geography (deterritorialisation), decentralisation and control, and interactivity (Castells, 2012). Digital skills and access to new technologies influence the individual and social potentials of participation in consumption, culture, democracy, education and entertainment (Betlej, 2019). The network society is based on information transfer. In this socio-economic whole, the greatest value, or source of value, becomes the network itself and its features. The traditional boundaries of social differentiation seem to be shifting towards much more intangible determinants of people's position and quality of life. Limited access to networks and new technologies is the most frequently cited example of

sources of development disparity (Aleksejeva et al., 2021; Androniceanu et al., 2020; Bedianashvili, 2021). In a social world dependent on new technologies, we witness a diversification of traditional social divisions. The determinants of a social position of individuals are not only material issues. The quality of life of people also depends on their competences in using digital devices and processing data, understanding them and the ability to distinguish information from propaganda (Betlej, 2020). Limited access to networks and new technologies is still one of the most frequently cited examples of the determinants of social exclusion. However, the importance of soft skills related to the ability to use new technologies in education and the development of lifelong learning competences is increasingly highlighted (Dancák, 2017; Kennedy et al., 2017).

Connecting to the Internet is a key stage in the contemporary socialisation process of socio-demographically diverse individuals (Szpunar, 2012). Age is no longer a key factor in the analysis. Access to information, education, as well as the power and possibility to co-create digital content and thus influence the social world, requires the improvement of many hitherto undervalued competences (Smyrnova-Trybulska et al., 2016; Betlej, 2022). Digital exclusion, defined not only by access to new technologies, but above all by deficiencies in the ability to evaluate digital content, to understand the new rules of the game, to educate and to access the co-creation of digital resources, will result in very serious social consequences for those rejected from technologically mediated societies. The traditional variant of the digital exclusion analysis looked primarily at the importance of the Internet and ICT access (see Table 1).

Table 1
Social divisions in the network model of society. Traditional variant

Social divisions in the network model of society Traditional variant	
Connection to the network:	Lack of connection to the network:
access to new technologies,	novelty and types of technologies used,
high level of technical competences,	low level of technical competences,
high level of social competences,	low level of social competences,
fast adaptation to changes,	slow adaptation to changes,
high income,	low income,
age of users, place of residence.	age of users, place of residence.

S o u r c e: own study based on: Betlej, A. (2019). *Społeczeństwo sieciowe– potencjały zmian i ambiwalentne efekty*. Wydawnictwo KUL, p.235.

In this theoretical perspective, digital exclusion, as well as many of its determinants listed above, will affect the employment, education and social participation opportunities of participants in technologised societies. The performative potential of social actors is considered as an important factor for radical social change in the near future. Technological enhancement does not abolish classic social divisions. It gives them new content and, in effect, implies in a sense previously unknown principles of social stratification. The importance of cultural factors is increasing in these processes. A change in the perspective of the individual and the aspect of his or her re-empowerment in the spirit of humanist assumptions is also apparent. Assessing social divisions from this perspective leads to numerous ambivalences. The process of networking, knowledge production and global alignment of meanings will trigger various phenomena. In this view, being networked does not ultimately determine an individual's position in the power structure. The category of the digitally excluded can be broadened to people who are connected and moreover well-functioning in the social, professional and technological spheres (see Table 2).

Table 2
Digital exclusion in the network model of society. Ambivalent variant 1. Excluded people with connection

Digital exclusion in the network model of society Ambivalent variant 1. Excluded people with connection	
Excluded people with connection:	Elites – Not connected to the network:
alternative exchanges of information resources,	knowledge networks, power networks,
low level of social performativeness,	classic actors of change (e.g. mafia--oligarchic systems),
informal circuits of culture,	creators of new technologies,
cyberhacktivism, alternative network spaces,	prominent individuals,
individuals, social groups,	new social movements,
social networks,	technosocial systems,
naive cyber-consumers.	digital refugees.

S o u r c e: own study based on: Betlej, A. (2019). *Społeczeństwo sieciowe– potencjały zmian i ambiwalentne efekty*. Wydawnictwo KUL, p. 237.

Individuals with MID are particularly at risk of digital exclusion. The Internet and new technologies create an extremely effective environment for their social activity and education. On the contrary, many negative aspects of online presence of people with MID might be discussed (Szpunar, 2021). They are particularly

vulnerable to many risks due to their undeveloped learning abilities. Cognitively inaccessibility of education content may be considered as the effect of the most important barriers to Internet and computer access (see Table 3).

Table 3
Barriers to Internet and Computer Access for People with Mild Intellectual Disabilities

Barriers to Internet and Computer Access for People with Mild Intellectual Disabilities	
Individual:	Social:
educational barriers,	financial constraints and economic barriers,
language and communication abilities,	societal attitudes, social exclusion,
auditory reception abilities, reasoning abilities, idea production abilities, cognitive speed abilities, memory and learning skills abilities, visual perception abilities,	contextual factors that impact on training and support from family carers and other direct stuff (views, experience, digital skills, knowledge),
knowledge and achievement abilities	lack of inclusive policies; lack of government support
lack of interest in developing digital skills(attitudes)	cultural barriers (values, superstitions, interpretation schemes, norms, images of people with MID etc.)
Internet content	technology design
lack of family carers' support (attitudes)	rapid technological development, digital disparities
lack of direct support from training staff (attitudes)	environmental barriers

S o u r c e: own study based on: Betlej, A. (2019). *Społeczeństwo sieciowe– potencjały zmian i ambiwalentne efekty*. Wydawnictwo KUL. Kennedy, H., Evans, S., & Thomas, S. (2011). Can the Web Be Made Accessible for People with Intellectual Disabilities? *The Information Society* 27, 1, 29–39.

Access to the Internet and computer may provide many opportunities for people with mild intellectual disabilities. Despite the mentioned barriers, there are many opened up avenues for education, learning, self-expression, networking, working, entertainment and self-advocacy. The socializing aspects seem to be of the most interest of social scientists. So far in literature the main topics of discussions have been the potential opportunities for people with MID to create and sustain social relationships online that transcend the individual's disability, allowing them to develop an identity as an independent person and transcend social distance (Szulc, 2020). Development of Internet content could lead to reducing social stigma of a person with MID. Moreover, the perceived benefits are

possibilities of expressing self-identity among online citizens. Previous research includes descriptions of people with MID as social media users (Kennedy et al. 2011). Their networking activities are interpreted as milestones to reduce social inequalities. Internet and computer access are often analysed in terms of key factors in strengthening their self-determination and self-advocacy on a global scale. Promotion of positive attitudes towards people with MID may lead to social changes in cases of developing support strategies for people with special needs as well as addressing their needs by technology designers.

Network society is open and innovative (Betlej, 2019). Traditional causality and continuity disappear and an accidental infosphere appears here. The advantages of social networking in shortening social distances and counteracting social exclusion of people with special educational needs is a very frequently addressed topic of research. The second extremely important aspect is also addressing the topic of participation in the process of creating online content and understanding the networked logic of functioning in technological societies. The use of sophisticated technologies allows for an extraordinary intensification of information production and processing in key areas of socio-economic activity, such as rationality-based learning, the information economy, the knowledge-based labour market, and culture dominated by media products (van Dijk, 2012). People with MID who have access to the Internet and a computer and who actively participate in social media are also potentially at risk of digital exclusion if their education does not address the issue of understanding online content. The development of digital skills in networked societies cannot be limited to learning only the technical aspects. The focus should be on the social and educational side, leading to the shaping of modern, inclusive e-education. Learning technologies can become effective tools for the education and development of people with MID. Going beyond technology is a starting point in understanding the multidimensional risks of digital exclusion in a network society. Applying the potential of social technologies could help to enhance learning opportunities for people with special needs.

Learning Technologies: Crossing the Line

Accelerated advances in information and communication technologies (ICT), assistive technologies with the Internet at the foreground, significantly change the opportunities for learning and social interaction (Morze et al., 2014). The number of people using mobile devices on a daily basis continues to grow (Doughty et al., 2013). Thus, being digitally connected is becoming essential to personal and social development in different environments. Internet access is considered as universal and undeniable (Dobosz et al., 2018). However, learning technologies is

a broader concept than the Internet and encompasses many specialised programmes, applications and solutions for specific audience categories (Betlej, 2019; Buchnat et al., 2020). People with MID can, in many cases, benefit significantly from access to modern technological developments. It should be stressed that the great potential of these is seen in helping individuals in better integration into society and experiencing various benefits of full citizenship. New technologies offer the promise of reducing or removing many of the barriers that limit their educational opportunities, as well as their self-development and well-being.

New technological solutions that can assist people with MID include many others that are not widespread on a mass scale. Assistive, supportive or enabling technology include devices, tools, equipment, alongside with software and hardware that partially enable people with certain disabilities to use a computer. Although computers and computing devices come to mind when we think of assistive technology, it can also be very low-tech, like pencil grips. These types of devices create a different way of accessing content on the screen, giving commands to the computer or processing data. Assistive technology supports individual and inclusive learning and makes it easier to bypass difficult tasks such as handwriting. (Kennedy et al., 2011). It should be considered as an effective tool of enhancing writing skills of individuals with special educational needs (Dobosz et al., 2018). People with MID in many cases have difficulty in writing and reading effectively, as well as remembering content. Assistive technology could support the avoidance of these technical conditions of writing and other specific cognitive competences. Using spell-checking and grammar-checking qualities can help individuals focus on communicating their thoughts. Specific adaptive software or computer manipulation devices include inter alia:

- Screen reading software (speaks the displayed text, simulates mouse actions with the keyboard);
- Text-to-speech software, such as Kurzweil 3000, can read digital or printed text aloud. This digital tool provides many opportunities for effective learning. People with MID are more likely to understand a text when unfamiliar words are read to them. Text to speech has a positive effect on interpretation and word perception. It also impacts reading fluency and comprehension. -screen magnification software (to enlarge the content of the screen). The use of the Kurzweil 3000 software also improves people's perception of learning itself and their individual assessment of their expressive writing skills. Important in this context is the aspect of emotions and the individually perceived well-being of people for whom reading and writing is no longer linked to the experience of frustration;
- Speech-to-text – People with MID have some transcriptional limitations and therefore show difficulties with handwriting, spelling, punctuation, difficulties in learning grammatical rules. In opposition to this, they often develop good composition skills that enable them to plan, create content and revise it. Speech

recognition software transcribes the spoken word into computer text. The user therefore does not have to type or handwrite independently. People with MID can create longer and more complex stories with fewer errors thanks to this solution (e.g. XpressLab). In addition, voice recognition software can improve word identification, spelling and comprehension skills for people with learning disabilities;
- Braille display (to display Braille characters);
- Alternative input devices (e.g. on-screen keyboard) and special keyboard (to facilitate data entry);
- Keyboard enhancements and accelerators (such as StickKeys, Mousekeys, repeatKeys, SlowKeys, BounceKeys or ToggleKeys), mnemonics and keyboard shortcuts;
- Assistive robots and robotics equipment validated to improve the learning opportunity;
- Alternative pointing devices (e.g. foot-operated mice, head-mounted pointing devices or eye tracking systems);
- Mid-tech devices- audio recorders, porTable note takers, mp3 players, calculators, and pentop computers.

Assistive technology is often discussed by domain (Smyrnova-Trybulska et al., 2020). The types of devices listed are cited in the literature as examples of learning technologies for people with learning disabilities. These are helpful for people with ID for a number of reasons, not least because they support the process of writing, reading and logical thinking. It should be noted that rapid technological progress is constantly being made in this area. There are still many relatively simple technological solutions available on the market to support learning processes by benefiting receptive, speaking, reading, writing, reasoning and math skills (see Table 4).

Table 4
Examples of Assistive Technology by Domain. Low- to mid-tech

Examples of Assistive Technology by Domain Low- to mid-tech				
Speaking	Reading	Writing	Reasoning	Math
Cue cards	Highlighter strips	Pencil grips Computerized pens	Graphic organizers	4-function calculator

S o u r c e: own work based on: Tsikinas, S., & Xinogalos, S. (2018). Designing effective serious games for people with intellectual disabilities. *IEEE Global Engineering Education Conference (EDUCON)*, pp. 1896-1903; Hornby, G. (2014). *Inclusive Special Education: evidence-based practice for children with special educational needs and disabilities*. New York: Springer; Brereton, M., Sitbon, L., Haziq Lim Abdullah, M., Vanderberg, M., & Koplick, S. (2015). Design after design to bridge between people living with cognitive or sensory impairments, their friends and proxies. *CoDesign* 11 (1) , 4–20.

The market of new technologies is very diverse in terms of the technical parameters of learning technologies. A very extensive branch of it is intermediate devices supporting the development of key competences. These digital devices are also relatively easily accessible to potential end users (see Table 5). People with MID are regarded as disadvantaged groups with limited economic resources. Empirical evidence from a number of studies confirms that economic factors are important variables in access to technology.

Table 5
Examples of Assistive Technology by Domain. Mid- to high-tech

Examples of Assistive Technology by Domain Mid- to high-tech			
Reading	Writing	Reasoning	Math
Kurzweil 3000	Word processing	Inspiration Spark-Space	Graphing calculator IXL Math

S o u r c e: own work based on: Tsikinas, S., & Xinogalos, S. (2018). Designing effective serious games for people with intellectual disabilities. *IEEE Global Engineering Education Conference (EDUCON)*, pp. 1896-1903; Hornby, G. (2014). *Inclusive Special Education: evidence-based practice for children with special educational needs and disabilities*. New York: Springer; Brereton, M., Sitbon, L., Haziq Lim Abdullah, M., Vanderberg, & M., Koplick, S. (2015). Design after design to bridge between people living with cognitive or sensory impairments, their friends and proxies. *CoDesign* 11, 1 (2015), 4–20.

A contemporary trend is the development of applications for mobile devices. These solutions are becoming more common due to the high popularity of smartphones and touch screens (see Table 6). These tools are also readily available, although economic issues, such as in some cases the purchase of licences and other usage costs, can become a barrier. The use of mobile applications comes with the potential for a number of cyber threats. These devices' complexity is often perceived as a barrier to Internet use. There is a need for universal design principles development. Barriers to accessing and using learning technologies should be considered from the perspective of the individual user. Differential cognitive, physical and sensory impairments associated with intellectual disabilities may be important factors. The barriers leading to challenging educational problems are related with specific language and communication ability, as well as auditory reception, reasoning, memory visual perception, etc. Impairments affecting literacy and reading comprehension become very problematic when assimilating electronic content, e.g. words with multiple meanings (window, menu, files). Using applications for mobile devices requires a level of sequential reasoning, but these tools seem to meet the needs of people with MID despite the mentioned barriers.

Table 6
Examples of Assistive Technology by Domain. Apps for Mobile Devices

Examples of Assistive Technology by Domain Apps for mobile devices				
Speaking	Reading	Writing	Reasoning	Math
ShowMe Interactive Whiteboard	Speak Selection GoodReader	Pages iWordQ Dragon Dictation	SimpleMind+	ShowMe ScreenChomp

S o u r c e: own work based on: Kennedy, H., Evans, S., & Thomas, S. (2011). Can the Web Be Made Accessible for People with Intellectual Disabilities? *The Information Society* 27 (1), 29–39; Doughty, T., Bouck, E., Bassette, L., Szwed, K. & Flanagan, S. (2013). Spelling on the fly: Investigating a pentop computer to improve the spelling skills of three elementary students with disabilities. *Assistive Technology, 25,* 166–175.

