

Digital management and digital leadership for the development of the digital educational environment of general secondary education institutions

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Abstract

The article is devoted to the issues of digital management in general secondary education institutions. The concept of digital leadership for the development of a digital educational environment as an important potential and tool for reforming the educational sector and modernizing the domestic digital educational space is considered. The vision of educators regarding current models and methods of developing leadership competence of teachers in the professional development system is presented. Its essence lies in the flexible combination of various components focused on the development of cognitive, operational-activity, and personal components of leadership competence. The main professional features of a modern digital leader are outlined, the main of which are strategic thinking, technological literacy, communication skills, security, adaptability, learning and development. The role of modern software and hardware complexes for the administration of general secondary education institutions, as well as digital tools for supporting management processes, communication, cooperation, creativity and innovation of the educational process at school is determined. The peculiarity of the study is taking into account international approaches to the development of professional qualities of teachers in the professional development system in the context of digital leadership in education, revealing the content of the characteristics of a digital leader and taking into account guidelines for improving professional skills. Conclusions and proposals for the implementation of digital leadership in education are presented, including strengthening the social component, communication, public relations, creating the school's image in social networks, involvement in professional networks, communication between teachers and experts and colleagues.

Keywords

pedagogical staff, digital leadership, education management, general secondary education institutions, professional development, digital environment of educational institution

1. Introduction

Digital management in education as an academic discipline is taught in many higher pedagogical educational institutions and institutions of postgraduate pedagogical education in Ukraine. The State Institution of Higher Education "University of Education Management" (hereinafter – the University) is a sectoral institution of higher education operating within the system of the National Academy of Educational Sciences of Ukraine. It conducts educational activities at the levels of higher education: first (bachelor's), second (master's), third (educational-scientific) and is a leading scientific and methodological center in the field of postgraduate education in Ukraine. Programs and courses of educational management are also taught in regional institutes/universities of postgraduate pedagogical education in Ukraine, domestic higher pedagogical educational institutions train specialists in the specialty "Management", implement courses "Management of an Educational Institution" and others.

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In modern conditions of digital transformation of education, managerial and leadership potential becomes one of the key conditions for the effective operation of an educational institution, and leadership becomes a tool for reforming the educational sector and modernizing the domestic digital educational space. In this context, leadership qualities are one of the main factors of self-organization and professional realization of pedagogical workers. Their identification and improvement is carried out through the development of leadership competence.

Issues related to the formation of leadership qualities today are inextricably linked with the use of technologies, the ability to manage processes and organize the learning environment. To create conditions for developing the leadership qualities of a modern teacher in the postgraduate education system, in addition to experience itself, an important role is played by what educational model will be applied and used during training. Thus, the main essence of such educational models lies in the combination of variable components, educational modules focused on the development of cognitive, operational-activity and personal components of leadership competence. The ratio of these components of leadership competence is determined according to the level of teacher leadership and prospects for its development at the stages of professional development in the inter-certification period. The issues of developing digital leadership and digital management have arisen today before Ukrainian education and before the entire educational community due to the fact that in recent years teachers have been directing their efforts to create a digital educational environment where students and all participants in the educational process can fully receive educational services. In recent years, schools have been forced to switch to distance learning mode. After the introduction of martial law in Ukraine, remote communication with students and parents has caused a number of challenges, where teachers and heads of institutions had to take responsibility for organizing and implementing distance learning. Digitalization has become both a trend in the world and an urgent necessity. The above-mentioned aspects have actualized the issue of developing leadership competence and digital leadership in modern conditions. The purpose of the article is to highlight the main components of digital leadership and digital management in education, especially in the context of strengthening the managerial component, communication, creating and maintaining the image of an educational institution and developing an educational digital environment.

Scientists consider digital leadership as a technological model of leadership that includes the effective use of technologies for the functioning of schools and achieving learning goals. Accordingly, to ensure these goals, attention is focused on the digitalization of the school environment and the transformation of the roles and responsibilities of school leaders and their effective performance of their digital roles [1, 2]. Munira Alajmi from Kuwait University, within the framework of her research, concluded that digital leadership in education fundamentally relies on modern digital tools and requires certain knowledge and skills from the leader for the effective use of these tools, which affects the improvement of student learning outcomes and affects the effectiveness of teachers' work [3]. Other scientists believe that digital leadership concerns not only competence and skills in one area, but also includes knowledge of other disciplines and arises as a result of combining management skills, administration and strategic thinking in addition to the ability to use digital tools for their activities [4, 5].

