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PRELIMINARY ANALYSIS OF THE DEVELOPMENT AND IMPLEMENTATION OF THE MOOC PROJECT: A CASE STUDY

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Abstract: *This study describes the aims, structure and content of MOOCs "Contemporary ICT tools and innovative methods of creative education", developed by the international research group within the project "Direction to the MOOCs". It sheds light on the pedagogy of its development and the content of the MOOCs modules. The study also analyses the students' feedback after their participation in MOOCs, concerning their satisfaction with the MOOCs content, volume, the course difficulty, and its technical operation. The obtained and analysed data allowed us to trace the positive dynamics between the 1st and 2nd editions of MOOCs implemented in 2020 and 2021 in Polish in terms of their quality and student satisfaction.*

Keywords: MOOCs, Navoica, evaluation, online learning, survey.

INTRODUCTION

Recently, MOOC has been in the centre of all education stakeholders but it must be stressed 'all MOOCs are not created equal' and there are lots of species of MOOCs. This is good and we must learn from these experiments to move forward and not get bogged down in old traditionalist and modernist arguments. MOOCs will inform and shape what we do within and without institutions. What is important is to focus on the real needs of real learners (Clark, 2013).

BACKGROUND RESEARCH

Before the global transfer to online learning in 2019, MOOCs had been actively discussed in the mass media and academic research from the point of view of their credibility, quality of their content and teaching methods, interactivity, theoretical and practical applicability, economic aspects, market strategies, universities' competitions and so on (Jansen & Goes-Daniels, 2016; Sekret et al., 2019a, 2019b).

After returning to the predominantly traditional education, the question of MOOC can be already speculated upon from a position that has been enriched with the abundant experience of online learning synchronously and asynchronously in different learning groups, together with the experience of developing MOOCs and their delivery to students.

In the most common sense, MOOCs are defined as a free web-based distance learning program that is designed for large numbers of geographically dispersed students. Bali (2014), discussing the pedagogy of MOOCs, draws attention to different formats of MOOCs, namely cMOOCs, driven by connectivism and xMOOCs, which were developed as regular university courses converted to a MOOC format (Bali, 2014).

According to the connectivist approach, learning should be viewed as a network phenomenon, influenced by socialization and technology. cMOOCs, driven by a connectivist pedagogy, rely extensively on the usage of social media as a means of constructing knowledge through social connections and evolve in most cases as professional development activities (Bali, 2014; Sekret, 2016). Learners with a high degree of autonomy, flexibility, and technological skill can benefit from cMOOCs, as they can connect with other participants. xMOOCs are influenced mostly by cognitive-behaviorism and some social constructivism (Rodriguez, 2012), are more structured and follow the more traditional pedagogy of face-to-face learning. Finally, they have been modified for an online learning environment.

Among the benefits of MOOCs, regardless of the pedagogy they are based on, these benefits are as follows (Sekret et al., 2019b):

1. Courses are offered free-of-charge to any number of people from anywhere and anytime, enabling access to higher education and beyond for people who cannot afford a formal education and belong to disadvantaged groups.
2. MOOCs can reduce the gap between the skills and aptitudes of university graduates and the needs of the global market by targeting the skills and knowledge which are in a requirement to gain employment.
3. MOOCs can focus on job-oriented training for students of any age and at any stage of their career to adjust to the changing needs of the society and market.
4. MOOCs emerged from the open education movement and are supposed to enable free access to high-quality content and resources, which might be too costly to be produced by one educational establishment or inaccessible for students from different countries, as well as experiencing different kinds of limitations to take up a full education program.

According to the present evidence, the provision of MOOCs in Europe and other continents tends to grow, though the implementation of MOOCs may be hindered

because of diverse languages, cultures, settings, pedagogies, technologies and other reasons (Jansen & Goes-Daniels, 2016; Sekret, 2016, 2019a, 2019b).
Hollands & Kazi (2019), in their discussion of MOOCs, mention that most of the institutions which developed and implemented MOOCs reported that

1. the implementation of MOOCs helped them extend their reach and improve access to their educational services;
2. they managed to succeed in enhancing their institution brand in their country and abroad; and
3. the MOOCs experience inspired many instructors to reconsider their teaching methods and experiment with innovative strategies (Hollands & Kazi, 2019).