The examples described support the thesis that assistive technologies can be either devices or equipment (hardware), e.g. Braille, and software applications, e.g. screen reading software (Young et al., 2014). This raises the question of whether these technologies are sufficient to provide full support for people with MID. In this respect, it must nevertheless be noted that these devices do not meet their needs of living in highly technological societies. The inclusion of people at risk of digital exclusion requires a new approach. The barriers to the access to new learning solutions despite the evaluation of its technological advancement, are not always effects of financial constraints. Accessibility demands for people with MID have often been ignored or misunderstood. The invisibility of this group to the general public seems to be unquestioned. Many learning technologies are cognitively inaccessible for those potential end-users. Despite the knowledge on benefits from new technologies people with MID seem to be not included in the designing process (Tsikinas et al., 2018). In addition, they are rarely found in leadership or decision making on Internet policy positions in organisations. Internet content providers should also be involved in the process of including them by introducing solutions that take into account the specificities of people with intellectual disabilities when creating online content (Tsikinas et al., 2020). We can refer to the examples of efforts taken around the world to address this issue, like the benefits of artificial intelligence for learning. What needs to be underlined, the design should be considered as a core of inclusive learning technologies.

Based on this premise, accessible and advanced e-learning should be linked directly to the project features. The technical specificity of these solutions facilitates online learning that is accessible to everyone, regardless of their disability. (Smyrnova-Trybulska et al., 2016). In addition, the process should also take into account more mediators of learning. The mode of implementation also interacts with the learning process. The analysis of unnecessary barriers to his/her interaction with a computer or connecting device is crucial in the development of people-

-friendly technologies (Szulc, 2020). Accessibili ty should be recognised as a key element in the design of technology-assisted training systems (Bayor et al., 2021). The trend in learning technologies is mobile applications development with AI enhancement. Individuals with intellectual disabilities witness many constraints in this respect. Thus, the future and humanistic oriented solutions are focused on promoting people with MID in accessing, using and interacting with the Internet through e.g. the Web Accessibility Initiative by developing strategies, guidelines and specific resources (Balasuriya et al., 2019). All solutions are based on Web Content Accessibility Guidelines, authoring tools and user agent. The Internet accessibility model is based on the four criteria (Bennett et al., 2018):

1. Perceivable – information and user interface elements must be presented to users in a way that they can perceive.
2. Operable – user interface elements and navigation must be operational.
3. Understandable – information and operation of the user interface must be comprehensible.
4. Robust – the content must be sufficiently robust to be reliably interpreted by a wide variety of user agents, including assistive technologies.

Since e-education is one of the major concerns of new technologies as a tool of social inclusion of people at risk of digital exclusion, applying their standards in this domain is very promising. Social inclusion of people with mild intellectual disabilities should be broadly viewed with support for the innovation development and adoption of learning technologies. Despite many controversies and challenges these solutions are of great importance for inclusion of disempowered people and based on humanistic thinking and solidarity values. In our increasingly digital world the power of universal values is still underestimated, as well as the potential of social technologies (Rembierz, 2021; Mariański, 2020).

Conclusions

Technological invasion causes social, economic and axiological transformations in networked societies. It changes the understanding of the right to education, self--development and citizen participation in social activities. The dominant mechanism of changing the direction of interpreting the axiology of the economy of relations is not only the market monetization of digitized information, data and knowledge. The new models of digital exclusion go beyond the technology to underline the importance of creative humans' presence in development of digital content. Questions about the performative potential of individuals with mild intellectual disabilities in network society will intensify as technology continues to expand.

Democratic hopes for sustainable social development, placed in the increasing speed and efficiency of the Internet, are becoming obsolete. Users, aware of new technologies, with an appropriate potential of access authority, will give up certain technological amenities in favour of the controversially understood freedom. It ought to be admitted that in the future, cultural conditions will further intensify the tendencies of social differentiation in technologically connected societies. As described by Manuel Castells, there is an observable trend towards technological dependence in developed countries. Subsequent networking prospects will be diversified. The dispersion of information in the network has a superficial character.

Descriptions of new technologies increasingly focus on the integration properties of the medium as a tool for inclusive e-education of people with mild intellectual disabilities. The examples of such phenomena are learning technologies and efforts in developing accessible e-learning environments which consist of design, implementation and validation phases (Kennedy et al., 2011). The inclusion of accessibility in e-education is not only to guarantee the opportunities offered by the e-learning paradigm for all, including people with intellectual disabilities. It is also important to realise the full potential of learning technologies beyond social media participation (Betlej, 2019)A. Inclusive e-education cannot only support the removal of barriers experienced by people with MID in accessing digital resources online. Effective use of learning technologies would mean that technological resources would be used by learners of all ages, despite physical and technical barriers, by adapting devices to individual user styles and preferences (Brereton et al., 2015).

The study showed that many daily learning problems can be considered as similar for younger as well as older users, such as difficulties with reading, writing, abstract thinking, etc. What is important, the focus should be on the different strategies to overcome the mentioned problems. In this context, the age category will be crucial in analysing the adaptation of technical innovations to the needs and adaptability of people at different stages of life. Assessing learning technologies in relation to age and learning strategies has the potential to increase usability and design of digital solutions to people with special educational needs. The design of such solutions should therefore not only take into account the latest trends in new technologies. User interfaces and assistive features should be adapted to the learning strategies of people of different ages. Learning tasks involving assistive technologies will then be more effective.

Future research should focus on a micro-level approach and explore the specific needs associated with the use of such devices. In addition, an important question is whether people with MID are interested in participating in the learning technology design process. The authors plan to conduct in-depth interviews with people in MID. Essential questions would be about perceptions of self-development opportunities through the use of learning technologies and familiarity with commercially available solutions. As part of the next phase of the research, the authors plan to conduct focus

groups to get knowledge about their experiences with using learning technologies as well as their expectations towards the design of these tools.

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Alina Betlej, Alina Danileviča

Technologie uczenia się dla osób z lekką niepełnosprawnością intelektualną Od wykluczenia cyfrowego do e-edukacji włączającej w społeczeństwie sieciowym

A b s t r a k t

W niniejszym artykule podjęto problem rozwoju technologii uczenia się dla osób z lekką niepełnosprawnością intelektualną, opisany w teoretycznych ramach społeczeństwa sieciowego. Badania koncentrują się na zagadnieniu technologii uczenia się dla osób z lekką niepełnosprawnością intelektualną. Przeprowadzona analiza jest ugruntowana w tezach społeczeństwa sieciowego. Cele wstępne dotyczyły trzech głównych zagadnień: analizy zagrożeń wykluczeniem cyfrowym osób z lekką niepełnosprawnością intelektualną w wysoko rozwiniętych technologicznie społeczeństwach; konceptualnego spojrzenia na technologie uczenia się jako narzędzia wspierające integrację społeczną; oraz znaczenia dostępnych środowisk e-learningowych dla wspierania e-edukacji włączającej w wypadku osób z lekką niepełnosprawnością intelektualną. Autorki zastosowały metodę analityczno-opisową na podstawie wybranych źródeł literaturowych, aby nakreślić konceptualny pogląd na funkcje technologii uczenia się w społeczeństwie sieciowym. Artykuł ma następującą strukturę: wprowadzenie; analiza teoretycznych podstaw społeczeństwa sieciowego; przegląd technologii uczenia się dla włączającej e-edukacji dla osób zagrożonych wykluczeniem cyfrowym, wnioski badawcze i kierunki przyszłych badań.

S ł o w a k l u c z o w e: technologie uczenia się; osoby z lekką niepełnosprawnością intelektualną; społeczeństwo sieciowe; e-edukacja włączająca, wykluczenie cyfrowe

Алина Бетлей, Алина Данилевича

Технологии обучения для людей с легкой умственной отсталостью От цифровой изоляции к инклюзивному электронному образованию в сетевом обществе

Аннотация

Исследование посвящено проблеме технологий обучения для людей с легкой умственной отсталостью. Проведенный анализ основан на тезисах сетевого общества. Первоначальные задачи касались трех основных вопросов: анализ рисков цифровой изоляции людей с легкой умственной отсталостью в высокотехнологичных развитых обществах; концептуальный взгляд на технологии обучения как инструменты поддержки социальной интеграции; важность создания доступной среды электронного обучения для поддержки инклюзивного электронного образования для людей с легкой умственной отсталостью. Авторы использовали аналитический и описательный метод на основе выбранных литературных источников, чтобы составить концептуальное представление о функциях технологий обучения в сетевом обществе. Работа построена следующим образом: введение; анализ теоретических предпосылок сетевого общества для понимания необходимости выйти за рамки технологий для понимания современных цифровых различий; обзор технологий обучения для инклюзивного электронного образования для лиц, подверженных риску цифрового исключения, выводы исследования и направления будущих исследований.

Ключевые слова: люди с легкой умственной отсталостью; сетевое общество; технологии обучения; инклюзивное электронное образование, цифровое исключение; люди с легкой умственной отсталостью.

Alina Betlej, Alina Danileviča

Tecnologías de aprendizaje para personas con discapacidad intelectual leve De la exclusión digital a la educación electrónica inclusiva en una sociedad en red

Resumen

La investigación pretende investigar el problema de las tecnologías de aprendizaje para las personas con discapacidad intelectual leve en el marco teórico de la sociedad en red. Los objetivos iniciales abordan tres cuestiones principales: el análisis de los riesgos de exclusión digital de las personas con discapacidad intelectual leve en las sociedades altamente desarrolladas tecnológicamente; una visión conceptual de las tecnologías de aprendizaje como herramientas de apoyo a la inclusión social; y la importancia de crear entornos de aprendizaje electrónico accesibles para apoyar la educación electrónica inclusiva para las personas con discapacidad intelectual leve. Los autores utilizaron el método analítico y descriptivo sobre la base de las fuentes bibliográficas elegidas para trazar la visión conceptual de las funciones de las tecnologías del aprendizaje en la sociedad en red. El artículo está estructurado de la siguiente manera: introducción; análisis de los antecedentes teóricos de la sociedad en red para comprender los nuevos riesgos de exclusión digital para las personas con discapacidad intelectual leve; la visión general de las tecnologías de aprendizaje para la e-educación inclusiva para las personas en riesgo de exclusión digital, las conclusiones de la investigación y las direcciones para futuras investigaciones.

Palabras clave: tecnologías de aprendizaje; personas con discapacidad intelectual leve; sociedad en red; e-educación inclusiva, exclusión digital

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Tetiana Liakh
Borys Grinchenko Kyiv University, Ukraine
https://orcid.org/0000-0002-8807-0497

Tetiana Spirina
Borys Grinchenko Kyiv University, Ukraine
https://orcid.org/0000-0003-0287-7343

Alina Dulia
Borys Grinchenko Kyiv University, Ukraine
https://orcid.org/0000-0002-9067-4820

Ruslan Horchynskyi
Borys Grinchenko Kyiv University, Ukraine
https://orcid.org/0000-0001-7156-5904

Analysis of the Needs of Social Workers Regarding Their Utilization of ICT in the System of Provision of Social Services (Kyiv City, Ukraine)

Abstract

The use of information and communication technologies (ICT) is an important element in the work of social workers. Recent progress in ICT creates fundamentally new opportunities for social work in the provision of social services, including high-quality and timely responses to the requests of vulnerable population groups and persons in crises. In the information sector, work in the social sphere requires knowledge and skills in effective search, accumulation, processing, storage, presentation, and transmission of data using computers and computer networks. A social worker must be able to use information and computer technologies both for self-development in the professional sphere and for organizing their daily practical activities and solving socially significant problems. Therefore, it is necessary

to form and develop ICT competence in professional activities for the quality provision of social services.
The purpose of the study is to determine the ICT tools used in the practical work of social workers in the provision of social services, the scope of ICT application, and the analysis of the needs of social workers in Kyiv regarding the introduction of ICT into the system of providing social services.

An online survey of social workers of state and non-state organizations in Kyiv, which provide social services to vulnerable population groups and persons in crises, was conducted. The theoretical sampling method was used, which made it possible to formulate generalized recommendations regarding introducing ICT tools into the social services system. To determine the typical ICT tools and directions of ICT used in social work, an expert meeting was held with specialists of the Department of Information and Analytical Work of the Kyiv City Center of Social Services. Resource monitoring was used for the automated search of information on the Internet.

The authors of the article researched the information and communication technologies used by social service providers in their work and highlighted the prospects of ICT tools in state and non-state organizations. The ICT tools that are most often used in the provision of social services have been determined as a result of a survey of social service workers of state and non-state organizations in Kyiv. These tools are grouped into three main categories: communication channels, information dissemination channels, and methods of building online service provision processes. The key needs of social workers regarding the use of ICT tools in the process of providing social services and the most typical challenges in the implementation of these technologies are presented in the article. The authors identified the advantages of using ICT in the provision of social services and proved the effectiveness of the use of electronic services as a quick and effective tool in the process of meeting the requests of vulnerable population groups. The prospects for the use of ICT in the provision of social services are highlighted as well. It has been shown that the use of information and communication technologies in the provision of social services will positively affect the quality of the provision of social assistance and social services. The use of these technologies by social institutions makes it possible not only to effectively respond to the challenges of the military situation in Ukraine but also to promptly respond to the requests and needs of social service recipients and provide them with quality services. The authors presented the main ICTs that can be used by social workers when providing social services.

K e y w o r d s: information and communication technologies, social work, social worker, professional activity, social services, recipients of social services, professional competence

The activity of social workers is aimed at solving social problems of individuals and society, such as social and psychological conflicts, crises and stressful situations; emotional and psychological problems; need and poverty; deviant behavior; delinquent behavior; violence and discrimination; ethnic and national problems; unemployment and professional adaptation; disability and segregation of people with disabilities; lonely elderhood; housing problems Currently, these issues are extended to work with victims of military aggression, forced migrants, war veterans, combatants, and their families, work with individuals and families in difficult life circumstances and crisis.

In Ukraine, since February 24, the circle of potential recipients of social services has significantly expanded, because every citizen of the country can potentially find him/herself in difficult life situations due to active military operations. Thus, the demand for reliable information about basic social services, social guarantees, and services that are available to the recipient at a specific time and in a specific community has increased dramatically. First of all, official sources (information channels of state institutions, community leaders, and state and public organizations that have experience in social work and are well-known in the community) are the translators of updated information and the main communicators for the population in this situation. In Kyiv, the capital of Ukraine, the communicators from the first days of the full-scale invasion of Ukraine were institutions of the social sphere - centers of social services, services for children, social service institutions, and representatives of international public organizations. Moreover, due to their mobility, client orientation, and orientation to the implementation of practical social work, it was the centers of social services that accepted the initial request of citizens for information about a wide range of services including issues of evacuation and delivery of food kits to the restoration of documents and the search for rare medicines; issues of payments to internally displaced persons and psychological support in stressful situations. The growing number of information requests actualized the professional need to ensure prompt response of social workers to existing customer requests, to search for and moderate relevant, reliable, and verified information; to establish high-quality communication between various social services and volunteer organizations that ensure compliance with social guarantees and take care of specific categories of service recipients (Liakh, Spirina, Lekholetova, & Shved, 2021). In this situation, information and communication technologies (ICT) are effective tools for the social worker.