Issues of digital leadership in higher education institutions are also studied by Ghamrawi and Tamim [6]. Scientists consider the typology of digital leadership in higher education on the example of a large-scale mobile technology initiative. In particular, they emphasize the identification of the so-called 5D typology of digital leadership attributes, which includes digital competence, digital culture, digital differentiation, digital management and digital advocacy. Scientists discuss in detail how these attributes support the adaptive ability of a higher education institution to perceive digitalization [6]. Researchers also identify the main provisions of the theory and practice of digital leadership in education that are relevant to the international educational community [6]. Karakose et al. [7] examine teachers' perspectives on the digital leadership roles and technological capabilities of school principals during the COVID-19 pandemic. In particular, these scientists, based on the perception and experience of participants, identify such elements as the use of digital technologies, support for digital transformation, support for technology-based professional development, support for digital learning culture and digital leadership skills. Panshin et al. [8] provide a definition of the concept of a digital leader in education

and investigate the impact of digitalization on the formation of leadership qualities.

Based on the results of practical and theoretical studies of the problem of digital leadership, the main provisions, characteristics and indicators of this phenomenon are highlighted [9, 10]. Research by Kopytko et al. [11] is devoted to the problem of digital leadership in education. The researchers carried out a theoretical analysis of approaches to the interpretation of digital leadership and proposed a model of digital leadership of an organization, including an educational institution, which can be developed and refined according to aspects of educational specifics.

The problem of digital leadership in higher education and the formation of leadership qualities of future teachers in the context of continuous development of digital technologies and digitalization of the educational environment in higher education institutions is considered by Sapohov et al. [12].

2. Research methodology

The following methods were used for the research: analysis of scientific and scientific-methodological literature, review of existing programs and approaches to the development of digital leadership; study and analysis of foreign sources for comparison with domestic experience and familiarization with approaches to defining the concepts of digital leader and leadership; analysis of classifications and characteristics regarding the management of an educational institution and digital, software and hardware support for this process.

The authors also took into account the comparative approach to research of phenomena in the educational, information-digital environment of general secondary education institutions.

3. Research results

Today, the educational process can take place regardless of time and place, which requires quick and easy access to information and educational resources. The digital learning environment is a tool that expands the ways and possibilities of providing and receiving educational services, ensures the implementation of educational process activities in mixed and online formats, provides equal access to quality education for all participants in the educational process.

The development and use of the digital environment of a general secondary education institution, where learning, growth, education, communication, exchange of experience, leisure activities of participants in the educational process take place, is associated with a number of advantages for participants in the educational process.

All participants in the educational process (teachers, school heads, students, parents and other stakeholders and institutions) who gain access to shared data and information, to such forms of learning as distance, remote work, group work, use a significant arsenal of digital learning tools, which contributes to increasing the effectiveness of education. At the same time, a key condition for the effectiveness of the educational process is the organization of management of an educational institution. Therefore, leadership in education is an important and integral component of the management process, which allows improving the learning and education process.

The phenomenon of leadership today has developed in the digital world and has emerged as a direction – *digital leadership*. The understanding of digital leadership is based on the general principles of leadership theories, among which the main ones are situational, functional, behavioral, and integral theories. The problem of leadership in education is considered by foreign and domestic scientists and practitioners of education as a complex concept, namely: as a phenomenon, a form of educational practice, as a socio-psychological process, as a personality characteristic, etc.

Modern education, like all other public sectors, needs a completely new type of leader – a *digital leader*. After all, a teacher must navigate modern trends in the application of digital technologies and be an active participant in creating the digital environment of an educational institution, having a high level of digital competence and the need for its further development, create teams, maintain connections between participants in the educational process, cooperate and establish connections with stakeholders,

actively involve them and work together to achieve a common goal, overcome communication barriers, competently communicate when performing professional tasks, be able to self-present, as well as develop a culture of innovation, ethics, competitiveness, risk resistance and constantly self-improve and develop.

As noted by Panshin et al. [8], digital leaders differ from non-leaders in various skills, attitudes, knowledge, as well as professional and personal experience. Digital leaders must be flexible, able to adapt and strive for intellectual curiosity and new knowledge. They should be open to continuous learning, seeking solutions globally, and should constantly encourage their employees and followers to learn [8].

Taking into account the above definitions of digital leadership and digital leader, it is worth exploring certain characteristics of such leaders, as presented in the works of researchers, and determining how it is necessary to support this direction in education. It is also important to realize the role of technologies and the level of digitalization of educational institutions that contribute to creating conditions for digital leadership.