The theoretical and practical aspects of developing MOOCs were also widely discussed in multinational contexts (Smyrnova-Trybulska et al., 2016, 2019).
In this study we are going to:

1. describe the structure and the content of MOOCs "Contemporary ICT tools and innovative methods of creative education", which have been developed by the international research group within the project "Direction to the MOOCs", focussing on the content of the modules, their technological accomplishment on the platform "Navoica" and evaluation criteria;
2. analyze the data received as the students' feedback after they participated in the course concerning their satisfaction with the MOOCs content, volume, the course difficulty, as well as its technical operation.

1. ABOUT THE PROJECT "DIRECTION TO THE MOOCS" AND "MOOCS FOR SCIENCES OF EDUCATION"

The project "Direction to the MOOCs" (Project POWER 3.1) includes the creation and implementation of one of the following two types of courses in the form of e-learning. That is an educational course for students as an additional element of the education process at its first or second cycles. Massive Open Educational Course (MOOC) was designed to be available for all attendees.
As is known, MOOCs must be free and available to the public. The courses selected for funding were placed on a specially created platform, and administered by the Ministry of Science and Higher Education.
The platform, based on the Polish Open EdX platform hosts all e-learning / MOOC courses. The Open edX platform is released as Open-Source software under the AGPL license.
The project lasts no more than 24 months.
The minimum number of participants in educational courses is 35, and in the case of Massive Open Educational Courses is 40.
Additional bonus criteria of online courses are as follows:

- Preparation and implementation of the course in a foreign language simultaneously with;
- Prepared courses must be available and conducted for at least 24 months from the project completion date. The MOOC audience includes several categories of users and learners (Figure 1).

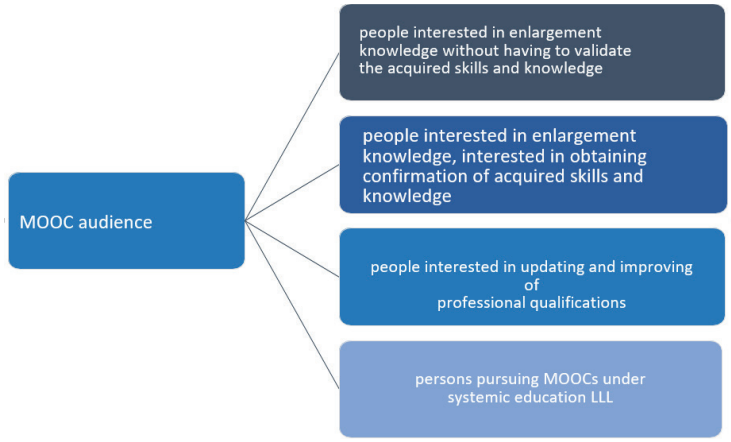


Figure 1. The MOOC audience includes several categories of users and learners

Source: Own work, based on Grodecka, K. et al. (2019).

"MOOCs for Sciences of Education" Project includes five MOOCs:

1. "Contemporary ICT Tools and Innovative Methods of Creative Education." (coordinator dr hab. Eugenia Smyrnova-Trybulska prof. UŚ)
2. "How to Use Commas to Make Sentences Make Sense" (coordinator by dr hab. Małgorzata Bortliczek prof. UŚ)
3. "Entrepreneurship for the Youngest Students" (coordinator Dr. Renata Raszka)
4. "Introduction to Computational Thinking" (coordinator Dr. Tomasz Kopczyński)
5. "Sources of Scientific Information in the Internet Environment" (coordinator dr hab. Eugenia Smyrnova-Trybulska prof. UŚ) (Figure 2).