Information and communication technologies are a set of methods, means, and techniques used for the development of information systems and the construction of communication networks, as well as technologies for processing data, information, and messages for the formalization and clarification of tasks in certain subject areas using such systems and networks (Bykov, Spirin & Pinchuk, 2020).

In the conditions of the modern socio-economic and geopolitical problems of Ukraine, the use of information and communication technologies is an integral

element of social worker activity. Therefore, the development of ICT creates fundamentally new opportunities for social workers regarding the quality of providing social services, including a high-quality and timely response to the demands of vulnerable groups of the population and people in a crisis.

The main purpose of ICT in the practice of social work is to provide an immediate and effective response to the demands of social services recipients; ensure high-quality service provision and a wide range of performing tasks; inform people about the services they are entitled to; ensuring the realization of rights and freedoms, and complying with the terms of confidentiality of information.

To achieve this goal in social work, knowledge, and skills of effective search, accumulation, processing, storage, presentation, and transmission of data using computers, electronic and social networks are required. A social worker should be able to use them both for self-development in the professional sphere and for organizing his/her daily practical activities and solving socially significant problems. Therefore, to provide high-quality social services, it is necessary to form and develop IT competence in professional activities.

The author of the research "Information and communication technologies in professional training of social workers" defines the ICT competence of a social worker as "the ability of an individual to use ICT to meet their own needs and solve socially significant, in particular, professional tasks" (Ditkovska, 2013, p.79). The activity of a social worker is diverse and multifaceted. A specialist needs theoretical knowledge and practical skills in using ICT to perform diagnostic and prognostic; human rights protection; organizational, preventive, and communicative functions of professional activity (Denysiuk, Lokhvytska, Martovytska, & Petrochko, 2021). There are two main components in the formation of the ICT competence of a social worker: basic and professional.

The basic ICT component of the social worker's competence is a set of knowledge, skills, and abilities to use general-purpose programs, which is necessary to solve personal and socially significant tasks. The professional component of ICT competence involves mastering special-purpose programs and actively using them to solve professional tasks. The separation of components is conditional, as they are interconnected and interdependent (Ditkovska, 2013).

In the context of our research, the study "Psychological and Pedagogical Conditions for Developing Professional Competency in Future Social Workers Using the Global Network Internet" (Fushtei et al., 2020) is essential for understanding the needs of social workers regarding the use of ICT in the system of providing social services. The study reveals the importance of developing the informational activity of social workers and the use of Internet resources in the formation of their professional and informational competence. The findings of this and subsequent studies (Santos, Barcelos, & Rangel, 2021; Berzin et al., 2015; Goldingay & Boddy, 2017) are valuable and significant as scholars indicate that social workers are increasingly using social media, websites, and online databases,

e-mail, and text messaging services for dealing with social service recipients. Therefore, social workers should be properly prepared to use ICT and it should become an integral part of social work education.

The author of the manual "Globalization and International Social Work" (Payne, 2016) in one of the sections "Technology-based Social Work Education and Practice" describes the influence of future trends in ICT on social work education, as well as on social work practice. In this chapter, the author emphasizes that neither education nor social work practice can be completely empowered by the Internet and other technologies, but these trends will inevitably affect them. The paper examines the main points about how the effects of globalization, which are facilitated by technological development, can contribute to postcolonialism and work against locally contextual social work education and practice.

A group of authors (Ditkovska, 2013; Slechtova, 2015; Lakkala & Ilomäki, 2015; Pavliuk & Liakh, 2019; Buynytska, 2021; Maussumbayev et al., 2022; Liakh, Lekholetova, Petrovych & Spirina, 2022) carried out a thorough analysis of the importance of training future specialists in the social sphere using ICT and formation their ICT-literacy. The researchers have indicated that the labor market needs qualified specialists who possess a system of knowledge with the possibility of application in related fields, can quickly adapt to technological changes, and are ready to improve their education. Thus, to be competitive in the modern labor market, future social workers must be able to use ICT to perform diagnostic, prognostic, human rights, organizational, preventive, and communicative functions of professional activity. The use of ICT in professional activities opens up great opportunities for ensuring constructive social interaction, quick response to the requests of recipients of social services, and quality services.

The study "Utilizing social media for social work: insights from clients in online youth services" (Chan & Ngai, 2019) demonstrated the importance of using ICT in the provision of social services. The study indicated that quality service provision is impossible without combining the technical component with the service need component. personalized news feeds have proved useful in identifying service and news information; online status indicators improve service availability; online communications provide a disinhibition effect; asynchronous communications facilitate continuous feedback loops.

The findings of these studies, current challenges facing social workers in the conditions of military operations in Ukraine, and the emergence of new target groups of recipients of social services require an analysis of the experience of using ICT in the provision of social services by social workers, which formed the basis of our scientific search.

Research question

What are the ICT tools used by specialists in the social sphere of the capital of Ukraine under martial law to achieve the goals of informing, communicating, and providing social services in their daily practical activities?

Hypothesis

The provision of social services and the implementation of social work in Kyiv City under martial law are associated with a sharp increase in requests for information about social guarantees and social services, primarily from those citizens who did not need any social services before the war. It is possible to satisfy this demand in the current conditions without increasing the number of social workers due to the wide use of ICT tools in practical social work, including innovative and popular tools among young people and young families (for example, social networks, messengers, QR codes and others).

Methodology and the Procedure for Assessing the Needs of Social Workers in the City of Kyiv Regarding the ICT Utilization in the System of Provision of Social Services

In the course of the study, an online survey was conducted in June-July 2022 among social workers of state and non-state organizations in Kyiv, which provide social services to vulnerable population groups and persons in a crisis. An online survey is a quantitative method of information collection, the most modern way of obtaining and processing data. Online surveys have become especially relevant during the period of quarantine and under the restrictions related to the pandemic of COVID-19, as well as in the conditions of martial law in Ukraine. This method allows you to quickly and accurately obtain operational information from the target audience. The survey was conducted using the questionnaire method through the online service for collecting information “Google Forms”.

The purpose of the survey was to determine the ICT tools used in the practical work of social workers in the provision of social services, the scope of ICT application, and the analysis of the needs of social workers in Kyiv regarding the implementation of ICT in the social services system.

The questionnaire mainly consisted of closed questions, the topic of which was related to the use of ICT by social workers in the provision of social services, namely: alternative questions (answers “yes” or “no” were expected); a question with a selective answer (three or more answer options were offered to choose from); questions on a Likert scale (questions with an evaluation of the degree of agreement

or disagreement with the essence of each statement); semantic differential (a scale between two bipolar concepts, on which the interviewee chooses the point that most closely corresponds to his/her perception of the phenomenon). The questions of the questionnaire had a logical sequence.

The questionnaire included five blocks of questions:

I. Information about respondents.
II. Identification of the main ICT tools for building interaction with service recipients, informing the community about the services of state or non-state organizations, operational communication with a certain category of service recipients, direct provision of social services, and finding necessary information to provide high-quality services and development of professional competence.
III. Evaluation of the interaction of recipients of social services with electronic services to meet existing requests.
IV. Evaluation of requests from recipients of social services for information about social guarantees, benefits, and social services after the imposition of martial law.
V. Work with the personal data of service recipients.

Participants were invited to participate in the survey through announcements posted on official social networks of state and non-state organizations, personal emails to social workers, and mailings in working groups in messengers.

74 respondents took part in the survey, including volunteers and employees of state and non-state organizations in Kyiv (Table 1).

Table 1
Socio-demographic characteristics of specialists of state and non-state organizations (in %)

	n=74
Age range	20-60 years
Experience (%)	0-1 years – 11 (14.9%)
	1-5 years – 24 (32.4%)
	5-10 years – 7 (9.5%)
	More than 10 years – 32 (43.2%)

Position (%)	Specialist in social work – 34 (45.9%)
	Manager (director, head of the department, deputy director, project coordinator, others) – 9 (12.2%)
	Psychologist – 7 (9.5%)
	Social worker – 7 (9.5%)
	Civil servant – 6 (8.1 %)
	Social manager – 3 (4.1%)
	Methodist of social work – 2 (2.7%)
	Volunteer – 2 (2.7%)
	Leading specialist in social work – 1 (1.4%)
	Involved specialist – 1 (1.4%)
	Personnel inspector – 1 (1.4%)
	Social teacher – 1 (1.4%)
Represented institution (%)	Center of social services – 58 (78.4%)
	Service for children and family – 6 (8.1%)
	International project for the provision of social services/ implementation of social work – 6 (8.1%)
	Public organization – 2 (2.7%)
	Other institutions (Territorial Center, Family Center, Complex Rehabilitation Center, etc.) – 2 (2.7%)
District (territorial affiliation) of the institution	The whole city of Kyiv (City level) – 12 (16.2%)
	Solomianskyi – 20 (27%)
	Dniprovskyi – 14 (18.9%)
	Desnianskyi – 9 (12.2%)
	Podilskyi – 5 (6.8%)
	Darnytskyi – 3 (4.1%)
	Pechersky – 3 (4.1%)
	Holosiivskyi – 3 (4.1%)
	Svyatoshynskyi – 2 (2.7%)
	Shevchenkivskyi – 2 (2.7%)
	Obolonsky – 1 (1.4%)

S o u r c e: own work based on survey results

As a result of the survey, the frequently used ICT tools by specialists in the social sphere have been identified and grouped into three categories: a) communication channels, b) information dissemination channels, and c) methods of building online service provision processes. Also, the main needs and difficulties of using electronic services by recipients of social services have been indicated. After that, the theoretical sampling method was applied, which made it possible to formulate generalized recommendations for the utilization of ICT tools in the system of providing social services. To identify the typical ICT tools and directions for the use of ICT in the practice of social work, an expert meeting was held with specialists at the department of information and analytical work of the Kyiv City Center of Social Services. For the automated search of information on the Internet, resource monitoring was used, which was based on the method of content analysis (content monitoring). Content monitoring was used to study the effectiveness of the provision of social services through electronic documents in Diya (*Diya – State services online*, 2022).

Results of the Assessment of the Needs of Social Workers in the City of Kyiv Regarding Their Implementation of ICT Utilization in the System of Provision of Social Services

The first topic that was covered as a result of the research is the quantitative changes regarding requests for social services and social services, the change in the number of clients, and the response of social sector specialists to these changes. The first question that was answered as a result of the research is the question of quantitative changes regarding requests for social services and social services, changes in the number of clients, and the response of social sector specialists to these changes. As a result of the survey, specialists note an increase in both the request for information about social services and social services (noted by 94.6% of respondents) and an increase in the number of recipients of social services (noted by 90.6%). Detailed information is presented in the diagrams (Figure 1 & Figure 2).

ICT tools have undoubtedly become an effective tool to satisfy primary requests for information about social services and social services and guarantees in the conditions of work during martial law. A significant part of the respondents (37.8%) indicated that the number of working online communications has increased significantly since February 24, 2022 (the beginning of the large-scale invasion of Russian troops into Ukraine). In general, over 50% of respondents reported an increase in communications. Only 12.2% of specialists have not noted the increase in working online communication. In a detailed analysis of the questionnaires

of the group of specialists who did not report an increase in the number of communications, it is possible to follow the trend that the main duties of these specialists are mostly methodical and organizational rather than practical work.

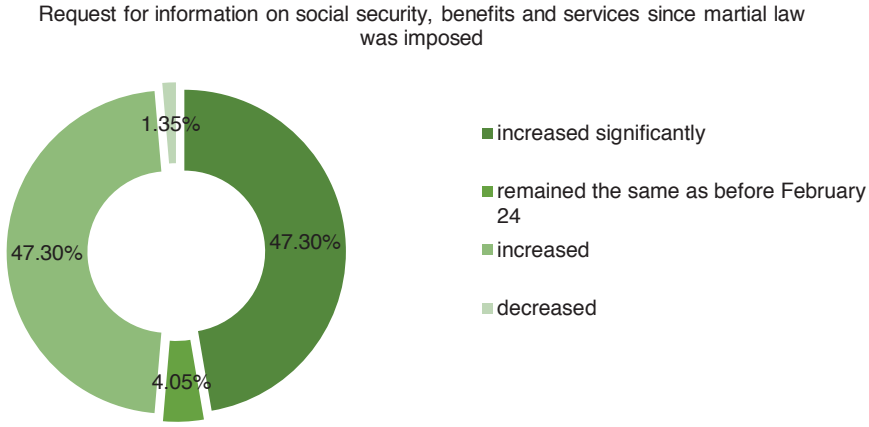

Figure 1. Dynamics of changes in the request for information on social guarantees, benefits, and social services since martial law was imposed

S o u r c e: own work based on survey results

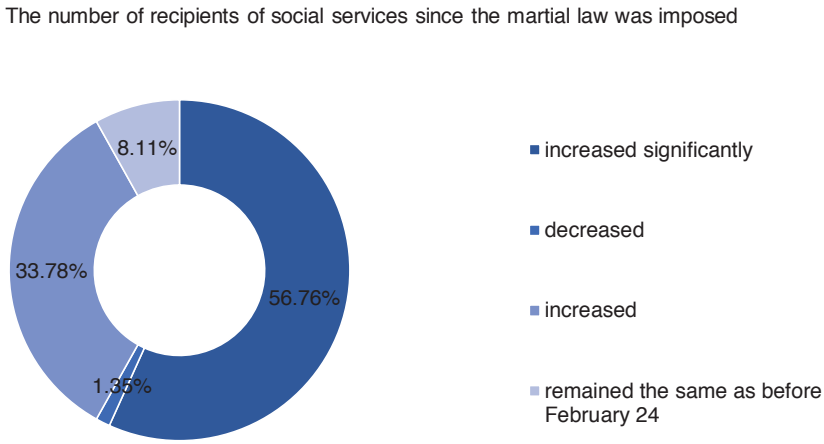

Figure 2. Dynamics of changes in the number of recipients of social services since martial law was imposed

S o u r c e: own work based on survey results

The second and main question of the research was the definition of typical ICT tools used by specialists in the social sphere in their work. It should be mentioned

that all 100% of participants use ICT tools in their practical work, though 83.8% of respondents do it regularly, while 16.2% only sometimes. It was found that the frequency of using ICT tools does not depend on the position or institution the respondent represented, as it is equally distributed among all groups of respondents.

Typical reasons for using ICT tools to achieve work outcomes are:

- development of personal competencies – always or often used by 94.6% of respondents;
- searching for information necessary to provide the service – always or often used by 89.2% of respondents;
- building interaction with service recipients – always or often used by 79.7% of respondents;
- informing the community about the organization's services – always or often used by 78.4% of respondents;
- prompt communication with recipients – always or often used by 77% of respondents;
- direct provision of social services – always or often used by 56.8% of respondents. Typical ICT tools and the frequency of their utilization in the practical work of specialists in the social sphere are presented in the table (Table 2).

