

PLANNING, MANAGING AND LEADING THE DIGITAL TRANSFORMATION OF SCHOOLS

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Abstract

The Digital Maturity Framework for Schools in Croatia has been designed as a part of the e-Schools pilot project that is part of the “e-Schools: a comprehensive informatisation of school operation processes and teaching processes aimed at the creation of digitally mature schools for the 21st century”. It is based on the European Framework for Digitally Competent Educational Organisations. The School Digital Maturity Framework is structured in 5 characteristic areas of the Croatian education system: Planning, Management and Leadership, ICT (Information and Communications Technology) in Learning and Teaching, Development of Digital Competencies, ICT Culture and ICT Infrastructure. According to the 2016-2018 Digital Maturity Evaluation, schools have the lowest level of digital maturity in the areas of Planning, Management and Leadership. Therefore, it can be assumed that majority of schools are not ready for the upcoming digital transformation challenges. The purpose of this paper is to determine which core individual competencies defined by the information constructs, *Knowledge, Skills and Abilities*, significantly set the degree of school management digital maturity. Thereby, the primary objective was to create a new information construct *Experience* and to explore the correlation between relationships of two constructs. Principals of primary schools in the Republic of Croatia were selected as the research sample (860). The survey was conducted using a questionnaire method that contains original metrics of the influencing factors *Knowledge, Skills, Abilities and Experience* on the basis of which the information model was designed. By describing the information model, it is possible to determine the impact of a particular construct on the school digital maturity in the area of planning, management and leadership. Therefore, this paper represents a contribution to the information and communication sciences field and opens initiatives for further interdisciplinary research related to the development of an original methodology for conceptualizing the management of school's digital transformation.

Keywords: Digital transformation, digital maturity, digital competencies, management, school.

1 INTRODUCTION

Contrary to the classical paradigm of the educational system, new currents are emerging in the labor market itself, which are slowly conditioning the arrival of changes in the educational system. The more demanding business market expects the improvement of existing competencies, and at the same time the acquisition of new ones. Digital competence has imposed itself as one of the unavoidable modern competencies. In accordance with the changes that have affected today's students, their teachers are also changing, theirs need to adapt their learning and teaching skills to new generations of students. Back in 2006, the European Union recognized digital competences as one of the eight core competences for lifelong learning [1] in order to successfully respond to the challenges of the development of the knowledge society and the world market. In 2010, digital competences were recognized as one of the key competences in the Europe 2020 strategy [2]. Changes that are happening and modifying the classical teaching process are also happening in business through managing and leading the transformation of the school as a formal education system. The publication of the European Union, *Opening Education to Innovative Teaching and Learning through New Technologies and Open Educational Resources* [3], emphasizes that educational institutions should assess their readiness and ability to use information and communication technologies and adjust their organizational and business models accordingly. The education system is a key element in the development of society in the process of globalization and individualization and the process of constant innovation. System changes are determined by the unstoppable need to acquire new knowledge, skills and abilities, which require good preparation through the concept of analysis, planning and implementation. [4] It is the complexity of the links, among the mentioned goals, that requires specific forms of strategic thinking, planning and management of activities that should result in their realization through the transformation of schools.

Schools as the basic institutions of formal education have not yet fully recognized the possibilities brought by new technologies related to the management, planning and leadership of transformation. The quality of the school becomes dependent on the administration, especially on the principal, his ability to organize the work of the school (management), his professional and pedagogical guidance, the characteristics of his personality and other potentials. School management has become a priority in education policy programs around the world. It plays a key role in improving school performance, has an impact on teachers' motivation and abilities, on the school climate and school environment. Effective school leadership is of the utmost importance for improving the quality of education. [5] Effective school management is determined by personal assertiveness, strong leadership, entrepreneurial skills, and the ability to establish regulatory mechanisms. [6] Luić [7] states that in educational policies around the world, leadership has become a priority and is crucial for the motivation and development of teachers' abilities, for the overall school atmosphere and environment, and for the successful process of digital transformation of schools and digital maturity.

