



PRACTICAL TECHNOLOGICAL SYSTEM FOR THE DEVELOPMENT OF INFORMATION COMMUNICATIVE COMPETENCE OF FUTURE TEACHERS BASED ON DIGITAL TECHNOLOGIES

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ANNOTATIONS

The purpose of this work is to identify the transformations of communicative functions. These functions are associated with the subjects of communication in both fields: in pedagogical and organizational, also in the instrumental and design once during the process of creating digital video recordings for online courses. Questionnaires, observation, and factor analysis were used as research methods. It helped to formulate a popularity rating of digital tools for future teachers. The study was conducted at the Institute of Psychology and Education. The study involved 120 people: teachers developing online courses and students studying at the pedagogical educational programs. Transforming indicators of pedagogical communicative competence are highlighted. These indicators are needed to be emphasized when improving teacher training. It will help future teachers to be able to effectively carry out their activities in digital educational environment. These indicators are: the ability to organize interactive cooperation during training, the ability to organize mutual exchange and development of students, the ability to create an open environment for analysis and improvement. The methodological aspects of the development of pedagogical communication functions in the dynamic environment of digital education and an interactive environment are disclosed on the basis of work with videos. Some recommendations for future teachers' skills improving and development of training experience organization in the digital environment are given. These are a clearly-set goal for educational video materials, adequate video content, skills for digital tools using, also the skill to choose adequate digital tools for a task fulfillment. The tool that can enhance enthusiasm, and stimulate students for productive work in a digital environment. The study allows improving video content and increasing the effectiveness of its use in the educational process. Also, the results of the experiment can become a basis for teacher training programs improving. Especially it can be useful for future teachers' pedagogical communicative and digital competences development. The tasks developed within the frame of the research will be included in the assignments of pedagogical internship for pedagogical Master's degree courses at the Institute of Psychology and Education. These tasks for students include development and use of online courses with video materials.

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Keywords: pedagogical communicative competence, digital educational environment, digital video recordings, educational videos, online courses

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INTRODUCTION

During the process of post-industrial society forming, communicative competence acquires special features and significance. In this process information is one of the most important values and a means of goals achieving. The main efforts of society members are aimed at obtaining, processing, and using information, including in the process of interaction. In the current situation related to the switching of education to distant learning format, the communicative competence of the teacher has become in special demand. The emphasis shifts from the organization of effective interaction of students in the audience to the organization of the



educational process in the online format, where it becomes more important to convey the necessary information and track the student's absorbing new information for using it further in his independent work.

The modern development of digital technologies requires professional teachers with a personal and professional approach to global issues of civilization in the context of rapid integration processes at the world level, digital competence for the optimal use of digital technologies in education and upbringing. The main consumer of the products of the education system is the state, which provides higher education institutions with the necessary property and current funding. The requirements for the results of educational activities are reflected in the state educational standards, and the process itself is controlled by regulations. The short-term goals of the state partially overlap with the goals of another group of consumers – employers. The provision of the developing economy with personnel in accordance with current needs, a high level of their readiness to perform the functions of work in professional competencies [1]. Using the SAMR model developed by Ruben Puentedura, we can describe how digital technology affects education and learning. SAMR: Substitution, Augmentation, Modification, Redefinition (<https://www.21c-learning.com>). The model consists of four stages: 1) Substitution: digital technologies replace traditional technologies (for example, typing in Word). 2) Augmentation: digital technologies become a means of optimization in solving educational problems (for example, current, diagnostic or final assessment using Google forms, mobile applications Kahoot, Plikers, etc.) 3) Modification: significant functional changes in the educational process and its interaction participants (for example, the use of blended learning technologies or transfer classes). 4) Redefinition: setting and solving previously unsolved new and new pedagogical problems. Research methods: systematization and formulation of theoretical information (analysis, synthesis, abstraction)