Table 2
Use of ICT tools to achieve work goals

Purpose of using ICT/ frequency of use	Always (%)	Often (%)	Sometimes (%)	Never (%)
Building interaction with service recipients	33.8	45.9	18.9	1.4
Informing the community about the organization's services	36.5	41.9	14.9	6.7
Prompt communication with recipients	44.6	32.4	21.6	1.4
Direct provision of social services	23	33.8	36.5	6.7
Searching for information necessary to provide the service	55.4	33.8	10.8	0
Development of personal competencies	59.5	35.1	5.4	0

S o u r c e: own work based on survey results

As shown, ICT tools are most frequently used to develop competencies and to search for necessary information and are less often used in the direct provision

of social services. It can be concluded that according to the data obtained, there is a dependence of the frequency of ICT use on the factor of the need for personal contact, because the technologies for providing many social services require direct contact with the recipient of the service, while such contact is not decisive for finding information or mastering new competencies.

To determine the typical ICT tools, the authors of the survey held an expert meeting with specialists of the Department of Information and Analytical Work of the Kyiv City Center of Social Services. Based on the results of the joint work, a list of 20 ICT tools that are effective in the process of organizing social work, as well as three main directions of using ICT have been defined. The main directions of using ICT are 1) to disseminate information about social services and services, 2) to build communication with recipients of services and services, and 3) to provide direct social services and social work. Also, survey participants justified the frequency of use of all these 20 ICT tools in three areas. The results are presented in the table (Table 3).

Table 3
Frequency of use of ICT tools by the purpose of use

Purpose of use/ ICT tool	Dissemination of information about social services and services		Implementation of working communication with recipients of services		Direct provision of social services and social work	
	Used more often (%)	They are not used more often (%)	Used more often (%)	They are not used more often (%)	Used more often (%)	They are not used more often (%)
Web site	46	54	29.7	70.3	28.4	71.6
Email	47.3	52.7	43.2	56.8	33.8	66.2
Closed group chats on Viber	67.5	32.5	60.8	39.2	50	50
Open communities in Viber	47.3	52.7	48.7	51.3	43.2	56.8
Telegram groups	37.8	62.2	37.9	62.1	35.2	64.8
Channels in Telegram	29.7	70.3	21.6	78.4	24.4	75.6
Personal Youtube channel	8.1	91.9	9.5	90.5	10.9	89.1

Personal page on Facebook	36.5	63.5	29.8	70.2	20.3	79.7
Professional page on Facebook	56.7	43.3	44.6	55.4	32.4	67.6
Facebook Group	51.3	48.7	33.8	66.2	33.8	66.2
Facebook event	41.9	58.1	31.1	68.9	31.1	68.9
Personal profile on Instagram	8.1	91.9	6.8	93.2	6.8	93.2
Corporate Instagram profile	17.6	82.4	16.2	83.8	16.2	83.8
Zoom conferences and calls	60.8	39.2	43.2	56.8	35.2	64.8
Meet conferences and calls	27	73	24.3	75.7	18.9	81.1
Skype conferences and calls	27	73	25.7	74.3	23	77
SMS mailing	31.1	68.9	41.1	59.4	27.1	72.9
Google Forms	44.6	55.4	43.3	56.7	29.8	70.2
Google Docs	44.6	55.4	37.9	62.1	25.7	74.3
QR code	16.2	83.8	17.6	82.4	13.5	86.5

S o u r c e: own work based on survey results

So, summarizing the obtained data, we can define that the most popular ICT tools for social workers in Kyiv in their work in all three areas are the tools of the Viber messenger (used by 67.5% of respondents for information, 60.8% for communication, when providing direct services – 50%, respectively) and professional (specialized) pages on the Facebook social network (used for information by 56.7% of respondents, for communication by 44.6%, and practical service provision by 32.4% of respondents). ZOOM services are also a popular tool for informing about social services (60.8% of respondents prefer to use them), social specialists prefer to use the Google form tool (43.3% of respondents) for communication with service recipients, and Telegram and ZOOM messenger

services are preferred (rather used by 35.2% of respondents) for practical implementation of social work.

The least used in the practical work of specialists are such tools as personal YouTube channels (91.9% of the respondents rather do not use them for information, for communication – 90.5%, and for service provision – 89.1%, respectively), Instagram social network services (rather not used for information by 91.9% of respondents, for communication – 93.2%, and service provision – 93.2%, respectively) and the QR code tool (rather not used for information by 83.8% of respondents, for communication – 82.4%, and service provision – 86.5%, respectively). So, these ICT tools can become a resource for increasing online communications and informing the potential recipient in the future.

It is also worth noting that state-wide and city electronic services, such as the Diya portal (Diya – State services and online, 2022), HELSI medical portal (Medical Information System for Healthcare and the medical portal for patients in Ukraine, 2022), the portals of the Centers for the Provision of Administrative Services (Administrative Services Center of Kyiv city, 2022) and the Kyiv services „Kyiv Digital" (Municipal Main Information and Computing Center, 2022) and „Electronic office of the Kyiv city resident" (The account of Kyiv City resident. Kyiv ID, 2022). At the same time, service recipients often needed help (clarifications, consultations) regarding interaction with the above-mentioned services, as well as assistance in registering on these portals. The frequency of using services and providing consultations by specialists regarding the use of digital services is presented in the table (Table 4).

Table 4
Use of digital services by recipients of social services

Criteria for interaction with services/ Digital service	Use of services by recipients of social services		The need for consultations regarding the use of services		The need for help when registering for the service	
	Rather, they use it (%)	Rather, they do not use it (%)	At least once (%)	No need (%)	Use (%)	No need (%)
Diya portal services	63.5	36.5	75.7	24.3	52.7	47.3
HELSI.me services	66.2	33.8	71.6	28.4	56.8	43.2
The electronic account of the Kyiv City resident. Kyiv ID	31.1	68.9	64.9	35.1	44.6	55.4

Administrative Services Center portal	47.3	52.7	71.6	28.4	56.8	43.2
Kyiv Digital	55.4	44.6	67.6	32.4	48.6	51.4
Other services	31.1	68.9	68.9	31.1	51.4	48.6

S o u r c e: own work based on survey results

Another aspect of the study is data on the use of electronic documents by recipients of social services to build interaction with social professionals. Thus, according to the experience of specialists, service recipients are more likely to use electronic documents in the Diya service (81.1%) than not to use them (18.9%). At the same time, for most specialists, electronic documents are sufficient only for the provision of certain services, and not for the entire range of social services.

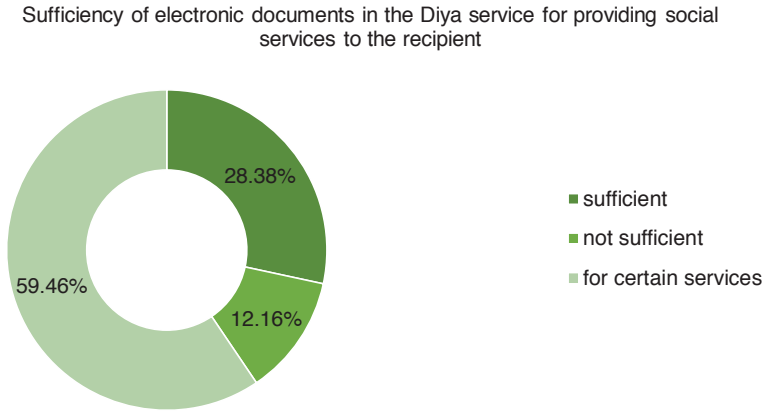

Figure 3. Sufficiency of electronic documents in the Diya service for the provision of social services

S o u r c e: own work based on survey results

The final questions of the survey related to the assessment of the needs of specialists in the social sphere were about mastering ICT technologies. According to the results of the study, it was concluded that 75.7% of the respondents mastered new ICT on their own, while 18.9% of respondents mastered ICT solely due to work needs. Only 5.4% of the specialists do not feel that their ICT competencies are lacking. Among the main gaps are the skills of working with Google electronic documents, the use of TikTok, Instagram, and YouTube services in social work, as well as the lack of knowledge about the features of the organization of online groups of preventive and psychological work.

Conclusions

Increasing requests for information, arranging work in a remote format, and prompt search for data to provide up-to-date and relevant answers are the tasks that social specialists face when working under martial law. Daily response to these challenges also requires the development of personal competencies in the use of ICT tools.

For the effective operation of the entire system of providing social services and providing social guarantees, the general level of mastery of the basic tools and competencies necessary for the provision of high-quality services is very important. The basic level of mastery of ICT tools among social workers in Kyiv proved to be sufficient for prompt response to the sharp increase in requests for social services. Professional competencies helped to relieve social tension and provide the necessary support to service recipients in the first months of work under martial law. It was a thorough preliminary training, including ongoing measures to develop ICT competencies, that made it possible for social workers to function effectively in new circumstances.

However, to improve the general level of competence of specialists, it is important to pay attention to the formation of a general idea of ICT as a full-fledged, rather than auxiliary, working tool, to understand the specific characteristics, and advantages/disadvantages of using ICT tools in the implementation of practical social work, and the development of internal professional standards in terms of the mandatory basic level of using ICT tools as an effective information mechanism for informing potential recipients, building communication and providing social services.

Future research

The contribution of this study was to identify the benefits of using ICT in social service delivery and identify effective ICT tools that social workers could use to deliver quality social services.

We see prospects for future research in the further determination of ICT competencies of social workers in their professional activities and the effectiveness of using electronic services as a tool for obtaining quick and effective results in the process of meeting the needs of various population groups.

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Tetiana Lach, Tetiana Spirina, Alina Dula, Rusłan Gorczyński

Analiza potrzeb pracowników socjalnych w zakresie wykorzystania przez nich technologii informacyjno-komunikacyjnych w systemie świadczenia usług socjalnych (Miasto Kijów, Ukraina)

S t r e s z c z e n i e

Ważnym elementem działalności pracowników socjalnych jest wykorzystanie technologii informacyjno-komunikacyjnych (ICT). Ostatnie zmiany w ICT stwarzają zasadniczo nowe możliwości pracy socjalnej w zakresie świadczenia usług socjalnych, w tym wysokiej jakości i terminowego reagowania na prośby osób w sytuacjach kryzysowych. W sektorze informacyjnym praca w sferze społecznej wymaga wiedzy i umiejętności skutecznego wyszukiwania, gromadzenia, przetwarzania, przechowywania, prezentacji i transmisji danych za pomocą komputerów i sieci komputerowych. Pracownik socjalny musi umieć wykorzystywać technologie informacyjne i komputerowe zarówno do samorozwoju w sferze zawodowej, jak i do organizowania codziennych zajęć praktycznych oraz rozwiązywania istotnych społecznie problemów. Dlatego konieczne jest kształtowanie i rozwijanie kompetencji ICT dla zwiększenia jakości świadczenia usług społecznych.

Celem badania jest określenie narzędzi ICT wykorzystywanych w praktycznej pracy pracowników socjalnych przy świadczeniu usług socjalnych, zakresu zastosowania ICT oraz analiza potrzeb pracowników socjalnych w Kijowie we wprowadzeniu ICT do systemu świadczenia usług socjalnych.

Przeprowadzono internetowe badanie pracowników socjalnych organizacji państwowych i niepaństwowych w Kijowie, które świadczą usługi socjalne dla osób w sytuacjach kryzysowych. Zastosowano metodę doboru teoretycznego, co pozwoliło na sformułowanie uogólnionych rekomendacji wprowadzenia narzędzi teleinformatycznych do systemu świadczenia usług społecznych. W celu określenia typowych narzędzi ICT oraz kierunków wykorzystania ICT w pracy socjalnej odbyło się spotkanie eksperckie ze specjalistami wydziału pracy informacyjno-analitycznej Centrum Opieki

Społecznej w Kijowie. Do automatycznego wyszukiwania informacji w Internecie wykorzystano monitorowanie zasobów.

Autorzy artykułu przyjrzeli się technologiom informacyjno-komunikacyjnym wykorzystywanym przez świadczeniodawców usług społecznych i naświetlili perspektywy ich wdrożenia w pracy organizacji państwowych i niepaństwowych. W wyniku badania pracowników socjalnych organizacji państwowych i niepaństwowych w Kijowie określono narzędzia teleinformatyczne, które są najczęściej wykorzystywane w świadczeniu usług społecznych.

Narzędzia te są podzielone na trzy główne kategorie: kanały komunikacji, kanały rozpowszechniania informacji oraz metody budowania procesów świadczenia usług online. W artykule przedstawiono kluczowe potrzeby pracowników socjalnych dotyczące wykorzystania narzędzi teleinformatycznych w procesie świadczenia usług społecznych oraz najbardziej typowe wyzwania we wdrażaniu tych technologii. Autorzy zidentyfikowali zalety wykorzystania ICT w świadczeniu usług społecznych oraz wykazali skuteczność korzystania z usług elektronicznych jako szybkiego i efektywnego narzędzia w procesie zaspokajania żądań słabszych grup ludności. Zwrócono również uwagę na perspektywy wykorzystania ICT w świadczeniu usług społecznych. Udowodniono, że wykorzystanie technologii informacyjno-komunikacyjnych w świadczeniu usług społecznych wpłynie pozytywnie na jakość świadczenia pomocy społecznej i usług społecznych. Wykorzystanie tych technologii przez instytucje społeczne pozwala nie tylko skutecznie reagować na wyzwania sytuacji militarnej na Ukrainie, ale także szybko reagować na prośby i potrzeby odbiorców usług społecznych i dostarczać im usługi wysokiej jakości. Autorzy przedstawili główne ICT, które mogą być wykorzystywane przez pracowników socjalnych w świadczeniu usług.

S ł o w a k l u c z o w e: technologie informacyjno-komunikacyjne, praca socjalna, pracownik socjalny, aktywność zawodowa, usługi społeczne, odbiorcy usług społecznych, kompetencje zawodowe

Tetiana Liaj, Tetiana Spirina, Alina Dulia, Ruslan Gorchynskyi

Análisis de las Necesidades de los Trabajadores Sociales en cuanto a su Utilización de las TIC en el Sistema de Provisión de Servicios Sociales (Ciudad de Kyiv, Ucrania)

R e s u m e n

Un elemento importante de las actividades de los trabajadores sociales es el uso de las tecnologías de la información y la comunicación (TIC). Los desarrollos recientes en las TIC crean oportunidades fundamentalmente nuevas para el trabajo social en la provisión de servicios sociales, incluidas respuestas oportunas y de alta calidad a las solicitudes de grupos de población vulnerables y personas en situaciones de crisis. En el sector de la información, el trabajo en la esfera social requiere conocimientos y habilidades en la búsqueda, acumulación, procesamiento, almacenamiento, presentación y transmisión de datos efectivos utilizando computadoras y redes informáticas. Un trabajador social debe ser capaz de utilizar las tecnologías de la información y la informática tanto para el desarrollo personal en el ámbito profesional como para organizar sus actividades prácticas diarias y resolver problemas socialmente significativos. Por lo tanto, es necesario formar y desarrollar la competencia TIC en las actividades profesionales para la prestación de servicios sociales de calidad.