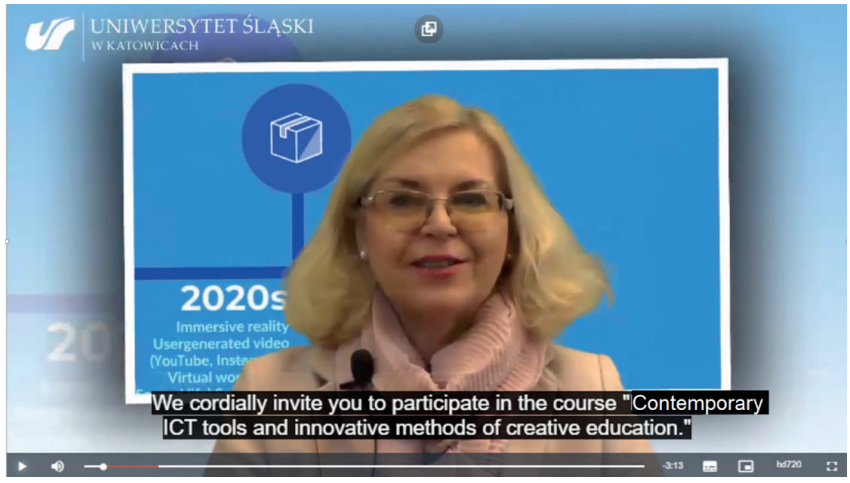


Figure 2. "Contemporary ICT Tools and Innovative Methods of Creative Education" – the MOOCs trailer

Source: www.navoica.pl.

Thanks to the course, "Contemporary ICT tools and innovative methods of creative education" students can learn and expand their knowledge and practical skills on modern tools for the development of various types of infographics, knowledge maps, presentations, video, and digital storytelling.
They can learn the principles of effective use of gamification in education, the methods of the flipped classroom, e-communication and e-collaboration, and online tutoring. The invitation and description of the "Contemporary ICT Tools and Innovative Methods of Creative Education" course are presented in the trailer (Figure 2).
To start the course, students should have:

- basic computer and peripheral skills;
- ability to navigate in application programs;
- skills to use a web browser;
- a basic ability to work with information from traditional and internet sources;
- a readiness to take individual and team actions to improve the quality of the education and self-education process;
- basic skills of working with the Navoica educational platform.

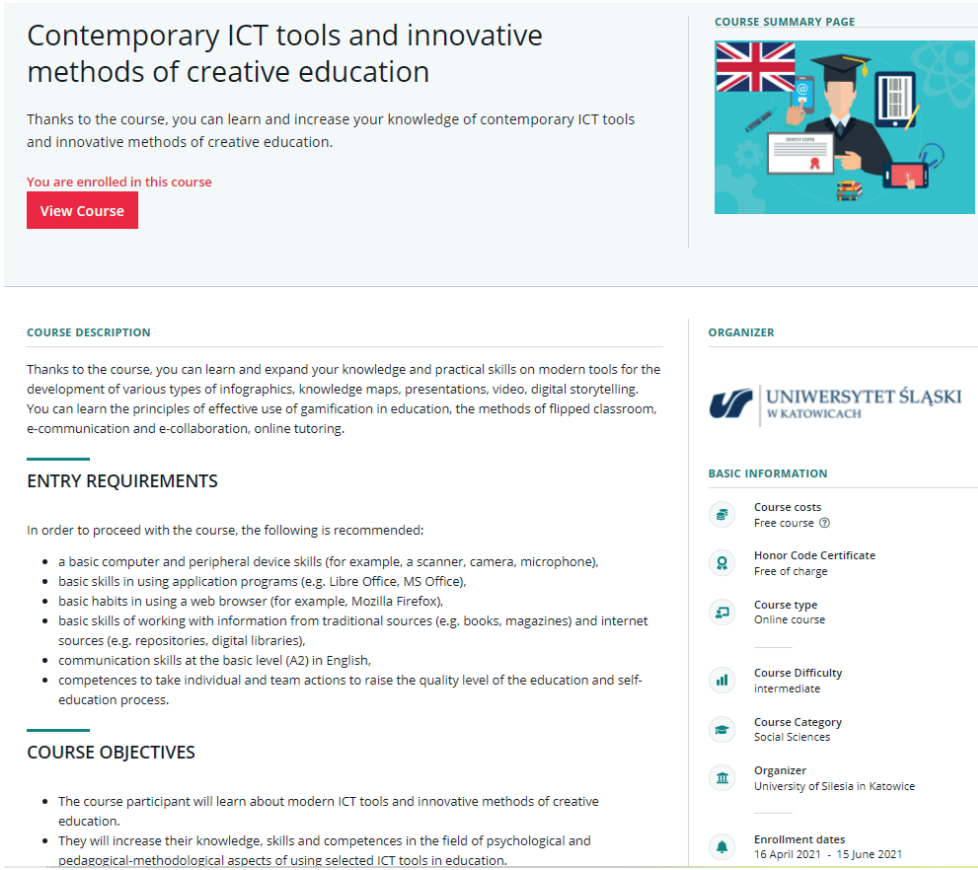


Figure 3. "Contemporary ICT Tools and Innovative Methods of Creative Education" MOOCs description