The concept of digital maturity of schools is becoming increasingly important due to the very rapid development and growing importance of information and communication technologies in education. Digitally mature schools for the purpose of creating a framework of digital maturity and measuring the digital maturity of primary and secondary schools in the Republic of Croatia are defined as schools with a high level of ICT integration, systematized approach to the use of ICT in school business and educational processes. The use of ICT in schools should not depend on the enthusiasm of the individual but on a systematic approach that must be planned and implemented by the school, school founders, line ministry, education agency and other relevant institutions. For this reason, the basic areas and elements that contribute to the digital maturity of schools have been identified, so that progress in the integration and use of information and communication technologies can be planned. [8] The digital maturation strategy stems from the results of the pilot project "e-Schools: complete informatization of school business processes and teaching processes in order to create digitally mature schools for the 21st century" started in March 2015. The mentioned pilot project included 151 schools within which the initial and final external evaluation of digital maturity of the included schools was conducted, and the results showed that most schools raised their level of digital maturity in the period between the two measurements (2016 and 2018). According to the same evaluation, schools were found to have the lowest level of digital maturity in the field of planning, management and leadership.

To increase the level of digital maturity for schools, with the important role of teachers, the key role of schools principals as managers in the process of adopting new technologies and approaches to teaching, strengthening organizational and administrative management of schools, employee development planning and institutions in general. In order to be able to talk about successful planning, management and leadership of the digital transformation of schools, it is necessary to have a good overview of the entire system, so that all decisions are based on exact and verified data. All of this includes strategic leadership and information and communication innovation in schools. Improving the quality of school management requires the development of competency standards for principals and the institutionalization of the education of future principals. Primary school principals perform tasks in three areas: 1. the national school system, 2. the school as an organization and pedagogical institution and 3. the application of management in management and work, so the focus of this research is primary school principals as bearers of systematic introduction and implementation of digital transformation of schools. This paper starts from the assumption that most primary schools are not ready for the challenges of digital transformation. The aim of the research was to determine which individual competencies significantly determine the degree of digital maturity of school management and are defined by the information constructs *Knowledge*, *Skills* and *Abilities*. With the introduction of the new information construct *Experience*, it will be possible to explore the correlations between the previously mentioned constructs. Starting from the problem and the goal of the research, set a hypothesis claims that the knowledge, skills and abilities of primary school principals significantly influence the digital transformation of schools.

2 METHODOLOGY

The research was conducted using the questionnaire method on a sample of primary school principals of the Republic of Croatia (860). The questionnaire investigated the competencies of principals using information constructs *Knowledge*, *Skills*, *Abilities* and *Experience* on the basis of which an information model was designed by description that can determine the impact of each construct on the digital maturity of the school in planning, management and leadership. In the introductory part of the

survey, the purpose and goal of the research are presented. The survey contains 15 questions, two of which are sociodemographic structure (gender and age). Closed-ended questions are a combination of multiple choice, dichotomous questions, and questions based on the Likert scale of 5-point attitudes, with a value of 1 (one) being the lowest value and 5 (five) being the highest value. The survey was created in the form of a Google form. The survey was conducted from 11 to 17 September 2020. A link to the survey was sent to the county heads of county professional councils of directors to their official email addresses with a request to forward it to all principals of their county councils. The principals filled out the questionnaire of their own free will.

3 RESULTS

The survey was completed by 195 principals, of which 73% were female principals and 27% were male principals. Of the total number of principals who completed the survey, most of them were in the age group of 51 to 60 years (45%) and in the age group of 41 to 50 years (35%). The lowest number of principals completed the survey was older than 60 and younger than 40 (20%).

Almost a third of principals (27%) have less than 5 years of management experience, and the same number of principals (29%) have 5-10 years of management experience. A smaller number of principals (14%) have 10-15 years of experience, 15-20 years of experience (15%) and more than 20 years of experience (15%). The results show that most principals (56%) have less than 10 years of management experience, and the least (15%) have more than 20 years of management experience.