Los autores del artículo investigaron las tecnologías de la información y la comunicación utilizadas por los proveedores de servicios sociales en su trabajo y destacaron las perspectivas de las herramientas TIC en las organizaciones estatales y no estatales. Los autores encuestaron a trabajadores

sociales de organizaciones estatales y no estatales en la ciudad de Kyiv sobre las herramientas TIC más utilizadas y frecuentes en la prestación de servicios sociales. Estas herramientas se agrupan en tres categorías principales: canales de comunicación, canales de difusión de información y métodos para construir procesos de provisión de servicios en línea. Las necesidades clave de los trabajadores sociales con respecto al uso de herramientas TIC en el proceso de prestación de servicios sociales y los desafíos más típicos en la implementación de estas tecnologías se presentan en el artículo. Los autores identificaron las ventajas del uso de las TIC en la provisión de servicios sociales y comprobaron la efectividad del uso de los servicios electrónicos como una herramienta rápida y eficaz en el proceso de atención de las demandas de los grupos poblacionales vulnerables. También se destacan las perspectivas del uso de las TIC en la prestación de servicios sociales. Se ha comprobado que el uso de las tecnologías de la información y la comunicación en la provisión de los servicios sociales afectará positivamente la calidad de la prestación de la asistencia social y los servicios sociales. El uso de estas tecnologías por parte de las instituciones sociales hace posible no solo responder de manera efectiva a los desafíos de la situación militar en Ucrania, sino también responder rápidamente a las solicitudes y necesidades de los destinatarios de los servicios sociales y proporcionarles servicios de calidad. Los autores presentaron las principales TIC que pueden ser utilizadas por los trabajadores sociales en la provisión de servicios sociales.

P a l a b r a s c l a v e: tecnologías de la información y la comunicación, trabajo social, trabajador social, actividad profesional, servicios sociales, destinatarios de servicios sociales, competencia profesional

Татьяна Лях, Татьяна Спирина, Алина Дуля, Руслан Горчинский

Анализ потребностей социальных работников в использовании ими ИКТ в системе оказания социальных услуг (г. Киев, Украина)

А н о т а ц и я

Важным элементом деятельности социальных работников является использование информационно-коммуникационных технологий (ИКТ). Последние разработки в сфере ИКТ создают принципиально новые возможности для социальной работы при оказании социальных услуг, в том числе для качественного и своевременного реагирования на запросы уязвимых групп населения и лиц, находящихся в кризисных ситуациях. В информационном секторе работа в социальной сфере требует знаний и навыков эффективного поиска, накопления, обработки, хранения, представления и передачи данных с использованием компьютеров и компьютерных сетей. Социальный работник должен уметь использовать информационные и компьютерные технологии как для саморазвития в профессиональной сфере, так и для организации своей повседневной практической деятельности и решения общественно значимых задач. Поэтому необходимо формировать и развивать ИКТ-компетентность в профессиональной деятельности для качественного оказания социальных услуг.

Целью исследования является определение средств ИКТ, которые используются в практической работе социальных работников при предоставлении социальных услуг, области применения ИКТ и анализ потребностей социальных работников г. Киева по внедрению ИКТ в систему предоставления социальных услуг.

Был проведен онлайн-опрос социальных работников государственных и негосударственных организаций г. Киева, которые предоставляют социальные услуги уязвимым группам населения и лицам, оказавшимся в кризисной ситуации. Был применен метод теоретическая выборка позволивший сформулировать обобщенные рекомендации по внедрению инструментов ИКТ в систему предоставления социальных услуг. С целью определения типовых инструментов ИКТ и направлений использования ИКТ в практике социальной работы была проведена экспертная встреча со специалистами отдела информационно-аналитической работы Киевского городского центра социальных служб. Для автоматизированного поиска информации в Интернете применялся мониторинг ресурсов.

Авторами статьи исследованы информационно-коммуникативные технологии, которые используют социальные работники в професиональной деятельности и освещены перспективы их внедрения в работу государственных и негосударственных организаций. В результате опроса социальных работников государственных и негосударственных организаций города Киева было определено средства ИКТ, наиболее часто используемые при предоставлении социальных услуг. Эти инструменты сгруппированы в три основные категории: каналы связи, каналы распространения информации и методы построения процессов предоставления онлайн-услуг. В статье представлены ключевые потребности социальных работников относительно использования средств ИКТ в процессе предоставления социальных услуг и наиболее типичные проблемы при внедрении этих технологий. Авторы выявили преимущества использования ИКТ при оказании социальных услуг и доказали эффективность использования электронных услуг как быстрого и действенного инструмента в процессе удовлетворения запросов уязвимых групп населения. Также выделены перспективы использования ИКТ в предоставлении социальных услуг. Доказано, что использование информационно-коммуникационных технологий социальными работниками положительно повлияет на качество предоставления социальной помощи и социальных услуг. Использование данных технологий социальными организациями позволяет не только эффективно реагировать на вызовы военной обстановки в Украине, но и оперативно реагировать на запросы и потребности получателей социальных услуг и оказывать им качественные услуги. Авторы представили основные ИКТ, которые могут быть использованы социальными работниками при оказании социальных услуг.

К л ю ч е в ы е с л о в а: информационно-коммуникационные технологии, социальная работа, социальный работник, профессиональная деятельность, социальная услуга, получатели социальных услуг, профессиональная компетентность

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Katarzyna Tomaszek
University of Rzeszów, Poland
http://orcid.org/0000-0001-7019-5403

Agnieszka Muchacka-Cymerman
Pedagogical University of Cracow, Poland
https://orcid.org/0000-0002-1627-4036

Students' Burnout in the E-School Environment: Pilot Study Results of the Validation of the E-learning Burnout Scale

Abstract

The COVID-19 pandemic caused widespread school closures and therefore forced students to study outside of the classroom at home via the Internet. However, for some students remote education was found to be challenging and stressful (Bilal et al., 2022). Past research revealed that despite the advantages of online classes, there are several threats e .g. lower academic performance, lower engagement and work avoidance goals, higher depression and anxiety (Daumiller et al., 2021; Srivastava et al., 2021), and school burnout (Salmela-Aro et al., 2022). Because previous studies regarding the student burnout syndrome have used predominantly traditional school in-personal learning, there is a great need for developing an instrument with the potential to measure online student burnout symptoms. The aim of this research was to investigate the appropriateness of using an E-learning burnout scale with an adolescent population. The E-Learning Burnout Scale (E-SBS) was designed specifically for measuring exhaustion and learning difficulties caused by school closures during the COVID-19 pandemic. E-learning burnout syndrome, which is defined as the five-dimensional construct, captures thoughts, feelings, and behaviours related to educational difficulties experienced by adolescent students during online classes. The results confirmed the E-SBS to

be psychometrically sound regarding the five-factor structure, content validity, and discriminative validity. Hence, the E-SBS scale has shown potential for use in a variety of educational areas.

K e y w o r d s: e-learning burnout syndrome, adolescents, education, psychometric validation

The COVID-19 pandemic caused widespread school closures and therefore forced students to study outside of the classroom at home via the Internet. However, for some students remote education was found to be challenging and stressful (Bilal et al., 2022). Past research revealed that despite the advantages of online classes, there are several threats e .g. lower academic performance, lower engagement and work avoidance goals, higher depression and anxiety (Daumiller et al., 2021; Srivastava et al., 2021), and increase in school burnout level (Salmela-Aro et al., 2022). Because previous studies regarding the student burnout syndrome have used predominantly traditional school in-personal learning, there is a great need for developing an instrument with the potential to measure online student burnout symptoms. The E-Learning Burnout Scale (E-SBS) was designed specifically for measuring exhaustion and learning difficulties caused by school closures during the COVID-19 pandemic. The theoretical background and validation of this instrument is discussed in this paper.

What is more, many past studies have confirmed the significant associations between higher student burnout syndrome and lower psychological well-being (Bhugra & Molodynski, 2022), however to our knowledge, none of them examined the above-mentioned relationship in the distance learning context among Polish adolescents.

Research Background

During the COVID-19 pandemic, both teachers and students faced many difficulties related to external resources (e.g. internet connection, access to devices) and internal resources (e.g. anxiety, phobia). As the pandemic grew, the Ministry of Education and Science in Poland decided to close all schools and thus embark on remote learning, for which neither teachers nor students and, just as often, the system itself, were prepared. According to Winiarczyk and Warzocha (2021), remote teaching formulated a quite different educational reality. The tasks facing teachers were no longer just educational, but often IT-related and psychological. Getting students interested in learning also plays a very important role, which is made possible by teaching materials available on educational platforms. For many teachers, especially at the beginning of remote work, it was a challenge to find materials interesting enough for the group. Nearly half of the teachers felt

insufficiently prepared for online learning (Ptaszek et al., 2020). In addition, almost 80% of teachers have not participated in training on remote work (Winiarczyk, Warzocha, 2021). According to a report by Plebanska et al. (2020), teachers were insufficiently prepared for remote teaching.

Also for the students, working remotely was difficult. They were left at home overnight with no information on how long they would function in this way. The theory of wearing different masks depending on the environment in which the individual finds him-/herself is well-known (Tylikowska, 2000, 2016). Students who created themselves at school different to how they are at home were forced to create a new version of themselves, one that from behind the door of the room would not be too difficult for the parent to accept. Often, then, relationships that had been enduring were broken, and it was hard to 'like' someone completely different. The consequences were myriad, from anxiety (Munir et al., 2021) through depression (Al Azzam et al., 2021) to thoughts or suicide attempts (Rahman et al., 2021). A very important barrier – highlighted by both groups – was limitations in accessibility to the teacher/face-to-face contact (Azlan et al., 2020). Both teachers and students find it easier to pay attention to something they do not understand in class time.

Students' burnout with the distance learning concept

Burnout syndrome is affecting a growing group and is becoming a serious social problem that can affect both teachers and students. A significant group exhibits some symptoms of burnout, but underestimates them. Negative attitudes and behaviours related to the educational process can be seen in students as a result of their burnout, such as unwillingness to go to school every day, avoiding contact with classmates, escaping to the computer, lack of involvement in the educational process, lack of interest in the issues presented in class, lack of an intrinsic motivation to learn, or loss of bonds with classmates, among others (Muchacka-Cymerman & Tomaszek, 2017). Wilsz (2009) sees the causes of school burnout in students as the occurrence of negative attitudes and behaviour related to the educational process consisting of, among other things, reluctance to go to school every day, lack of commitment to the educational process, avoidance of contact with classmates, lack of faith in receiving good grades and appreciation from the teacher and other students, lack of intrinsic motivation to learn consisting of fear of school, loss of bonds with classmates, and frustration over lack of success. The author states that student burnout in the educational process is mainly due to students' failure to cope with stress, inadequate adaptation of the learning process to individual students' personality traits, a poor school atmosphere, too much information provided to students in the educational process due to overloaded curricula, and a high pace of delivery (Wilsz, 2009). Maslach et al. (1997), on the other hand, points out that burnout among students refers to a sense of exhaustion from the demands of learning, a cynical attitude towards learning,

and a sense of incompetence in the role of a student. These three variables form the 3-dimensional burnout theory, and research by Schaufeli et al. (2002) support the three-component nature of this phenomenon. Burnout is defined by Schaufeli et al. (2002) as a chronic and negative mental state resulting from performance. Initially, the individual has a sense of exhaustion, while the next stage is discouragement from performing tasks, reduced effectiveness of activities, decreased motivation and negative attitudes and behaviours that hinder adaptation at work.

Santinello's (2008) Burnout Theory refers to four aspects of burnout: psycho-physical exhaustion, lack of engagement with the audience, lack of self-efficacy, and disillusionment with one's professional trajectory. The psychophysical exhaustion sphere can refer to high levels of stress or exhaustion. Lack of commitment to the relationship with others largely refers to the individual's social environment, along with his/her relationship with that environment (e.g. student-student, student-teacher). The sense of efficacy is related to how the individual assesses his/her competence in relation to the area of his/her actions. The last aspect touches on the sphere of the individual's existence, his/her satisfaction with the action he/she takes, or his/her motivation to work.

According to Aypay's (2012) theory, school burnout is a consequence of burnout that has occurred as a result of excessive demands placed on the individual from school. In his theory, Aypay believes that burnout consists of seven-factors: loss of interest in school, burnout from family, burnout from learning, burnout from homework, burnout from teacher demands, the student's need for rest and time to play, and a sense of inadequacy at school. According to the research, gender also plays a significant role in the occurrence of school burnout syndrome. School burnout in the adolescent population is generally higher among boys (Zinali, 2013). In contrast, girls are more likely to be burned out in late adolescence (Imani et al., 2018). Research by Herrmann et al. (2019) explains that girls' higher exhaustion scores may be explained through aspects of self-esteem and motivation. In addition, adolescents who experience burnout may also be susceptible to the occurrence of Internet addiction (Tomaszek & Muchacka-Cymerman, 2020) and depression (Malooly et al., 2017). Researchers have also noted that burnout increases as students' age increases and may correspond to the level of stress experienced as adolescents change their level of education (Lee et al., 2013).

The COVID-19 pandemic forced students and teachers to widely use the new technologies in education, which created new study conditions, accompanied by lack of direct contact and support from teachers, social isolation from classmates, and challenges in learning as students had to become more involved in the individual study, while parents were forced to assume the role of the tutor or, in some cases, teacher. In such stressful conditions students experienced increase in distress and mental health problems, e.g. depression and anxiety, as well as difficulties in meeting educational demands. Hence, the depletion of personal resources and high study demands might have caused a higher risk of burnout

symptoms development, directly related to learning at home via the Internet. To date, researchers have focused on measuring burnout level with traditional scales created for the in-personal school environment, also during the COVID-19 pandemic. However, in the light of school closures, pupils faced new challenges related to distance learning. As such, there was a great need for developing new measurement of burnout symptoms experienced by youths because of education via virtual technologies. The afore-mentioned five dimensional construct of e-learning burnout was developed based on classical Maslach 3-dimensional burnout theory, Santinello 4-dimensional approach, as well as Aypay's dimensional student burnout theory.

E-learning burnout syndrome is defined as a students' response, extended in time, to chronic online learning stressors in the e-school environment. It comprises five key sub-dimensions:

- feeling exhausted with distance learning that comprises the physical and mental feeling of being overwhelmed caused by the increased workload, with poor instructional support from teachers and physical strains such as long hours in front of the computer;
- burnout due to parental pressure that refers to an increase in parents' supervision, doubts about children's e-study efforts, and demands related to academic achievements;
- loss of educational interest, motivation and aspirations, which contains student's loss of interest in acquiring knowledge, loss of study engagement and effort, lowering of expectations regarding school performance, and resignation from full participation in the e-classes by engaging in social mediaor online games;
- negative attitude towards school measures, the change in attitude towards school into a more negative and cynical one;
- study disappointment, which captures students' boredom and displeasure caused by frustration and difficulties in understanding the teachers' instructions and the presented learning materials.