Among the main course objectives are:

- Learning about modern ICT tools and innovative methods of a creative education;
- Enhancing knowledge, skills and competencies in the field of psychological and pedagogical-methodological aspects of using selected ICT tools in education;
- Developing skills and competencies in the field of practical aspects of using modern ICT tools and active methods in education;
- Learning good examples of conducting education online with the use of selected ICT tools and innovative methods.

MOOCs contain 8 main Modules:

Module 1: The first module discusses infographics and mind maps, what they are for and how they can be used. Students learn the theoretical and methodological foundations, the principles of creating the above-mentioned methods of developing information and supporting learning. Users have an opportunity to follow a comparative analysis of the tools used to create infographics and mind maps, taking into account their advantages and limitations.

Module 2: The second module discusses how to design a professional multimedia presentation. Users can learn about different types of presentations and stages of their creation. Students can also learn about the computer programs used to create presentations, as well as how to make them available on the web.

Module 3: The third module is designed to discuss educational videos and tools which can be used for their creation. Students can become familiar with the varous types and classifications of didactic video. They can also learn the principles and methodology of developing a professional didactic video, as well as what programs can be used for their design. Examples of the practical use of didactic video in education illustrate the content assimilated during the module. The participants also learn what competencies are required to become a creator of professional didactic videos.

Module 4: Participants of the fourth module learn what a digital story is and what it is for. They can become familiar with different types of this tool, principles of its development, and the ICT to be used for its development. The information presented is illustrated with selected examples of completed digital story projects. Participants of this module can also learn what competences a person creating a digital story should have.

Module 5: The module explains gamification, theoretical and methodological aspects of its development, the use of games in education (gamification), their structure, game concepts, the stages of game development, game development programs, websites on the topic, the classification / types of games, as well as the required competences.

Module 6: The sixth module presents selected methods of innovative active teaching-learning, which are important at various educational levels, in particular, in shaping the IT competencies of the university student. It discusses the use of active teaching-learning methods, including problem-based teaching-learning (Problem-based learning, Project-based learning, Inquiry-based learning, flipped classroom (Flipped classroom), teaching – adaptive-learning. In addition, the module analyzes basic psychological and pedagogical aspects of ICT and e-learning to support educa-

tion processes, including the theories of constructivism, connectivism, the scientific aspects of the implementation of the current and immediate development zone, the psychology of constraints, and some others.

Module 7: The seventh module is designed to discuss ICT tools for e-communication and collaboration. In addition, it discusses skills and cooperation in the 21st century and the criteria for effective collaboration, the methodological and practical aspects of using ICT tools for e-collaboration and basic e-communication. The module also provides some examples of tasks on enhancing students' cooperation.

Module 8: The module provides an overview of online tutoring, discussing the psychological specifics of online communication as part of online tutoring; analyzing different online tutoring models and practices. The module outlines ICT tool clusters used for online tutoring, the competencies required of online tutors; discusses the specifics of interactivity and interactive didactic activities. It also describes the specifics of assessment and evaluation, which are conducted online. The module provides guidelines on how to develop and implement an online tutoring course; presenting the most important information on the specifics of managing and administering an online tutoring course.

Organisational conditions: Duration of the entire course – 10 weeks; Number of weekly modules – 8 modules; The number of student working hours throughout the course – 32 hours; The number of student's working hours during the week – 2–6 hours (average 4 hours) weekly.

Among the main methods of MOOCs elaboration were:

- ADDIE (Analyse, Design, Develop, Implement, Evaluate);
- SSADM (Structured Systems Analysis and Design Method);
- SAM (the Successive Approximation Model);
- LLAMA (the Lot Like Agile Management Approach).

The MOOC materials include a lot of different types of graphs and multimedia sources: Schemes, Photos, Graphs, Copy screen, Timelines, Video.