To understand how teachers demonstrate their leadership, it is necessary to use tools for monitoring their leadership competencies, particularly when they take professional development courses. Monitoring the quality of educational services during professional development is a complex task today, as there are no reference indicators of the quality of such services, including for determining provisions related to the digital leadership of the head of an educational institution, teacher and pedagogical worker. Despite existing professional standards, it is very difficult to assess leadership. That is why, to stimulate the development of leadership qualities of professionals in education, it is worth creating models of professional development in accordance with the requests of individuals and educational institutions. Sapohov et al. [12] identified the main professional competencies and skills of a modern digital leader, the main components of which are strategic thinking, technological literacy, communication skills, security, adaptability, learning and development.

For example, the team of the Bila Tserkva Institute of Continuing Education developed and implemented the software complex “School of Leaders of Professional Education as an Innovative Model of Teacher Training in Conditions of Sustainable Development”. The software complex is based on a new model of training educational leaders and managers according to their requests [13]. Scientists provided a vision, a model for the director of professional training, which the team started. Key elements are supporting the competent development of education workers at all stages of their education and professional trajectory. This model includes the development of profiles of the main skills of teachers that are developed in advanced training systems: integrated abilities, general abilities (education, regulation), special abilities (andragogical, scientific-methodological, research, civic, competence in informal education and professional-personal development; psychological-facilitative; entrepreneurial digital, etc.). Thus, a modern leader is characterized as a person who: thinks globally, foresees potential, formulates a general vision of the future; approves changes, demonstrates awareness of the latest technologies, encourages constructive criticism, achieves success in competition; promotes the development of people’s abilities, delegates authority, values sincerity in people; shows readiness for joint management, develops teamwork, a sense of partnership, cares about people’s satisfaction; demonstrates personal achievements, a high level of competence, acts flexibly, in accordance with the requirements of the situation and proclaimed values and mission.

The head of an educational institution, as a leader, must have the following skills and abilities: ability to manage oneself and one’s time; civic and socially important personal values; strategic vision; personal responsibility; striving for constant self-improvement; problem-solving skills; creativity and ability to innovate; knowledge of modern methods of influence; ability to influence others, convince them; ability to teach and develop subordinates; ability to form and develop effective teams.

To solve tasks and ensure the educational process, the head of an educational institution, in particular a general secondary education institution, uses electronic software and hardware complexes, which include, for example, the Software and Hardware Complex “Automated Information Complex of Educational Management” (PAC “AIKOM”). This is an EMIS class system (Education Management Information System, electronic education management system), designed for processing state elec-

tronic information resources and personal data in the field of education within a single integrated environment. The main task of such a complex is to ensure the transition to electronic document flow (reporting, communication, notifications, surveys, voting, operational data collection) and optimization of business processes in the field of preschool, general secondary, extracurricular and professional (vocational-technical) education, as well as education management at local and regional levels (creation of appropriate modules in PAC “AIKOM”) [14]. Such a complex allows to significantly improve the reliability of educational statistical and management information and improve on this basis the quality of management decisions, in particular regarding the distribution of educational subvention funds and other budget money for education, creates prerequisites for abandoning paper documents within the framework of general debureaucratization, etc. At the same time, the administration of the institution has the opportunity to quickly prepare educational reports, charts of success by classes and subjects; analyze the effectiveness of teachers’ work; keep records of attendance; track the dynamics of success of students, classes, schools; increase the rating of the educational institution.

For teachers, the use of software and hardware complexes helps to get rid of unnecessary paperwork; provides easy access to the current schedule on a smartphone or computer; allows downloading educational materials for study and assistance in preparing homework; saves time on lesson preparation; allows convenient division of classes into groups without paper journals; performs simple automatic formation of complex reports based on the results of the semester or academic year; establishes effective communication with students and parents.

For students, AIKOM as a service provides: convenient access to educational materials and homework; participation in online webinars and conferences organized by the school; viewing lesson materials at a convenient time (in particular, during absence from school) and the possibility of remote interaction with teachers; conditions for independent control of learning success. At the same time, parents can quickly learn about children’s success and attendance; effectively control acquired knowledge and homework completion; interact and communicate with teachers, as well as participate in assessing the quality of educational services, including digital ones.

There are a number of digital tools that are effective for supporting management processes, communication, cooperation, creativity and innovation, including Lean Canvas, StudDiary, Google Classroom, distance learning systems - Moodle, ATutor, Claroline, Dokeos, LAMS, OLAT and others.

Ghamrawi and Tamim [6] consider the characteristics of digital leadership in higher education institutions to be a combination of five components, namely:

- digital competence,
- digital culture,
- digital differentiation,
- digital management,
- digital advocacy.