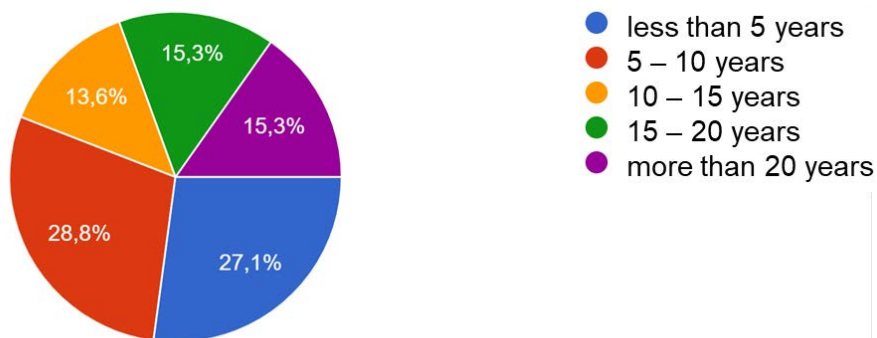


Figure 1. Years of experience as a principal.

Analyzing the results shown in Figure 2, it can be concluded that the sample of respondents are employed in primary schools that range in size from “up to 150 students” to “more than 500 students”. The size of schools is divided into 4 ranks, so in schools with up to 150 students work 24% of principals, from 151 to 250 students 27% of principals, from 251 to 500 students 36% of principals and the smallest number of principals (14%) work in schools that have more than 500 students.

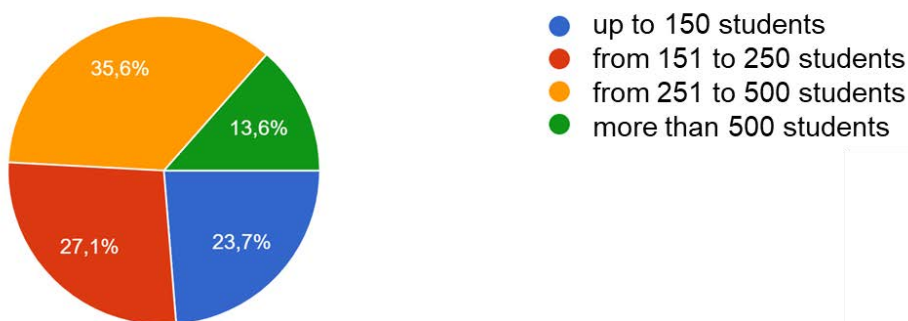


Figure 2. The size of the school according to the number of students.

Looking at the results of the assessment of one's own digital literacy, it can be concluded that almost all principals are considered digitally literate. 98% of principals gave an affirmative answer to this question. By analyzing the results obtained in the following two questions, it can be concluded that the principal's assessment of their own digital literacy is supported by formal or non-formal education in the field of digital literacy. Of the total number of respondents, 12% have completed a faculty in the

STEM field, while 91% of respondents stated that they were educated in the field of digital literacy informally through courses and seminars. Only 2% of principals state that they have no education in the field of digital literacy. Such a result is in line with the principal's self-assessment of their digital literacy. Of the total number of respondents, half (52%) have an ECDL Start diploma, 29% have an ECDL Advanced diploma, and 19% of surveyed principals do not have an ECDL diploma. From these results we can conclude that the principals assess that they have acquired sufficient competencies, knowledge and skills in the field of digital literacy through completed courses and seminars organized as part of the professional development of principals.



Figure 3. ECDL (European Computer Driving License) completed.

According to principals, only 15% of schools have a digital development plan as a separate document. Almost half of the schools (47%) integrate the components of the school's digital development plan into other school documents, and 38% of schools do not have a digital school development plan at all. Given the necessity and obligation to involve schools in the processes of digital maturation and the lack of legal obligation to adopt a digital maturation plan as a separate document, the analysis of the results shown in Figure 4, we can conclude that principals emphasize the need for digital development of the school in school documents that plan the implementation of school processes in the short term (school year) or long term.