Videos are considered by researchers and educators as one of the most effective type of didactic materials. "Students who had fully watched online video lectures had higher scores on the final exam than others. The analysis can help those who plan to optimize online video lectures in e-learning programs" (Ozan & Ozarslan, 2016).

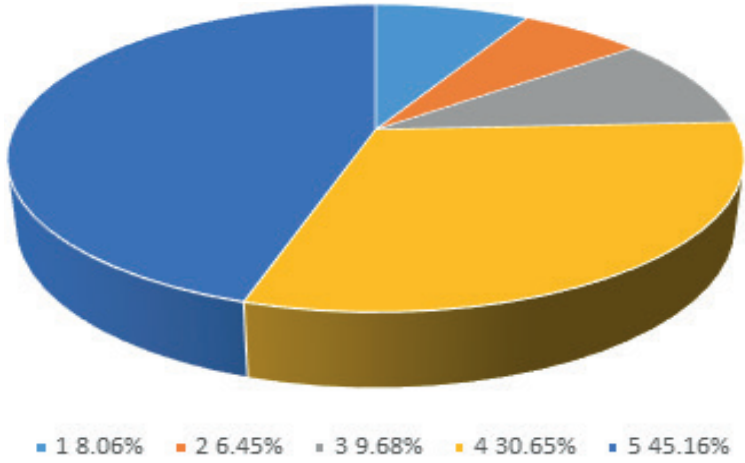
Criteria of evaluation of the MOOC by experts. The main criteria to develop and evaluate MOOC by experts include: a) subject, b) methodological and technical aspects as described in more detail by Grodecka et al. (2019: 34–59), the experts of the Foundation of young science and Novoica.pl.

2. METHODOLOGY AND RESEARCH RESULTS

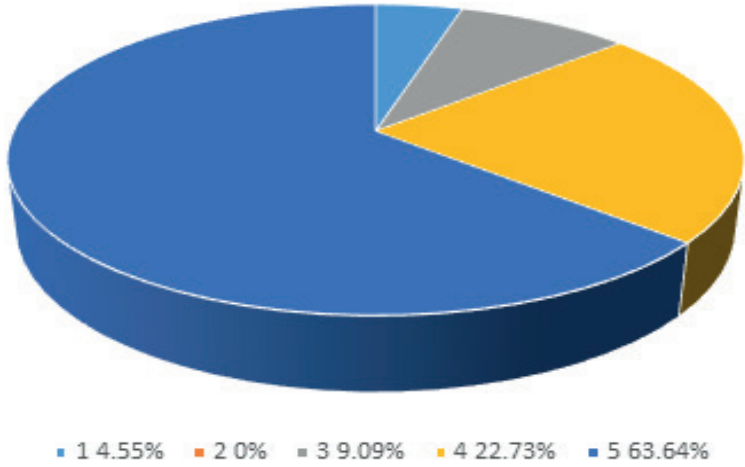
2.1. Methods of data collection, research tools

At the end of course, the students were invited to fill out the survey, specially designed and available in the MOOC to complete. It was used for research and analyses of the students' opinion of the course. The survey contains 14 questions in total. Some results are presented below. In particular, the students were asked about their

opinion in concern of learning and reading in the MOOC (Figure 4, 5) as well as the Navoica platform as a carrier of the course (Figure 6, 7).

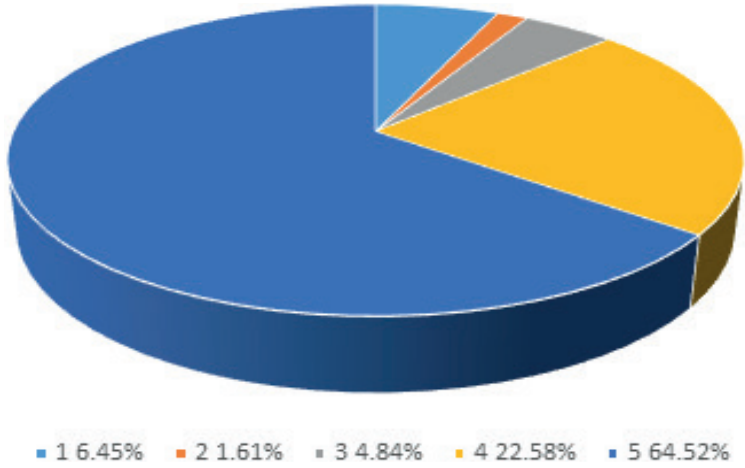


F i g u r e 4. The distribution of the students' responses to the question about their satisfaction with learning and readings – the 1st Polish edition (%) on a scale from 1 to 5 (1 – min, 5 – max)

