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## THE DIGITAL COMPETENCE OF TEACHERS: AN INNOVATIONAL CHARACTERISTIC OF THE ESTABLISHED PROFESSIONAL PROFILE

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**Summary:** *The professional competence of teachers as part of their professional profile has been undergoing changes determined by the continuous technological development. The proper definition and identification of the basic competencies (an integration of knowledge and skills) forming the digital competence of the teacher is a relevant vantage point for the design of didactic technological variants for its efficient development and formation. The present paper is an attempt at conceptualizing the framework of the digital competence of the teacher in the context of continuous learning.*

**Key words:** *professional competence of the teacher, digital competence – conceptual definiteness.*

## DIGITALNA KOMPETENCIJA NASTAVNIKA: INOVACIONA KARAKTERISTIKA UTVRĐENOG PROFESIONALNOG PROFILA

**Rezima:** *Profesionalna kompetecija nastavnika kao deo njihovog profesionalnog profila prolazi kroz promene koje su određene neprekidnim tehnološkim razvojem. Tačno definisanje i prepoznavanje osnovnih kompetencija (integracija znanja i veština) koje čine digitalnu kompeteciju nastavnika je polazna tačka za izradu didaktičkih tehnoloških varijanti za njen efikasni razvoj i formiranje. Prikazani rad je pokušaj konceptualizacije okvira digitalne kompetencije nastavnika u kontekstu neprekidnog učenja.*

**Ključne reči:** *profesionalna kompetencija nastavnika, digitalna kompetencija – konceptualna određenost.*

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## 1. INTRODUCTION

The modern design of the professional profile of teachers, their professional competence, and, more specifically, their digital competence as one of the basic components of the latter, prove to be of considerable importance to the future professional realization of educators. The professional competence of teachers and, more specifically, their digital competence are of vital importance to their future professional realization. There is a certain degree of controversy, however, concerning the content and the structure of teacher's digital competence which interfere with its successful formation and development during the education of future teachers. In the theory and practice of education these controversies are commonly related to: (1) misconceptions and inability to differentiate between systematic education of specialists in different spheres (primarily those in technical and engineering specialties) in the field of information technologies, the training of teachers in computer science and information technologies, and the training of teachers in other disciplines as users of such technologies; (2) the inadequate employment of the competence-based approach in the design of the aims of education and its expected results as well as the impossibility to identify the fundamental elements of any competence; (3) the lack of a clear view of the conceptual frame of teachers' digital competence and the possibilities for its successful inclusion in their professional profile; (4) the lack of a conceptual model for the design of special didactic techniques for the formation of the digital competence of teachers within their training as educators.

An analysis of the issue of the formation and development of the digital competence of future teachers in various disciplines such as the one offered above, reveals a series of controversies, the most far-reaching of which seem to be the diversity of theoretical approaches to the definition of the concept digital competence and the inadequate methodological basis of their employment in the process of its formation and development in higher education.

## 2. THE COMPETENCE APPROACH AS A METHODOLOGICAL BASIS FOR THE IDENTIFICATION OF THE STRUCTURE OF DIGITAL COMPETENCE

A variety of approaches, either in combination or each in its own right, are being implemented in educational systems worldwide in an attempt to respond to the demands of a quickly changing social practice. These include: the algorithmic approach, the problem-based heuristic approach, the activity-based personality approach, the personality development approach, etc. As a result of its innovative basis and conceptual completeness, one of the approaches which stands out among the approaches focused on the activity-based development of integral personality characteristics is the competence-based approach, which has recently received wide acclaim and implementation scope in the European Union, Russia, USA, and other countries.

The competence approach is considered an objective necessity related to "a gradual shift of orientation of the dominant educational paradigm from an emphasis on the transfer of knowledge and the formation of skills to the establishment of conditions for the acquisition of a system of competencies defining a potential and abilities for maintaining a stable activities in the context of the multiple factors affecting the heavy informational and communicational load in the contemporary social, political, and economic space" [1].