The modern digital educational environment is very dynamic; it provides a constantly updated set of tools for pedagogical communication. The educational information is being transferred and received in the form of lectures, instructions, and videos. It has become one of the basic processes in the training system today during the Coronavirus pandemic. This process is based on the teachers' communicative competencies in combination with their digital skills. Nowadays there is a fairly large number of video sources, that contain a demonstration of different educational activities. We are talking about the use of digital videos, as well as about students who not only watch videos and get information but also try to assimilate it, organize it, and put it into practice. The pedagogical specificity of digital videos usage seems important. The future teacher who watches these videos should also be able to combine various components of his activity. For example, prepare a systematizing theoretical material in advance, think about a motivating block, emotionally convey information to the student, and demonstrate the necessary practical experience. Even though it seems quite simple to work on a computer with instructional videos, it is highly important that make sure that students use active interaction rather than passive perception. It's necessary to organize mutual information exchange between students and their mutual development. The prepared digital materials are supposed to be open for analysis and improvement. It is important to acquire not only subject knowledge but also the ability to use digital tools and develop skills to record video materials that are useful from a didactic point of view. These future teachers' skills are supposed to develop in the process of educational video information absorbing.

They suppose it will become the dominant digital tool. Rickard, McAvinia, and Quirke-Bolt consider teaching future teachers by creating and using video resources as part of a constructive approach. Brunvand's article reviewed methodological guidelines for creating teacher training videos based on best practices. K. Burden and S. Atkinson conducted a study on the effective use of digital video in higher education environment. Also, Blomberg et al. presented an analysis of using of videos as a tool for educators teaching and a reflection of a "development" strategy. McGarr provides an overview of video lectures (podcasts) and their use in education, as well as their impact on traditional learning. He discusses some questions regarding the topic if videos can help to solve some higher education problems in terms of academic performance and if podcasting worth the investment. To find answers for these questions the author examines the vast array of scientific literature published in 2004-2009 devoted to the experience of video-making for higher education purposes. The author comes to the conclusion that purely in terms of assessing student performance, the podcasting effectiveness is still rather weak. It is also proved by a few number of parallel research in general (Khairullina et al., 2020). Nevertheless, it is believed that podcasting has several positive effects on the academic environment.



One of these effects is openness to experimentation with known forms of learning. Also podcasts can help real improvement in the learning environment in case this tool is rationally used as an additional one with other learning activities. It was important to consider the concept of the dynamics of the development of video for the research organization. In the other words, it was necessary to analyze the dynamics of educational videos and the dynamics of communication, as well as teaching communication itself. Our position and understanding of the term “dynamics” was based on a study of publications in this area. The position is described in Wickelgren’s work: “dynamics” is observed as a form of universal position and it is revealed through a range where a significant compromise between speed and accuracy can be achieved. We also consider the dynamics with respect to time cycles. What are the speed changes? What is the length of dynamic change cycles? What is the duration of each dynamic change cycle and what is its time ratio? And, finally, we are investigating the met dynamics concept, which is analyzed here in two directions: a) globally speaking, it is dynamics including the fundamental, most significant changes and laws that these changes are subjected to. These laws have yet to be investigated in the pedagogical aspect, b) in the narrow sense, this is the dynamics of descriptions or the dynamics of metadata. So here we are talking about leading characteristics changes. Also, we consider not only changes in the values of certain metadata indicators, but also a change in the list of these indicators. Taking into consideration the mentioned understanding of the basic term “dynamics”, we consistently consider the designated positions. We analyze the development of video records from the perspective of the historical process. It allows clearly demonstrate the transition to understanding the modern dynamics of educational videos. Considering the history of the information transition with the help of images, it should be noted that the first images, which are known to mankind, are rock paintings. Their main qualitative characteristics of them are schematics, understanding of images, the reliability of “information carriers”. Then we can mark the author’s works of painting art. These images also have characteristics - schemes and understanding of images, reliability of “information carriers. Also, in this case, we should talk about the author’s position and tools and technologies. The transition to video followed the corresponding invention, which conveyed the moving nature of images. Video was complemented by sound and color later. Educational videos are created with the help of the same techniques that characterize video shooting for other purposes. Though using these techniques is not completely mastered in the educational field. The idea of saving and codifying diagnostic data to facilitate the analysis of the educational dynamics process is an object of investigation for the present research. It is noteworthy that modern images and videos do not lose these characteristics. Note that the broadcast video is multidimensional.