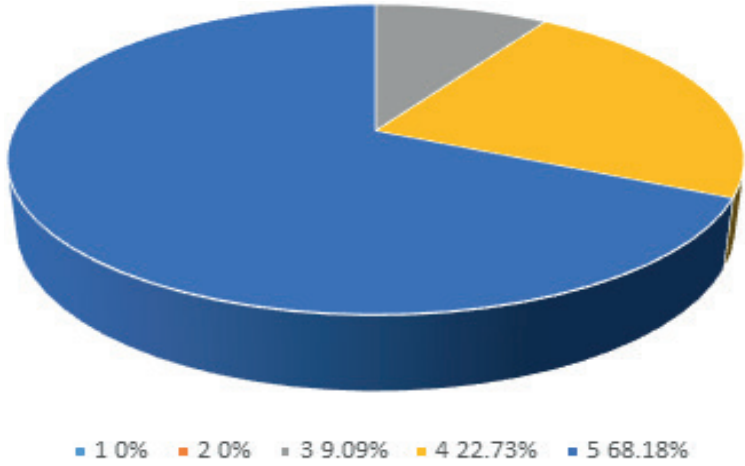


F i g u r e 5. The distribution of the students' responses to the question about their satisfaction with learning and reading (the 2nd Polish edition) on a scale from 1 to 5 (1 – min, 5 – max)

As we can see, the number of students who assessed it with 4 (30.65%) or 5 (45.16%) points increased from 75.81% in the 1st Polish edition to 86.37% (4(22.73%) and 5 (63.64%)) in the 2nd edition. The improvement of the text content, its optimisation and differentiation had a positive impact and conditioned the students' opinion. It has significantly improved.



F i g u r e 6. The distribution of the students' responses to the question about the students' satisfaction with the Navoica platform (the 1st Polish edition) on a scale from 1 to 5 (1 – min, 5 – max)



F i g u r e 7. The distribution of the students' responses to the question on their satisfaction with the Navoica platform (the 2nd Polish edition) on a scale from 1 to 5 (1 – min, 5 – max)

The analysis of the answers on the question, concerning the students' satisfaction with the Navoica platform of the respondents survey, shows that the number of students who assessed it with 4 or 5 points increased from 22.58%+64.52% (total 87.10%) in the 1st Polish edition up to 22.73%+68.18% (total 90.91%) in the 2nd edition with a little increase. The Navoica platform based on Open EdeX system is permanently improved, updated and becomes more stable and reliable.

The distribution of the students' responses to the question about the volume of the course and its adequacy according to their expectations (Too short, or Just the right length, or Too long) is presented in Figure 8.

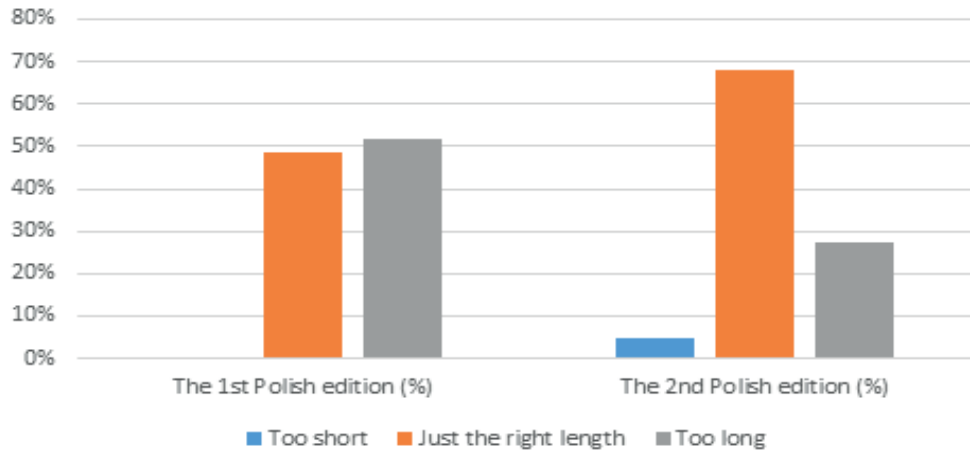


Figure 8. The distribution of the students' responses to the question about the volume of the course and its adequacy according to their expectations (Too short, or Just the right length, or Too long)