Research Focus

The E-learning Burnout Scale (E-SBS) is an experimental version of the tool, developed to measure a new educational phenomenon, namely student learning loss due to school closures caused by the COVID-19 pandemic. Thus the main goals of our study were two-fold aimed to test the psychometric properties of the E-SBS scale in the Polish education context, and to establish the factor structure of the adolescents' e-learning burnout syndrome, and to examine its, internal consistency, and construct validity. Additionally, we also analyzed the distribution of e-learning burnout scores in the studied adolescent population by sex and age.

Given the limitations of currently available instruments to test e-learning burnout, the main study question was What are the psychometric properties of a novel E-SBS scale? Particularly we were looking for the answer to the following

questions: (1) What is the factor structure of e-learning burnout phenomenon? (2) What is the internal reliability of the E-SBS scale? (3) Does a 22-item E-SBS scale meet the convergent validity criterion? (4) Do girls and boys score differently in E-SBS scale? (5) Do E-SBS scores are different among early, middle and late adolescent groups? Our main hypotheses were as follows:

H1: E-learning burnout syndrome is a multidimensional phenomenon. The multidimensional structure is postulated in past theoretical approaches suggest 3 up to 5 components of burnout syndrome e.g. Maslach's or Aypay's theory.

H2: The five components of e-learning burnout syndrome measured by E-SBS scale will be interrelated to one another. According to main past burnout theories, the symptoms of burnout are connected to each other, and one symptom may be the cause of the full syndrome development (Tucholska, 2009; Salmela-Aro et al., 2009). Madigan and Curran (2021) in their meta-analysis found that while is the core academic burnout symptom is exhaustion, while cynicism and inadequacy are recognized as the consequent behavioral and emotional expressions of exhaustion.

H3: The E-learning burnout symptoms will be significantly related to burnout symptoms observed by parents (convergent validity measurement). Burnout literature define study-related syndrome as a maladaptive emotional, cognitive, behavioral and physiological response to long-term exposure to stressful events (Tomaszek & Muchacka-Cymerman, 2020). The most observable burnout symptom is behaviors and reactions indicating depressive moods and lack of energy (Tucholska, 2009).

H4: Girls will score higher in E-SBS than boys. Past studies have confirmed sex differences in burnout experience, with girls to be more prone for developing this syndrome (Tomaszek, Muckacka-Cymerman, 2019). A more recent study revealed that female students score higher in exhaustion, cognitive impairment, and emotional impairment (Fiorilli et al., 2022).

H5: There will be differences in E-SBS scores among early, middle and late adolescents. The burnout level and changes in its dynamics are related to the progression of students to the next educational stages. Past longitudinal and cross-sectional studies have shown that school burnout increases with age (Farina et al., 2020).

The second aim of the current study was to examine the associations between students' e-learning burnout syndrome and their psychological well-being during the pandemic Covid-19. Educational burnout is recognized as one of the most significant factors predicting loss in psychological well-being (Hwang, Kim, 2022). A decrease in psychological well-being is related to students' inability to align study and environmental demands (Anriyani et al., 2017). Therefore, it affects both the life and educational satisfaction of students, as well as the ability to play an active role in school and cope with everyday stressors. Because the pandemic Covid-19 was recognized as a serious source of life threat and educational stressor, "this new social reality has introduced new stressors such as the irrational fear

of contagion, social distancing that leads to isolation and distrust, together with the loss of positive attitudes such as security, predisposition, or effort" (Ruiz--Robledillo et al., 2022, p.3). As regards these findings, we assume that *higher e-learning burnout will be associated with lower psychological well-being* (H6).

Methodology of Research

Composition of the E-SBS scale

The E-SBS Scale focuses on five factors regarding the e-learning difficulties experienced by students. Thus, it assesses the thoughts, feelings and behaviours of students during their online classes which prevent them from participating effectively in the e-lessons. The first step of preparing the research tool was developing 22 questionnaire items and dividing them into five sub-scales according to the categories corresponding to Student Burnout with E-Learning concept. Next, two independent judges (doctors of psychology with experience in working with adolescents) assessed the degree of comprehensibility and relevance of the items. In line with their comments, some items were changed or reversed. This experimental version of the scale was used in the pilot study.

Sample and Procedure

The study was conducted online between 16 April and 30 May 2021, using the Google Forms application. Prior to starting the survey procedure, the consent to participate in the study was obtained from primary and high schools (12 schools located in different parts of Poland), parents and students. The information about the survey with the link to the online forms were sent via school e-mails to adolescents, and their parents. The sample consisted of 186 students from grades 7–8 of primary school and grades 1–3 of high school (112 girls (60%), 74 boys (40%); 11–19 years of age with Mage = 15. 93 years; SD = 1.70). The parent sample was composed of 29 participants (Mage = 44.31; SD = 6.85), mostly mothers (14% fathers).

Ethical Consideration

The study was conducted in accordance with the Helsinki Declaration for research on people, and was approved by the Ethical Committee of the Institute of Psychology in the Pedagogical University of Cracow.

Instruments

The E-learning Student Burnout Scale (E-SBS)

The scale was developed by Tomaszek and Muchacka-Cymerman based on past theoretical and empirical approaches to student burnout syndrome (Maslach, Aypay) and the recent studies on distance learning specificity and challenges (Basar et al., 2021; Özüdoğru, 2021, Macałka i in., 2022). The final list of items within the E-SBS was devised after being revised by two experts within educational settings (doctors of psychology).The E-SBS scale is a self-report 22 items scale to measure the adolescent students' burnout with online learning total score and its five sub-dimensions. The students answer on a 5-point Likert scale (1–I completely agree, 5–I completely disagree). The questions contains five areas of difficulties:(1) Feeling exhausted with distance learning (e.g. My study duties overwhelm me when I sit at the computer during classes), (2) e-burnout due to parental pressure (e.g. Since I am studying via the Internet, my parents keep reminding me to learn), (3) Loss of educational interest, motivation and aspirations (e.g. Due to the fact that I am studying via the Internet, I am not motivated to learn), (4) Negative attitude towards school–a reversed scale (e.g. Since I am studying via the Internet, I have a more positive attitude towards the classes), (5) Study disappointment (e.g. During my online classes, I feel disappointed more often with the knowledge that the teacher provides).

Measures used for validation

The E-SBS scores were correlated with indicators of adolescent psychological well-being (self-report subjective opinion of students) and with the SBO scale that captures the student burnout symptoms perceived by parents and teachers. The following measures from the Pilot Study were used to assess the criterion accuracy of E-SBS:

The observation scale of student burnout symptoms for parents and teachers (SBO) developed by Tomaszek and Muchacka-Cymerman is a brief measurement for assessing the presence (or absence) of eleven student burnout symptoms. The list of questions was obtained on the basis of Maslach and Salmela-Aro burnout syndrome definition and discussed with two experts in the field (doctors of psychology). The scale contains items that captures the symptoms like the lack of enthusiasm and energy to learn, irritability and nervousness appearing during conversations about school duties, anxiety related to school tasks, negative beliefs about own school skills, the belief about 'being' a worse student than others, the lack of engagement in school duties (negligent performance of tasks, study weariness and anhedony, etc.). The respondents also had the option to add a symptom that was not listed. The person completed the scale by selecting one from two options Yes/No. The scale allows to measure the overall level of observed parent or teacher student burnout symptoms.

Psychological Well-Being Scale Caroll Ryff (PBW), adapted by Karaś & Cieciuch (2017) to the Polish context, is an 18-item instrument used for measuring subjective psychological well-being. It taps six areas of well-being and happiness such as autonomy (AT) ("e.g. I have confidence in my opinions, even if they are contrary to the general consensus", environmental mastery (EM) (e.g., "In general, I feel I am in charge of the situation in which I live"), personal growth (PG), (e.g., "I think it is important to have new experiences that challenge how you think about yourself and the world"), positive relations with others (PR) (e.g., "People would describe me as a giving person, willing to share my time with others"), purpose in life (PL) (e.g., "Some people wander aimlessly through life, but I am not one of them"), and self-acceptance (SA) (e.g., "When I look at the story of my life, I am pleased with how things have turned out"). The respondents are asked to rate each of the statements on a 5-point Likert scale (1–strongly agree; 5–strongly disagree) (e.g. Maintaining close relationships has been difficult and frustrating for me). In this study, Cronbach's αfor total score reached .81, for sub-dimensions .58(AM), .51 (EM), .49 (PG),.59(PR), .42(PL), and .73 (SA).

Data Analysis

Descriptive statistics, namely the mean (M), standard deviation (SD), kurthosis, skeness, and Shapiro-Wilk normality test for E-SBS scale data items, and comparison analysis e.g. U Mann-Whitney test and Kruskal-Wallis test, as well as Tuckey post hoc tests for examining gender and age differences were calculated. The Pearson's correlation analysis were performed to test the inter-correlation between five sub-factors of E-SBS scale, and to examine the associations between E-SBS and PBW scores. The structure of the e-learning burnout was explored by using exploratory factor analysis (EFA) on E-SBS items. The above-mentioned statistics were performed using IBM SPSS Statistics 22.0. Reliability analysis (Cronbach's α and McDonald's ω coefficients) and model fit indexes in EFA and confirmatory factor analyses (CFA) statistics were calculated with Jamovi free software. Prior to performing EFA and CFA statistics, data were verified in terms of removing all missing data. The bivariate Pearson Correlation was performed on continues variables e.g. E-SBS and PBW results from the total sample (N = 187). The sample size over 100 causes that although both variables did not meet the normal distribution criterion the bias is small and does not affect obtained results (Beversdorf, 2008). The Spearman correlation analysis was performed on the data from 29 parent-adolescent dyads. The non-parametric analysis was chosen because of the non-normal distribution of E-SBS scale data.

Results of Research

Descriptive statistics

The assumed structure of the e-learning burnout syndrome was examined by EFA statistics, with the measures of the obtained correlation matrix (the Kaiser-Meyer-Olkin, KMO), and the Bartlett's sphericity test. The items' distribution significantly differed from the normal distribution (Shapiro-Wilk normality test results equal to $p < 0.001$). However, the values of skewness and kurtosis themselves ranged between –1.35 to 1.26, and did not exceed the range from –2 to +2, which suggests that the deviation was not significant. Therefore, the principal axis method for EFA statistic – which does not require a normal distribution of the analysed items – was chosen. Most of the extraction communalities determining the variance of the given variables obtained values greater than the acceptable 0.3 (only two items were lower than the criterion e.g. items 11 and 22). The result indicates the possibility of assigning almost all of the items to the structure of the tool (see Tab. 1).

Table 1
Descriptive statistics of E-SBS items, the results of the Shapiro–Wilk normality test, and the extraction communalities

Item	M	SD	Skewness	Kurtosis	Shapiro-Wilk normality test	Extraction communalities
ESWS1	3.29	1.20	–.26	–.66	.91***	.51
ESWS2	2.05	1.16	.85	–.32	.82***	.49
ESWS3	3.50	1.32	–.45	–.99	.87***	.72
ESWS4	3.47	1.23	–.35	–.88	.89***	.48
ESWS5	3.73	1.37	–.78	–.68	.82***	.62
ESWS6	3.04	1.45	–.00	–1.35	.88***	.54
ESWS7	3.18	1.40	–.20	–1.22	.89***	.40
ESWS8	3.47	1.33	–.46	–.89	.88***	.78
ESWS9	2.56	1.13	.28	–.74	.90***	.44
ESWS10	2.82	1.35	.20	–1.13	.90***	.35
ESWS11	2.36	1.19	.68	–.38	.87***	.18
ESWS12	1.87	1.16	1.26	.68	.75***	.62
ESWS13	3.50	1.35	–.58	–.84	.86***	.65

ESWS14	3.39	1.31	–.37	–.95	.89***	.45
ESWS15	3.42	1.29	–.32	–1.00	.89***	.64
ESWS16	2.61	1.38	.34	–1.14	.88***	.37
ESWS17	2.42	1.08	.33	–.59	.89***	.55
ESWS18	2.93	1.22	.06	–.84	.91***	.40
ESWS19	2.22	1.24	.66	–.72	.84***	.90
ESWS20	2.72	1.28	.34	–.95	.90***	.37
ESWS21	3.49	1.34	–.46	–1.04	.87***	.58
ESWS22	3.24	1.33	–24	–1.07	.90***	.26

Note: *** $p < 0.001$

Sources: Own work

The structure of E-learning Student Burnout Syndrome – EFA results

The KMO test was equal to .86, which indicates that the composition was satisfied (KMO value > 0.50) (Kaiser, 1974). The Bartlett's sphericity test ($\chi^2_{(231)} = 1815.47$; $p < .0001$) suggests significant correlation coefficients and the presence of acceptable shared variance (Reddy et al., 2019). An EFA was calculated using the principal axis method with Oblimin rotation and the critical factor load value < 0.4. The graphic presentation of the EFA results is shown in Fig. 1. The findings suggest that the first five factors account for most of the total variability in data (given by the eigenvalues > 1).

Five factors distinguished on the basis of scree plot explained 61.8% of the variance. All of them assumed the acceptable sum of the squared loadings greater than 1 (see Tab. 2).

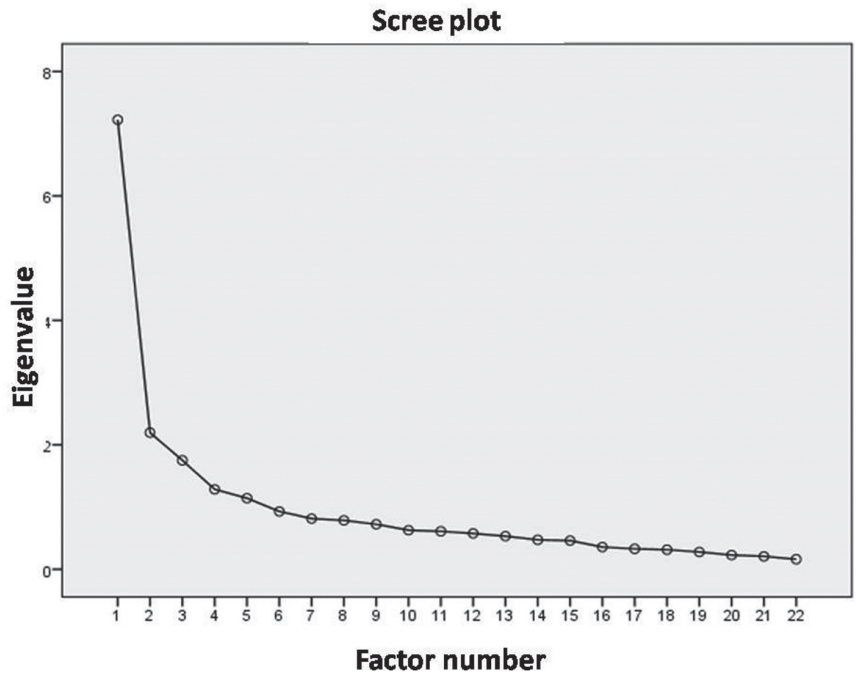

Figure 1. Scree plot of EFA results

Table 2

Total variance explained values

Factor number	Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1	7.22	32.84	32.84
2	2.12	9.98	42.82
3	1.75	7.96	50.77
4	1.28	5.84	56.61
5	1.14	5.19	61.80

S o u r c es: Own work

The five factors solution included statements with the factor loadings > 0.4. The first factor e.g. Loss of educational interest, motivation and aspirations consisted of 8 items with loadings ranging from .51 to .83, and other 3 statements assigned to the second factor (E-burnout due to parental pressure) had loadings ranging from .70 to .90. The structure of the third factor (Negative attitude towards school)

contained 4 items with the values of factor loadings from .46 to 0.79. The next factor (Study disappointment) consisted of 3 statements with loadings ranging from .69 to .75, and the fifth and final factor (Study exhaustion) had 4 items with loadings ranging from .63 to .82. Most of items loaded with high value single factor, simultaneous loadings were much lower – equal to 0.4 and lower. Only two statements simultaneously loaded other factors e.g. item 3 loaded the third (.59), fourth (.49) and fifth (.69) factor; and item 21 loaded the third (.49), fourth (.50) and fifth (.63) factor (see Tab. 3).