The competence-based approach is gradually being asserted as an inseparable part of the new educational paradigm without a clear identification of the scope and content of its fundamental concepts competence and competency. The tendency to shift the orientation of the theory and practice of education to a new educational paradigm is deeply rooted in its social and economic context and started as far back as the previous century. The traditional concepts of the qualification of specialists and the educational adequacy of school leavers, usually regarded as the acquisition of a system of knowledge, abilities, and skills, have proved inefficient against the background of technological and scientific revolution in the post-industrial society. Certain concepts and terms now being introduced in scientific discourse are directly related to the competence-based approach and its application to modern educational policies. The complexity, ambiguity, and duality of the concept/event pair “competence - competency” [2], viewed in terms of educational goals and results, are gradually transferred onto the competence-based approach, which provides for the “broad social, economic, reflexive, and cultural context of the activities” performed by students [3].

The differentiation between the concepts competence and competency makes it possible to discern and identify competence as a personality attribute and a subjective characteristic of the individual, on the one hand, and competency as an objective characteristic of the individual, on the other. Their conjoining in a concept-event pair will serve as a starting point for the correct usage of the terms in scientific discourse and for the expedient and adequate design of techniques for their formation and development.

### **3. THE DIGITAL COMPETENCE IN THE PROFESSIONAL PROFILE OF THE TEACHER**

It is a well-known fact that objects and phenomena occur before the terms employed for their denotation come to be established. A preliminary conceptual frame of the properties of any competence, which offer an opportunity for its future contextual and situational interpretation, is predicated on the necessity to construe its invariant characteristics. Different conceptions of the content and boundaries of digital competence, defining it through its “cognitive, relational, and social” character, are popular in the scientific discourse [4]. Taking into consideration its multi-dimensional structure, the difficulties of the conceptual identification of digital competence is frequently related to: (1) the inadequate knowledge of the computer competencies and the competencies for operating different digital sources of information as a basis of digital competence; (2) the impossibility to evaluate it in its totality, especially in long-term perspective; (3) its dependence on other competencies, some of which of meta-cognitive character, which facilitate and predicate its development; (4) its dynamics as a process and phenomenon as well as its social determination. These problematic issues make it difficult to identify the basic competencies of the teacher integrated in his/her digital competence. Considering the integrative nature of the latter, it is often viewed as constituted of a technological, a cognitive, and an ethic component conjoined in a contextualized fashion [4].

These parameters form an adequate basis for the delineation and determination of the major characteristics of the conceptual frame of the digital competence of the teacher, which include:

- ❑ integration of skills and competencies for using up-to-date information and communication technologies and a variety of digital media;
- ❑ abilities for critical evaluation of the content of the electronic information and knowledge of the advantages and disadvantages of digital media;
- ❑ efficient application of digital information processing and storage devices and abilities for adequate communication in different types of environment;
- ❑ skillful employment of information technologies and digital devices in a diversity of activities performed by the teacher combined with an ability to project the respective skills onto a variety of levels: methodological, administrative, qualification-oriented;
- ❑ educational design based on the creative integration of digital media in the context of the subject to be studied which can provide for a learner-centred approach to students' performance and will also enhance the opportunities for the development of skills of cooperation, sharing, openness of expression, reflection, problem management, trust, and responsibility while promoting the sense of security and privacy;
- ❑ design of interdisciplinary educational routes facilitating students' abilities to employ information technologies and digital devices for information processing and storing in their studies at different stages of education in view of their needs defined by their personality, age, and social attributes;

In the context of subject differentiation in education, the aspects of the digital competence of the teacher are further defined, broadened, and enhanced to the effect of acquiring a variegated character, which is manifested in the variant that make its application and content suited for specific educational purposes. The contextual prerequisites for the manifestation of its variants however are not in conflict with the invariant characteristics of the conceptual framework suggested in the current paper. This contributes to the dynamic nature of the digital competence of the teacher, which makes it necessary to re-define it in the context of continuous learning.