The analyses of the answers, concerning the students' opinion on the volume of the course and adequacy according to their expectations (Too short, or Just the right length, or Too long), shows that the number of students who choose the answer "Just the right length" increased from 48.39% in the 1st Polish edition up to 68.18% in the 2nd edition. The MOOC was improved by the authors, its volume was updated and optimized according to the suggestions and expectations of the students and their opinion received after the MOOCs 1st edition.

The distribution of the students' responses to the question concerning the level of the course difficulty according to their expectations (Too easy, or Just the right difficulty, or Too hard) is presented in Figure 9.

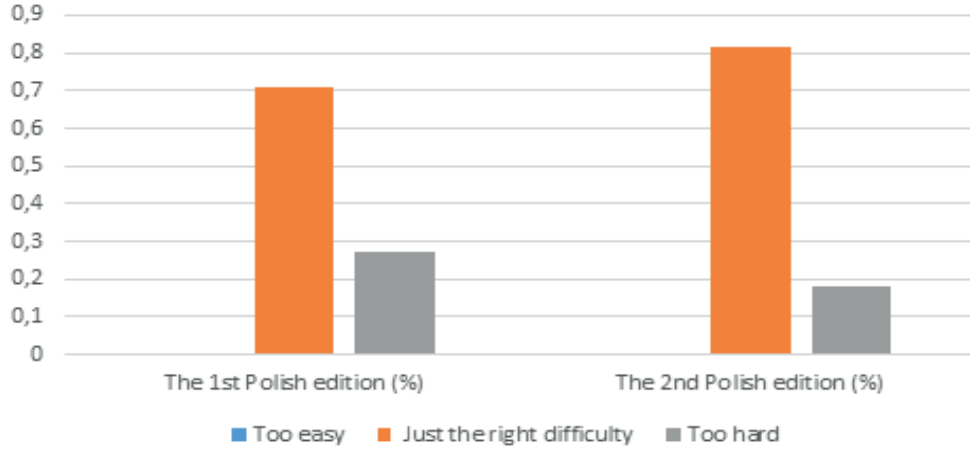


Figure 9. The distribution of the students' responses to the question concerning the level of the course difficulty according to their expectations (Too easy, or Just the right difficulty, or Too hard)

The analyses of the answers on the question concerning the students' opinion on the level of difficulty of the course (Too easy, or Just the right difficulty, or Too hard) shows that the number of the students who choose the answer "Just the right difficulty" is high and additionally increased from 70.97% in the 1st Polish edition up to 81.82% in the 2nd edition. The MOOC was improved by the team of authors and its level of difficulty was adjusted according to the suggestions and expectations of the students, received after the MOOCs 1st edition. The improving process will continue. The survey also researched students' opinions if the course was interesting for them to follow, whether there were enough tasks and assignments to master the contents of the modules, about the possibilities of contacting the course teaching staff and their peers.

Additionally, the students were invited to fill out a questionnaire and take tests before and after taking the MOOCs. They included questions on the social matrix and those which concerned the students' competencies in the field of contemporary ICT tools and innovative methods of creative education. The deep comprehensive analysis of the students' answers will be published in another paper.

The distribution of the students' responses to the question if they would recommend the course to their friends is presented in Figure 10.