Table 3
EFA with Oblimin rotation (N=186)

Number of item	Component number				
	1	2	3	4	5
Factor 1. Loss of educational interest, motivation and aspirations					
8	**.83**				
13	**.73**				
20	**.66**				
14	**.66**				
6	**.63**				
5	**.60**				
11*	**–.52**				
10	**.51**				
Factor 2. E-burnout due to parents' pressure					
19		**.90**			
12		**.85**			
16		**.70**			
Factor 3.Negative attitude towards schoola					
17*			**.79**		
2*			**.75**		
9*			**.73**		
22*			**.46**		
Factor 4. Study disappointment					
15				**.75**	

18				**.75**	
4				**.69**	
Factor 5. Study exhaustion					
1					**.82**
7					**.75**
3					**.69**
21					**.63**
Total variance: 61.8%	16.8%	12.3%	12.2%	10.6%	10%
Model fit measures: RMSEA = .059, 90CI[.04,.07]. TLI = .90, BIC = -469, χ^2 = 215, df = 131, p < .001					

N o t e : a-reversed scale, *-reversed items

S o u r c es: Own work

Statistically significant values of Pearson's inter-correlation coefficients were revealed between all selected factors (except factors 2 and 3) and E-SBS total score (see Tab. 4).

Table 4
Component intercorrelation matrix

Factor number	1	2	3	4	5	E-SBS
Factor 1	–					
Factor 2	.26***					
Factor 3	.37***	.07	–			
Factor 4	.61***	.24**	.29***			
Factor 5	.59***	.27***	.46***	.56***	–	
E-SBS	.89***	.46***	.58***	.75***	.81***	–

N o t e : *** p < .0001; ** p < .001

S o u r c es: Own work

Validation of the internal structure of the E-SBS scale – confirmatory factor analysis with maximum likelihood method (CFA)

Two structures of e-learning burnout syndrome were examined: model 1: one factor solution and model 2: five factor solution. The statistically significant values of the quoted criterion of goodness – chi square – were obtained in both

solutions, suggesting that the restrictions imposed in the theoretical model are correct. However, such results are a frequent phenomenon with a large sample size, as χ^2 test is sensitive to the size of the sample. Moreover, the relative/normed chi-square value (χ^2/df) took an acceptable value < 5.0. (in model 1: 3.95 and model 2: 2.13) (Januszewski, 2011). Most of the other fit indices were acceptable or slightly below the criterion only in model 2. The value of Steiger-Lind's RMSEA average square approximation was below the acceptable value .08 only in model 2 (RMSEA =.078), and the comparative fit index (CFI = .87) was about equal to the permissible value of .90 (Sun, 2005; Januszewski, 2011; Netemeyer et al., 2012). In summary, the CFA results confirmed that the model is in line with reality, and quite well suited to the data, as fit indicators were mostly at an acceptable level. The obtained values could be mainly influenced by the large sample size (see Tab. 5).

Table 5
Model fit indices

Model number	χ^2, p	CFI	TLI	RMSEA	90%CI	SRMR
Model .	χ^2 = 786, p < .001	.66	.62	.122	.113;.131	.095
Model 2	X^2 = 424, p < .001	.87	.84	.078	.068;.088	.081

S o u r c es: Own work

Scale Reliability Statistics

The questionnaire is characterised by high Cronbach's α and McDonald's ω reliability coefficients for total score (α,ω = .89). High reliability value was also obtained in factor 1 (α,ω = .85), acceptable values were revealed in the remaining factors (Cronbach's α ranged from .66 to 78; and McDonald's ω from .69 to .80) (see Tab. 6). Due to the small number of scale items (factors 2 and 4 consist of only 3 items, and factors 3 and 5 of 4 items), α values in the range of .45–.60 are acceptable (Taber, 2018). Moreover, the calculated values of the McDonald's ω for all e-learning burnout indicators are within the range of acceptable values, i.e. above the minimum value of ωh = .50, and in factors 1,2 and 5 even exceed the value indicating very good reliability, i.e. ωh = .75 (Ciżkowicz, 2018).

Table 6
Reliability of the E-SBS scale

Scale	Cronbach's α	McDonald's ω
Factor 1. Loss of educational interest, motivation and aspirations	.85	.85
Factor 2. Burnout due to parents' pressure	.77	.80
Factor 3. Negative attitude towards school	.66	.69

Factor 4. Study disappointment	.73	.73
Factor 5. Study exhaustion	.78	.79
E-learning Student Burnout Total score	.89	.89

S o u r c es: Own work

Examination of Convergent Validity

The 29 parent-adolescent dyads were examined in order to test the accuracy of the E-SBS scale with the comparison objective measure of burnout symptoms, namely perceived student burnout level by parents (SBO scale results). The e-learning burnout total score significantly positively correlated with perceived burnout symptoms by parents measured with SBO scale (rho = .48, p = .008); three distinguished factors were also significantly positively associated with SBO (factor 1: Loss of educational interest, motivation and aspirations rho = .47, p = .010; factor 3: Negative attitude towards school rho = .51, p = .005, and factor 4: Study disappointment rho = .40, p = .030).

The burnout model Job demands-resources (JD-R) states that the depletion of personal resources and overwhelming organisational demands leads to chronic distress, which in turn causes the development of burnout syndrome. Additionally, burned-out individuals suffer because of chronic exhaustion, anhedony, a present cynical attitude towards job-related duties and feel insufficient in their occupational role. As a longitudinal adverse outcome of burnout, low self-esteem and loss of mental health and well-being are characterised. A similar path was confirmed in the educational version of the JD-R model, i.e. Study-demands resources (SD-R). Hence, it was assumed that burnout symptoms will be negatively related to psychological well-being indicators. As presented in Table 7, E-SBS total score significantly negatively correlated with students' well-being, autonomy, environmental mastery and self-acceptance (r ranged between –.15, p < .05– –.37, p < .0001). Students' well-being was correlated with three components of e-learning burnout, e.g. factors 1, 2 and 5 (r ranged between –.19, p < .05– –.26, p < .0001). Two well-being indicators were mostly related to e-learning burnout components, i.e. environmental mastery (r ranged between –.18,p < .05– –.34, p <.0001), and self-acceptance (r ranged between –.20, p < .01– –.28, p < .0001). Personal growth, positive relations with others and purpose in life were not significantly related to e-learning burnout indicators (see Tab. 7).

Table.7
Pearson's correlation coefficients

Well-being indicators	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	E-SBS total score
Autonomy	–.18*	–.01	–.12	–.02	–.11	–.15*
Environmental mastery	–.34***	–.21**	–.19**	–.18*	–.33***	–.37***
Personal growth	–.09	–.18*	.06	.05	–.03	–.06
Positive relations with others	–.06	–.13	.04	–.01	.03	–.05
Purpose in life	–.13	–.12	.07	–.06	.01	–.08
Self-acceptance	–.22**	–.20**	–.14	–.22**	–.28***	–.30***
Well-being	–.26***	–.22**	–.08	–.12	–.19*	–.26***

N o t e : *** p < .0001; ** p < .001, * p < .05

S o u r c es: Own work

E-learning burnout syndrome among Polish adolescents: sex and age differences

Existing studies have viewed student burnout as a gender sensitive characteristic, with girls being more prone to develop it compared to boys (Tomaszek & Muchacka-Cymerman, 2019). The findings of the surveys conducted during the COVID-19 pandemic also confirmed the above-mentioned regularity. Hence, the additional aim of the current study was to characterise the e-learning burnout syndrome in the subgroups distinguished by sex and age of the adolescent. Due to significant inequality of subgroups regarding gender ($\chi^2 = 7.76$; $p = .005$), the comparisons were limited to the nonparametric analysis U Mann-Whitney test and basic descriptive statistics among particular groups.

Table 8
Gender differences in E-SBS scores

E-learning burnout indicators	Girls (N=112)		Boys (N=74)		z	p
	M	SD	M	SD		
Factor 1	26.63	7.80	25.78	6.77	–1,15	,252
Factor 2	6.79	3.34	6.54	2.79	–,12	,903
Factor 3	13.62	3.45	13.91	3.12	–,65	,518
Factor 4	9.57	3.03	10.19	2.98	–1,35	,179

Factor 5	13.97	3.96	12.69	4.04	–2,07	,038
E-SBS	70.58	16.54	69.11	13.62	–,94	,346

N o t e : Factor 1 – Loss of educational interest, motivation and aspirations; Factor 2 – Burnout due to parents' pressure; Factor 3 – Negative attitude towards school, Factor 4 – Study disappointment, Factor 5 – Study exhaustion E-SBS – E-learning burnout total score

S o u r c es: Own work

The analyses regarding age in terms of stage of development also revealed significant inequality in the subgroups number ($\chi^2 = 50.94$; $p < .0001$), therefore the Kruskal-Wallis test was performed in order to conduct comparison analyses. Regarding adolescent age, the participants were divided into three subgroups following the stage of development: early adolescence (11–13 years old), middle adolescence (14–16 years old), and late adolescence (17–19 years old). Early, middle and late adolescence students evaluated their overall burnout level in e-school and in pandemic conditions similarly (the differences were statistically insignificant – $\chi^2 = .92$, $p = .633$). However, late adolescents felt burned-out significantly stronger due to parental pressure than early and middle adolescents ($\chi^2 = 20.09$, $p < .0001$, Tuckey post hoc tests equal to 3.06, $p < .0001$ and 1.63, $p = .002$, respectively) (see Tab. 9).

Table 9
Age differences in E-SBS scores

E-learning burnout indicators	Early adolescence (N=20)		Middle adolescence (N=99)		Late adolescence (N=67)		Chi -square	p
	M	SD	M	SD	M	SD		
Factor 1	23.80	6.04	26.00	7.39	27.48	7.64	5.06	.080
Factor 2	8.55	2.95	7.12	3.18	5.49	2.67	20.09	< .0001
Factor 3	13.05	3.17	13.43	3.40	14.37	3.18	4.44	.108
Factor 4	9.55	2.93	9.56	2.99	10.28	3.06	2.88	.237
Factor 5	13.70	3.89	13.29	4.02	13.64	4.14	.42	.810
E-SBS	68.65	15.60	69.40	15.50	71.27	15.41	.92	.633

N o t e : Factor 1 – Loss of educational interest, motivation and aspirations; Factor 2 – Burnout due to parents' pressure; Factor 3 – Negative attitude towards school, Factor 4 – Study disappointment, Factor 5 – Study exhaustion E-SBS – E-learning burnout total score

S o u r c es: Own work

Additional analyses showed that there was no significant correlation between age and the E-SBS total score ($r = 0.07$; $p = .313$). However, age correlated

positively with factor 1: Loss of educational interest, motivation and aspirations ($r = .18$, $p = .016$) and negatively with factor 2: Burnout due to parental pressure ($r =. 24$, $p < .0001$). The remaining factors (3–5) were insignificantly related to age.

Discussion

The main aim of the current study was to examine the psychometric properties of the E-learning Burnout Scale (E-SBS). The E-SBS was developed in response to new stressful conditions of remote education caused by the COVID-19 pandemic.

The five-dimensional structure of the e-learning burnout was examined with EFA, which revealed 5 factors with eigenvalues > 1, and the model explained about 62% of the total variance. The additional EFA revealed good model fit indexes with RMSEA = .059, 90CI[.04,.07]. All item loadings were greater than criteria .40, and only two statements simultaneously loaded other factors (items 3 and 21). The results of CFA yielded the acceptable fit indexes for the model with five components, i.e. Chi-square/df value was low, = 2.13 (< 5.0), RMSEA = .078, 90CI[.07,.09] (< .08), CFI = 0.87 (the value ranged between 0.85 and 0.90 indicating a good fit (Kline, 1994; MacCallum et al., 1996; Kline, 2005). To sum up, based on the EFA and CFA results, the five-factor structure of the e-learning burnout was confirmed. Hence, the multidimensional structure of e-learning burnout syndrome hypothesized in H1 was confirmed. The second study hypothesis assumes that all components of e-learning burnout syndrome will be interrelated to each other. This study hypothesis was confirmed (only Factor 2 and 3 were insignificantly associated to each other). To test the psychometric properties of the E-SBS the Cronbach's α and McDonald's ω coefficients were calculated. The results confirm a good reliability of the tool (E-SBS total score reached 0.89), and it can be successfully used in adolescence population.

In order to test the accuracy of the E-SBS scale, its scores were correlated with an instrument that measures perceived burnout symptoms by parents (SBO scale). We hypothesized that parents will observe the negative emotional and behavioral symptoms of student burnout, and that these will correlate with the E-SBS scores (H3). The results showed positive associations between E-SBS scores and SBO. These findings confirmed that the subjective student's feeling of experiencing burnout with remote learning may also be observed in their behavioral and emotional reactions by parents. The classical burnout literature indicates negative changes caused by exhaustion and observed by relatives (Tucholska, 2009). Similarly, Tomaszek and Muchacka-Cymerman (2018) found changes in the quality of relationships with parents and classmates related to burnout symptoms.

An additional aim of the current study was to analyse e-learning burnout levels in terms of demographic variables, e.g. gender and age. Overall, the findings did not confirm the statistical significance of both, sex and age differences. Thus, the hypotheses 4 and 5 were not confirmed. Although study exhaustion was significantly higher among girls compared to boys, late adolescents aged 17–19 scored significantly higher on burnout due to parental pressure than younger peers in the early and middle adolescence group. The lack of significant differences could result from the moment at which the survey was conducted. Burnout is a phenomenon extended over time that increases gradually; perhaps the difficulties described by young people were minimised due to the fact that they were during and just after the Easter break and the COVID-19 pandemic third wave, which was related to the information about school openings and returning students to in-person learning. In general, it is acknowledged that burnout symptoms develop with the educational stage, and children become more burned-out as they transition into adolescence. In our study, we observed such an increase in e-learning burnout, although the differences were very small. These results may suggest that the e-learning burnout process increases at a slower rate than traditional school burnout and its symptoms are more subtle, perhaps not identified by students who know modern technologies well.