#### **4. THE DIGITAL COMPETENCE OF THE TEACHER IN THE CONTEXT OF TECHNOLOGICAL EDUCATION**

In the recommendations of the European Parliament and the European Council for the creating of a European Qualifications Framework for life-long learning, competence is defined as: “ the proven ability to use knowledge, skills and personal, social and/or methodological abilities in work or study situations and in professional and personal development’ [5]. The definition sets the main points of orientation for defining key competences within the fields of the different educational subjects and within the educational profile of the teachers for these subjects, including the technology teacher's profile. As it can be seen within the conceptual framework the orientation points include those invariants of knowledge, skills and attitudes which allow the operationalization of digital competence in the specific Qualifications Framework and in the process of training of technology teachers.

In Bulgaria, technology teachers have been trained since 1984 and the first specialists were trained at the South- West University in Blagoevgrad. Understandably, at first accent was put on the general theoretical and practical education of the future teachers how to operate information and communication technology but this type of training contradicted with the infrastructure of technology education in secondary education grade in all its aspects- curriculum, terminology, contents, didactics, tools and instruments, processes and activities.

In that sense, probably as a compensatory reaction of the systems of secondary and higher education or more likely as a not carefully considered and planned technology innovation the notion of computer literacy was introduced.

The European Credit Transfer System was introduced in South-West University in 2004. This led to changes in curricula, course contents and the professional characteristics of the future graduates. The problem with digital competence, however, was still pending, as it was difficult to picture its actual projections. The idea of digital competence was still locked within the conceptual range of 'knowledge and skills to use ICT' and 'ability to work in the internet space.' It has to be admitted however that in the attempts to follow modern technology education philosophy we stayed stuck on level one- the one of performing certain activities in material environment. This level is mainly described by 'performing certain activities, technology, monotechonology and technical literacy' [6]. This is the case because 'technical literacy' traditionally had a leading role in the 20<sup>th</sup> century philosophy of education. From the point of view based on the principle of unity between the historical and the logical, this level should not be ignored but there should also be a tendency to move on to the next, second, scientific and technological level. This level has been determined by modern reality and is described by 'science, ICT, technology and technology expertise [6]. The main descriptor here, technical expertise, is meant to include in itself the notion of technological literacy, which also has basic functions in the process of forming technology expertise because any type of expertise has two essential elements- information and competence. In this sense we can speak about technology competence and competency, for example but we have to bear in mind that technology expertise also includes the so called 'digital literacy' as defined by A. Calvani, A. Cartelli, A. Fini и M. Ranieri [4]. In contemporary world of technology digital literacy has to be formed and developed alongside technological literacy as they both characterize a modern individual. Thus, the European Parliament and Council have pointed out digital competence as one of the eight key competences essential for the successful personal and professional realization of the individual [7]. It is clear that digital competence is part of technology expertise and it can be defined as being complex and integrative in its nature. Therefore any approach trying to locate it within only computer or only instrumental application will be restricted, inadequate and old-fashioned.

We believe that the right approach to defining the place and contents of digital competence in both curricula and professional characteristics is determining what creates 'the identity' of digital competence. As a result we can speak about 'digital competence of the student' and 'digital competence of the teacher.'

What makes digital competence identity in our opinion is to influence on the following interpersonal relations: 1. individual- environment; 2. individual-individual; 3. individual-science; 4. individual –information; 5. individual-technology. These relations should be projected in all contents reconstructions of technology education and in the reconstructions of the technology teachers' professional characteristics and their training curricula. When this has been completed, we can speak about digital identity of the students in the process of their technology education and about digital identity of the teachers in the process of their training.

## 5. CONCLUSIONS

The competence approach has recently been one of the up-to-date topics in educational space. While making attempts to theoretically analyze and conclude on this topic, educational institutions face a serious problem- the necessity to actually harmonize educational system with the European Qualifications Framework. The difficulties in the process of harmonizing are of different types but what provokes our thought and the efficiency of the educational experts from all levels is the lack of a unified approach for identifying key competence, including digital competence. The analysis made above and the outlined facts help us conclude that digital competence of the teacher is a unique socially determined integral construct with multi-dimensional structure, its own contextual and subject dynamics and meta-cognitive relations. Therefore efforts have to be made in order to make sure that digital competence is not going to be just another provocation of educational modernity but it is going to be properly operationalized and clearly conceptually oriented for students and teachers of all professional and scientific fields.

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