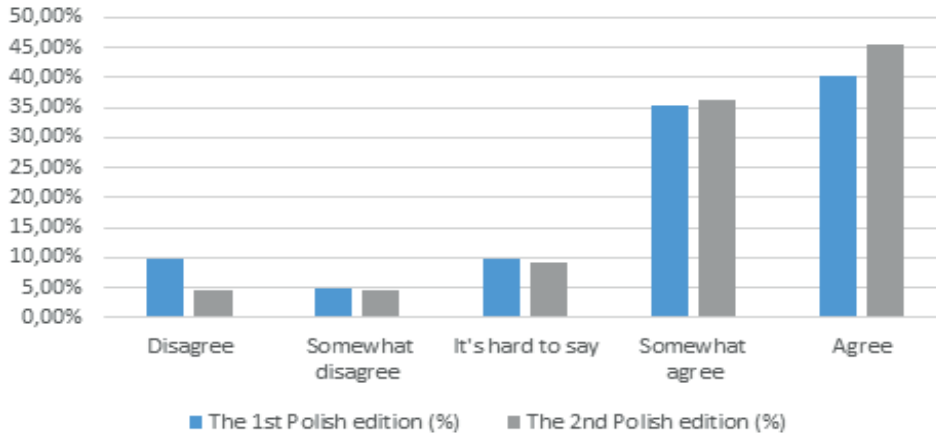


Figure 10. The distribution of the students' responses to the question if they would recommend the course to their friends

In the 1st Polish edition - Somewhat agreed (35.48%) and Agree (40.32%) – answered totally 75.80% and in the 2nd Polish edition – the answers "Somewhat agree" were chosen by 36.36% respondents and "Agree" by 45.45%, in total 81.81%. We can see that the majority of students would recommend the course to their friends and in the 2nd edition this number was even higher.

DISCUSSION

The research on the MOOCs design, implementation and evaluation was conducted by the experts from different scientific fields and areas.

Khalid, Lundqvist, & Yates (2021) elaborated the literature review, which "covers analysis of the recommender systems (RSs) that have been implemented in MOOCs, with the goal of providing insights on the current trends" in practice and research (2021). The research on construction of the quality evaluation index system of the MOOCs platforms based on the user perspective was done by Su, Guo, & Shao (2021). This study "determines the weight of each dimension and criterion by using the best worst method (BWM) (2021).

The research, conducted by Agudo-Arroyo & Callejo-Gallego (2021) "analyzes students' peer review method and provides the results of the online surveys designed to evaluate the MOOC courses" (2021). The study "focuses on determinants of the peer review, such as concrete experience during the course or external aspects, applying multivariate analysis of binary logistic regression" (2021).

We can see that the MOOCs in the focus of the experts' interest and research results are presented in different aspects, concerning their creation, implementation and assessment, including their platforms, course contents as well as the development of the students' competences. The data, obtained by surveying the students who had participated in the course "Contemporary ICT Tools and Innovative Methods of Creative Education" revealed positive dynamics between the 1st and 2nd edition of the MOOCs, implemented in 2020 and 2021 in Polish, in terms of their quality and students' overall satisfaction. Simultaneously, there are additional suggestions, which are going to be introduced in the next CMOOCs edition.

CONCLUSION

The two editions of the course were attended by more than 150 participants, who were the students of the first and second cycle of education within humanities and social studies, and education departments. The participants were reportedly economically inactive who could not afford paid courses and training. There were also participants who wanted to enhance their competencies in the area of contemporary ICT tools and innovative methods of creative education.

The developed MOOC was also adapted to the participation of people with disabilities and special educational needs; compliant with the requirements of Internet publication (WCAG 2.0), in Polish and in English.

It is also expected that the MOOCs, developed within the project "Direction to the MOOCs", will receive more interest from Polish students and participants from other countries with appreciation of the course's contribution to the development of ICT competencies and skills. After the first and second edition, accompanied by the students' surveys, the MOOCs will be improved accordingly before its third and other editions.

The whole project was aimed to develop the MOOCs which are up-to-date, meeting current needs for digital competencies and ICT skills, following the most recent best practices and theories in online learning. It is also believed to be in need especially in the period of the pandemic for the training of pre-service teachers and educators, and providing opportunities for further professional development of in-service teach-

ers, university instructors, researchers and all other MOOCs users to enhance their digital competencies and ICT skills.

It is viewed to be of especial importance and necessity in conditions of the COVID-19 pandemic, when the majority of the educational activities moved to the virtual learning space, and e-learning became the main method, form and technology of learning and teaching in educational establishments at all levels.

This research is planned to be developed further to provide a deeper and more detailed analysis of the students' experience in MOOCs, considering their opinions on whether the course was interesting for them to follow, the adequacy of tasks and assignments to master the contents of the modules, the possibilities of interacting with the course teaching staff and other students and so on.

It is believed that MOOCs is a valuable contribution to the development of the theory and practice of online education, presenting wide opportunities for experimenting and developing effective methods of teaching and learning online.

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