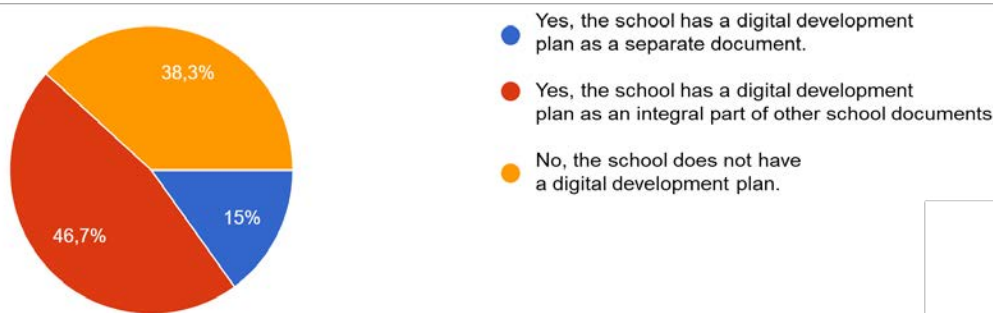


Figure 4. Adoption of a digital development plan in primary schools.

In most schools (60%) the digitalization process is managed by the principal, who takes over the planning, management and decision-making work on the application of digital technology in the teaching, learning and business of the school. In 18% of schools there is a special committee for planning the digital development of the school, which suggests the existence of a professional team within the school, that manages the process of digitalization of the school. In a fifth of schools (22%) digitalization occurs exclusively by decisions of external entities (ministry, CARNET, founder, local government). These results show that in primary schools in the Republic of Croatia there is no single model for planning, managing and leading the digital transformation of schools.

In 80% of schools, according to the principal's estimation, in addition to external training of teachers and professional associates in the field of digital literacy, internal education in this area is organized. From the high assessment it can be concluded that teachers and professional associates were supported in the acquisition of knowledge and skills in the field of ICT with the aim of better implementation in learning and teaching processes.

In the last part of the survey, principals gave their assessments of the impact of the information constructs *Knowledge*, *Skills*, *Abilities* and *Experience* on the digital transformation of schools.

Principals rate their communication skills quite highly. On a scale of 1 (very poor) to 5 (excellent) the average score is 4.21. In addition, the data on the percentage of individual assessments show that more than 90% of principals rated their communication skills with grades 4 and 5.

Table 1. Assessment of own communication skills

%					<i>M</i>
1	2	3	4	5	
0,0	0,0	8,3	61,7	30	4,21

Communication skills in the digital environment are also highly rated by principals. On a scale of 1 (very poor) to 5 (excellent) the average score is 3.95. More than 80% of principals rated their digital communication skills as 4 and 5.

Table 2. Assessing one's own communication skills in a digital environment.

%					<i>M</i>
1	2	3	4	5	
0,0	0,0	16,7	71,7	11,6	3,95

The results presented in Table 3. provide data on the frequency of use of digital communication tools by principals in official communication with teachers and professional associates. On a scale of 1 (least common) to 5 (most common), principals gave estimations for 5 factors (digital communication tools). According to the obtained results, principals in official communication most often use e-mail, which was assessed with a high score of 4.61 by principals, in frequency of use. Slightly less often they use written communication in a virtual teachers room (3.96), communication in Whatsapp and Viber groups (3.78) and video calls (3.65). Messenger communication is the least represented in official communication (1.86).

Table 3. Frequency of using digital communication tools.

	%					<i>M</i>
	1	2	3	4	5	
e-mail	0,0	1,6	6,6	20,0	71,3	4,61
written communication in a virtual teachers room	1,6	6,6	18,3	40	33,3	3,96
communication in Whatsapp or Viber groups	8,3	6,6	18,3	31,6	35,0	3,78
video calls	1,6	20,0	30,0	25,0	13,3	3,65
messenger	56,0	18,3	11,6	8,3	5,0	1,86

In average, principals, believe that their experience as principals influences the implementation of the school's digital transformation. Consent was assessed on a scale from 1 (not the least bit affected) to 5 (significantly affected). By analyzing the results seen in Figure 5. 57% of principals believe that their experience as principal affects the implementation of the school's digital transformation.