The second aim of the study was to examine the negative association between e-learning burnout and psychological well-being during the pandemic of Covid-19. Negative correlations between e-learning burnout syndrome and adolescents' subjective psychological well-being were confirmed (H6). The findings are consistent with our assumptions and previous empirical and theoretical studies. For example, Lesener et al. (2020), on the basis of classical and well-established job demands-resources (JD-R) burnout theory, introduced the novel study demands-resources (SD-R) approach. The SD-R model refers to academic settings' salutogenic and pathogenic effects on students' health and well-being. The authors empirically confirmed that overwhelmed study demands lead to student burnout, whereas study resources buffer the risk of developing this syndrome. Moreover, student burnout predicts lower life satisfaction. It is worth mentioning that the associations between burnout syndrome and well-being are complex, and some authors did not find a direct significant relationship. According to Andriyani et al. (2017), school burnout served as a predictor of well-being only indirectly via state and trait anxiety.

In our study, two main facets of well-being were significantly associated with e-learning burnout, namely environmental mastery and self-acceptance. These results suggest the crucial role of the school in developing positive self-esteem and emotional health. Moreover, our findings suggest that school-related problems may affect different aspects of well-being. In addition, in our study we used the Psychological Well-Being Scale by Carol Ryff; however, it seems important to examine a more relevant aspect of this personal characteristic, i.e.

students' well-being. The Konu & Rimpelä (2002) School Well-being Model is a four-dimensional phenomenon associated with both teaching and education, and learning and achievements. The authors distinguished school conditions (having), social relationships (loving), means for self-fulfillment (being), and health status. Each well-being aspect is directly related to the students' capabilities and resources important in their life in school. Based on such a theoretical framework, it seems more relevant to capture the feelings, attitudes, and difficulties experienced by students, including the school burnout process as a predictor of study well-being depletion. Nevertheless, our results confirmed the strong need for providing school services that can make students feel more comfortable, secure, and prosperous at school – both in a natural and virtual environment.

Future directions for using the E-learning Burnout Scale and study limitations

The new measurement of e-learning burnout symptoms for adolescents will be useful as a screening tool to identify students who have difficulties in studying remotely with reduced teacher face-to-face contact. Identifying these pupils will offer the opportunity for additional interventions, e.g. additional lessons, an increase in teachers' availability, or e-tutorials. What is more, even though the COVID-19 pandemic is in retreat and most schools have reverted to the traditional way of teaching, the E-SBS scale may be used in situations where schools, classes, or individual students temporarily will be forced to undertake distance learning. Because of several advantages related to distance learning, we believe that education via the Internet and other modern techniques have great potential and will probably be used in the future as an additional tool supporting the didactic process, implemented regardless of health-related conditions, and therefore a part of school education will be conducted via these new technologies. As such, the e-school environment should be taken into account when exploring adolescent mental health and educational problems.

One of the new and important findings of this research was a statistically significant relationship between e-learning burnout and psychological well-being, mostly environmental mastery and self-acceptance. The results indicate the need to pay attention to these two aspects of the pandemic Covid-19 functioning of adolescents as the most endangered areas of mental health. Many psychotherapeutic societies now report that one of the factors influencing adolescents in various forms of self-harm is actually the lack of self-acceptance. In order to counteract the feeling of lack of influence and control over the environment, it is necessary to develop the online and social competence of youths. It is also crucial to implement preventive programs that enhance the ability to manage stress and foster personal and coping resources. One such form would be prevention carried out in schools, with an emphasis on strengthening adolescents' resources and insights. Also, teachers, through such programs, would be one of the protective factors (by paying attention to troubling symptoms) of adolescents.

The current research project was focused on E-SBS validation and has several limitations. Although the psychometric properties of the E-SBS scale are promising, the study sample was small, thus any further generalisation on the whole adolescent population is restricted. Moreover, a research sample size was not properly differentiated in terms of gender and age, which limited determining whether the sex differences and those between the age sub-groups were statistically insignificant in most e-learning burnout indicators. Accordingly, a more diverse and representative sample must be examined in the future validations of E-SBS scale. It would also be necessary to conduct a study on a larger group of environmentally diverse students (large city, small town, village). In addition, the main goal of the study was to develop a tool for assessing burnout symptoms directly related to the e-school environment. Due to this fact the E-SBS scale can be used only to examine students' at-home e-learning burnout. In addition, the rapid development of modern technologies – also in the context of educational tools – may cause the behavioural symptoms of e-learning burnout to change as well, therefore the structure of the phenomenon may also become fragmented. In further research work, it is worth taking into account the other educational stages, e.g. children from primary schools and university students, especially as in the burnout literature some studies suggest a different structure of the symptoms related to the educational level. It is also necessary to consider other reasons why a student may be experiencing burnout, i.e. problems at home or pre-existing mental disorders. We investigated the 22-item instrument and, in further analyses, a shorter version of the scale may be considered. In order to increase technological difficulties related to e-school teaching and more stressful conditions of distance learning, there is also a need for developing an adequate measurement for e-teaching burnout syndrome among the teacher population.

Conclusions

The following article presents the results of the validation of the E-learning Burnout Scale in an adolescent sample. To the best of our knowledge, this was the first attempt to develop and validate an instrument for measuring this new phenomenon in the youth population. On the basis of the psychometric properties, the E-SBS scale of the examined tool has a good validity and reliability, thus the tool itself can be successfully used in scientific practice in the e-school environmental context and be subject to further validation processes. Additionally, after the experiences of students and teachers – as well as the research conducted in the topic of e-burnout and remote work – it seems necessary to introduce mandatory training for both teachers and students, in addition to parents of students, on both

the subject of materials and hygiene of remote work, as well as psychological aspects related to the risk of online workload. In addition, teachers should use some of the materials in the course of conducting lessons using modern technologies – this will enable rapid adaptation to the new conditions of online work in the future and will help to make stationary lessons more attractive. Higher awareness among teachers about e-burnout and its consequences will also affect the student-teacher relationship positively. In addition, an important aspect is paying attention to the school climate, in which the student will feel part of a larger system.

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Katarzyna Tomaszek, Agnieszka Muchacka-Cymerman

Wypalenie uczniów w środowisku e-szkoły: wyniki badań pilotażowych walidacji skali wypalenia e-learningowego

S t r e s z c z e n i e

Pandemia COVID-19 spowodowała powszechne zamknięcie szkół, co zmusiło uczniów do nauki w domu przez Internet. Jednak dla niektórych studentów nauka zdalna okazała się zbyt stresująca i stanowiła za duże wyzwanie (Bilal et al., 2022). Badania wykazały, że pomimo zalet zajęć w trybie online, istnieją liczne zagrożenia, np. niższe osiągnięcia naukowe, mniejsze zaangażowanie i cele powiązane z unikaniem pracy, większy poziom depresji i nerwowości (Daumiller et al., 2021; Srivastava et al., 2021) oraz wypalenie szkolne (Salmela-Aro et al., 2022). Ponieważ wcześniejsze badania dotyczące wypalenia szkolnego u uczniów dotyczyły głównie tradycyjnej nauki stacjonarnej, bardzo potrzebne jest opracowanie instrumentu umożliwiającego mierzenie symptomów wypalenia uczniów w przypadku nauki przez Internet. Celem tego badania było przeanalizowanie zasadności stosowania skali wypalenia e-learningiem wśród populacji młodzieży. Skala wypalenia e-learningiem

(E-SBS) została zaprojektowana w szczególności do pomiaru wyczerpania i trudności w nauce spowodowanych przez zamknięcie szkół podczas pandemii COVID-19. Skala wypalenia e-learningiem, zdefiniowana jako konstrukcja pięciowymiarowa, obejmuje myśli, uczucia i zachowania związane z trudnościami w nauce, których doświadcza młodzież podczas lekcji online. Wyniki potwierdziły, że E-SBS jest racjonalna pod względem psychometrycznym w zakresie pięcioczynnikowej struktury, trafności treściowej i trafności różnicowej. Zatem skala E-SBS wykazała się potencjałem do zastosowania w różnych obszarach edukacyjnych.

S ł o w a k l u c z o w e: syndrom wypalenia e-learningiem, młodzież, edukacja, walidacja psychometryczna

Katarzyna Tomaszek, Agnieszka Muchacka-Cymerman

Burnout de los estudiantes en el entorno de E-School: resultados del estudio piloto de la validación de la Escala de Burnout de E-learning

R e s u m e n

La pandemia de COVID-19 provocó el cierre masivo de las escuelas y, por lo tanto, obligó a los alumnos a estudiar fuera de las aulas, en casa, a través de Internet. Sin embargo, para algunos estudiantes la educación a distancia resultó ser un reto y una fuente de estrés (Bilal et al., 2022). Las investigaciones previas revelaron que, a pesar de las ventajas de las clases en línea, existen varias amenazas, por ejemplo, un menor rendimiento académico, un menor compromiso y objetivos de evasión del trabajo, una mayor depresión y ansiedad (Daumiller et al., 2021; Srivastava et al., 2021), y el agotamiento escolar (Salmela-Aro et al., 2022). Debido a que los estudios previos sobre el síndrome de agotamiento de los estudiantes han utilizado predominantemente la enseñanza tradicional en persona existe una gran necesidad de desarrollar una herramienta con el potencial de medir los síntomas de agotamiento de los estudiantes en línea. El objetivo de esta investigación fue investigar la idoneidad de utilizar una escala de agotamiento por aprendizaje en línea con una población de adolescentes. La Escala de Agotamiento por Aprendizaje en Línea – The E-Learning Burnout Scale (E-SBS) fue diseñada específicamente para medir el agotamiento y las dificultades de aprendizaje, causadas por el cierre de las escuelas durante la pandemia del COVID-19. El síndrome de agotamiento por aprendizaje en línea, que se define como un constructo de cinco dimensiones, capta los pensamientos, sentimientos y comportamientos relacionados con las dificultades educativas experimentadas por los estudiantes adolescentes durante las clases en línea. Los resultados confirmaron que el E-SBS es psicométricamente sólido en cuanto a la estructura de cinco factores, la validez de contenido y la validez discriminativa. Por lo tanto, la escala E-SBS ha mostrado potencial para su uso en una variedad de áreas educativas.

P a l a b r a s c l a v e: síndrome de agotamiento por aprendizaje en línea, adolescentes, educación, validación psicométrica

Катажина Томашек, Агнешка Мухацкая-Цимерман

Выгорание учащихся в среде электронной школы: результаты пилотного исследования по валидации Шкалы выгорания в электронном обучении

Аннотация

Пандемия COVID-19 вызвала повсеместное закрытие школ и поэтому вынудила студентов учиться вне класса, дома через Интернет. Однако для некоторых студентов дистанционное обучение оказалось сложным и стрессовым (Bilal и др., 2022). Предыдущие исследования показали, что, несмотря на преимущества онлайн-классов, существует ряд угроз, например, снижение успеваемости, снижение вовлеченности и стремление избежать работы, повышение депрессии и тревожности (Daumiller и др., 2021; Srivastava и др., 2021), а также школьное выгорание (Salmela-Aro и др., 2022). Поскольку предыдущие исследования, посвященные синдрому выгорания студентов, занимались преимущественно традиционным очным обучением, существует большая потребность в разработке инструмента, способного измерять симптомы выгорания студентов в режиме онлайн. Целью данного исследования было изучить целесообразность использования шкалы выгорания при онлайн-обучении в подростковой популяции. Шкала выгорания при онлайн-обучении (E-Learning Burnout Scale, E-SBS) была разработана специально для измерения истощения и трудностей в обучении, вызванных закрытием школ во время пандемии COVID-19. Синдром выгорания при онлайн-обучении, который определяется как пятимерная модель, фиксирует мысли, чувства и поведение, связанные с трудностями в обучении, которые испытывают студенты-подростки во время онлайн-занятий. Результаты подтвердили психометрическую надежность E-SBS в отношении пятифакторной структуры, валидности содержания и дискриминативной валидности. Таким образом, шкала E-SBS продемонстрировала потенциал для использования в различных областях образования.

Ключевые слова: синдром выгорания при электронном обучении, подростки, образование, психометрическая валидизация

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Contributors

Triana Arias Abelaira, MA, Universidad de Extremadura, Spain, email: tariasa@unex.es

Alina Betlej, Prof., PhD hab., The John Paul II Catholic University of Lublin, Poland, email: alinabetlej@kul.pl

Alina Danileviča, Prof., PhD hab., Daugavpils University, Institute of Humanities and Social Sciences, Latvia, email: alina.danilevica@du.lv

Alina Dulia, PhD, Borys Grinchenko Kyiv University, Ukraine, email: a.dulia@kubg.edu.ua

Ruslan Horchynskyi, PhD, Borys Grinchenko Kyiv University, Ukraine, email: r.horchynskyi@kubg.edu.ua

Jarosław Krajka, PhD, hab., Prof. MCSU, Maria Curie-Skłodowska University, Poland, Poland, email: jaroslaw.krajka@mail.umcs.pl; jarek.krajka@gmail.com

Tetiana Liakh, PhD, Borys Grinchenko Kyiv University, Ukraine, email: t.liakh@kubg.edu.ua

Ineta Luka, Prof., PhD hab., Turiba University, Latvia, email: ineta.luka@turiba.lv

Agnieszka Muchacka-Cymerman, PhD, Pedagogical University of Cracow, Poland, email: agnieszka.muchacka-cymerman@up.krakow.pl

Volodymyr Proshkin, Prof., PhD hab., Borys Grinchenko Kyiv University, Ukraine, email: v.proshkin@kubg.edu.ua

Belén Mozo Redondo, MA, Consejería de Educación y Empleo, Spain, email: Bmozor01@educarex.es

Olena Semenikhina, Professor, PhD hab., Makarenko Sumy State Pedagogical University, Ukraine, Head of Department of Computer Science, email: e.semenikhina@fizmatsspu.sumy.ua

Tetiana Spirina, PhD, Borys Grinchenko Kyiv University, Ukraine, email: t.spirina@kubg.edu.ua

Katarzyna Tomaszek, PhD, University of Rzeszów, Poland, Poland, email: ktomaszek@ur.edu.pl

Marzena Wysocka-Narewska, PhD, University of Silesia in Katowice, Poland, Faculty of Humanistic Sciences, email: marzena.wysocka-narewska@us.edu.pl

Artem Yurchenko, PhD, Makarenko Sumy State Pedagogical University, Ukraine, email: a.yurchenko@fizmatsspu.sumy.ua

Kateryna Yurchenko, PhD, Makarenko Sumy State Pedagogical University, Ukraine, email: k.yurchenko@fizmatsspu.sumy.ua

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Contact
International Journal of Research in E-learning
University of Silesia
Faculty of Ethnology and Sciences of Education
Bielska 62, 43-400 Cieszyn, Poland
phone: +48 33 854 61 13
fax: +48 33 854 61 01
email: esmyrnova@us.edu.pl

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