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Over the years, a variety of frameworks, models and literacies have been developed to guide teacher educators in their efforts to build digital capabilities in their students that will support them to use new and emerging technologies in their future classrooms. Generally, these focus on advancing students’ skills in using ‘educational’ applications and digitally-sourced information, or understanding effective blends of pedagogical, content and technological knowledge seen as supporting the integration of digital resources into teaching, to enhance subject learning outcomes. Within teacher education institutions courses developing these capabilities are commonly delivered as standalone entities, or there is an assumption that they will be generated by technology’s integration in other disciplines or through mandated assessment. However, significant research exists suggesting the current narrow focus on subject-related technical and information skills does not prepare students adequately with the breadth of knowledge and capabilities needed in today’s classrooms, and beyond. This article presents a conceptual framework introducing an expanded view of teacher digital competence (TDC). It moves beyond prevailing technical and literacies conceptualizations, arguing for more holistic and broader-based understandings that recognize the increasingly complex knowledge and skills young people need to function ethically, safely and productively in diverse, digitally-mediated environments. The implications of the framework are discussed, with specific reference to its interdisciplinary nature and the requirement of all faculties to engage purposefully and deliberately in delivering its objectives. Practical suggestions on how the framework might be used by faculty are presented.

While this conceptualization acknowledges the relevance and importance of technical knowledge and skills, it adopts a wider socio-cultural stance by signaling the need to understand and consider broader implications and effects of digital technologies on individuals and society. It also introduces dispositional and



attitudinal elements—or what Janssen et al. (2013) terms developing a “mind-set” (p. 474) towards technological innovations, in an effort to better understand and critically appraise their role and influence in forming new practices. This represents a considerable challenge for teacher educators, who not only need to better support their students to more effectively utilize digital resources in their future classrooms, but must also help them understand and develop a concern for broader considerations around technology use, and its impacts. Additionally, the notion of competence implies a need for constant revision, reflecting changes to technological systems and uses that, “take into account the evolving nature of technologies”).

This requires teacher educators to constantly reflect on current capabilities and needs and where necessary access professional learning, responding to rapidly changing educational environments and opportunities afforded by emerging technology innovations.

Supporting development of the teacher digital competency framework introduced in this article, a scoping review of literature was undertaken investigating the characteristics of some present frameworks commonly used in teacher education. The purpose of the review was not to develop a definitive summary encompassing all frameworks. Instead, it overviewed frameworks that had been developed specifically for teacher education, made reference to possible application in teacher education, or had been researched and reported on within teacher education contexts, to identify the extent to which they represented a holistic interpretation of digital competence as described by Janssen et al.

To facilitate this, a multi-database search was completed using various combinations of the keywords: teacher, education, teaching, digital, literacy, skills, competencies, ICT, technology, capabilities, information. From the results, a selection of frequently occurring frameworks considered most aligned with teacher education were selected for analysis (i.e., ones conceptualised, implemented or researched in teacher education contexts). A summary of these is presented in “Appendix”. In interpreting the table, different sized black circles have been used to indicate the level of emphasis given in each framework to skills development (S), pedagogical (P) and curriculum (C) changes, dispositional/attitudinal factors (Disp.) and personal considerations (Pers.). These are further defined in the notes section at the bottom of the table.

As indicated in the table there is a solid emphasis in most frameworks on skills development, although only TPACK, the UNESCO framework and to a lesser extent the ISTE standards, explicitly linked these to associated changes in pedagogy and curriculum. Skills generally focused on technical/operational aspects of ICT and information skills—specifically how to use devices and software to access, work with and evaluate information for a range of curriculum and teaching purposes, and the type of thinking associated with this (e.g., analysis, evaluation, critical). The frameworks were also quite different in structure, with the ISTE standards, UNESCO competencies and ICTE-MM maturity model adopting universal ‘checklist’ formats, while the others were more conceptual (broader ideas informing bespoke development). Notably, no existing frameworks included more than a passing mention of personal dispositions/attitudes or understandings of wider issues or safety and wellbeing (etc.) considerations, as components of teacher education students’ digital competence.

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