More than a third of principals (35%) believe that experience significantly affects the process of digital transformation of the school, and only 8% of principals gave average assessment. None of the principals believes that their experience does not affect the process of digital transformation of the school, what information construct *Experience*, along with *Knowledge*, *Skills* and *Abilities*, emphasizes as a significant factor in planning, managing and leading the digital transformation of schools.



Figure 5. The impact of principal's experience on the school's digital transformation process.

The most important competencies of principals in the process of digital transformation of the school were assessed by the principals by selecting five answers out of a possible nine. Competencies are divided into three groups - *Knowledge*, *Abilities* and *Skills*. The five most important competencies according to the principal's assessment are: digital literacy, ability to organize and lead teams, creativity and innovation, ability to communicate effectively and decision-making skills which are by over 70% of principals considered most important in the process of digital transformation of schools. Lower assessments principals gave to competencies, knowledge of digital tools, project management skills, persuasiveness and negotiation skills.

Table 4. The importance of principal competencies in the process of digital transformation of the school.

	<i>f</i>	%
Digital literacy	156	80,0
Knowledge of digital tools	84	43,3
Creativity and innovation	132	68,3
Ability to communicate effectively	132	68,3
Ability to organize and lead teams	138	71,7
Ability to persuade	50	26,7
Negotiation skills	41	21,7
Decision making skills	142	73,3
Project management skills	78	40

3.1 Discussion

The analysis of the results of the conducted empirical research provided an insight into individual competencies of primary school principals defined by the information constructs *Knowledge*, *Skills* and *Abilities* which influence the process of digital transformation of the school. The hypothesis that the knowledge, skills and abilities of principals significantly influence the digital transformation of schools has been confirmed. When asked, about the necessary competencies in the process of digital transformation of the school, principals gave high grades (over 80%) to competencies in the field of *Knowledge* (digital literacy, creativity and innovation), competencies in the field of *Abilities* (ability to communicate effectively, organize and lead teams) and *Skill* (decision making skills).

The frequency of use digital communication tools in everyday official communication shows the level of digital maturity in the field of school management where high marks from 3.65 to 4.61 assess the frequency of e-mail, communication in the virtual chamber, communication in Whatsapp and Viber groups and video calls. The level of digital literacy of principals is reflected in the results which show that 52% of principals have a ECDL Start diploma, and 27% of them an ECDL Advanced diploma, 91% of principals have been educated in digital literacy through seminars and courses, while 12% have formal education - graduated from the Faculty of STEM. At the same time, 98% of principals consider themselves digitally literate. This leads to conclusion that primary school principals are aware of need to improve their digital competencies as evidenced by participation in seminars and courses, thus strengthening the digital identity of the school they manage.

The weakest results of this research were obtained in the field of planning where only 15% of schools have a digital development plan as a separate document, and almost 40% of schools do not have a digital school development plan at all. Furthermore, the results show that principals in the majority (60%) are the only ones who manage the digitalization process, while in 22% of schools digitalization is managed by external decision-makers. In the field of digital transformation planning, it is necessary to give greater support to principals in the form of education, prescribe the obligation to adopt a digital development plan at the school level and provide state funding for potential professional support teams for schools in the field of digital transformation planning.

4 CONCLUSIONS

By introducing a new information construct *Experience*, it is possible to analyze the connection between the previously mentioned constructs. More than 90% of principals believe that their experience as principals influences and significantly influences their planning, management and leadership of the digital transformation of schools. In the Republic of Croatia, there is no legal obligation for education in the field of planning, management and administration of an educational institution prior to the taking of the position of principal. The years spent on a function of principal strengthen principals' competencies, improve knowledge, skills and abilities, which makes principals more prepared for the challenges required by the process of digital transformation of the school. Given the large number of principals with less than 10 years of principal experience (56%), which shows that there is often a change of principal in schools, there is a need for professionalization of the principal's position and their mandatory comprehensive education, which would guarantee possession of basic managerial competencies and knowledge of communication and digital tools for successful school management. This paper is starting point for further complementary research on a sample of high school principals, and relates to the specifics of planning, managing or leading the digital transformation of these schools.

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