The “5D Typology for Digital Leadership” approach [6], the elements of which were identified during a survey within the framework of the conducted research, will be effective for implementation in the university management system and will contribute to its development in the context of modern processes of digital transformation [6].

Regarding school education, according to Zhong [15], strategies for digital leadership in secondary education institutions should be:

- Visionary Leadership,
- Digital Age Learning Culture,
- Professional Development,
- Systemic Improvement,
- Digital Citizenship.

Kopytko et al. [11] proposed a model of digital leadership of an organization, in particular an educational institution, which can be developed and refined in aspects of educational specifics (figure 1).

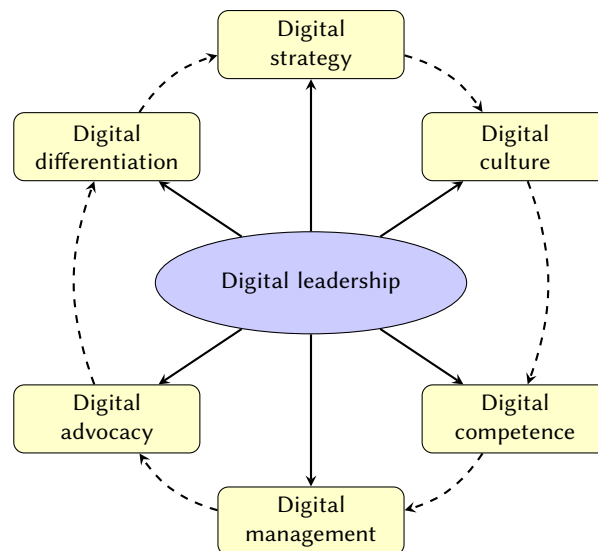


Figure 1: Model of digital leadership (based on Kopytko et al. [11]).

Researcher and practitioner, former principal of New Milford High School, USA, Eric Sheninger, who is a specialist in digital technologies in education and an expert on digital leadership in education, believes that digital leadership begins with identifying obstacles to making changes and making specific decisions to overcome them in order to prepare the school for the challenges of the digital age [16]. The scientist identified seven directions of digital leadership – seven pillars of digital leadership in education, the content of which contains certain guidelines for digital leaders and the development of digital leadership, which we will consider in more detail:

1. *Communication.* Digital leadership is about engaging all stakeholders in communication. Important information can be transmitted using various digital tools, including free ones, social networks and simple implementation strategies to satisfy stakeholders in the digital age.
2. *Public relations.* Forming the foundation of a public relations platform, using free social media tools with the ability to control content. Digital leaders should become the main narrators of educational policy and events of the educational institution, form a positive image of the educational institution based on best practices and achievements, create the necessary level of transparency in an era of negative rhetoric regarding education.
3. *Branding.* The branding of any organization plays an important role in its impact on current and potential consumers. Digital leaders can use digital technologies to create a positive brand presence that emphasizes positive aspects of school culture, demonstrates the reputation of the educational institution, increases community pride and helps attract parents and the public.
4. *Student engagement.* School education should reflect real life. Digital leaders must understand that students should use the digital tools they use outside of school, create learning artifacts that demonstrate conceptual mastery. This is an important pedagogical shift as it focuses on improving core skill sets, namely: communication, collaboration, creativity, media literacy, global connectivity, critical thinking and problem solving that society requires. With a sound pedagogical foundation, digital tools and social networks provide students with the opportunity to take more responsibility for their learning.
5. *Professional growth and development.* Being at the forefront of digital technologies in education, keeping up with the times and implementing the achievements of science and technology in the educational process is possible thanks to professional growth and development. Using the capabilities of social networks provides the opportunity for support and feedback. Leaders can form their own personal learning network (PLN) for their own learning needs, resources, connections with experts in the field of education, with practitioners, as well as for discussing issues to improve teaching, learning and leadership.

6. *Reimagining the learning environment.* This direction of implementing digital leadership should be implemented after digital leaders understand the foundations laid in previous directions, understand how to use them to initiate sustainable changes. The next step is to begin the digital transformation of the learning space and environment. Digital leaders must begin to create or develop a vision and strategic plan dedicated to learning in the digital world. To do this, digital leaders must know the characteristics and dynamics of development and innovation of digital learning environments, such as Bring Your Own Device (BYOD), blended learning, flipped classroom, gamification, virtual learning and others.
7. *Opportunities.* It is important for digital leaders to consistently look for ways to improve existing programs, resources and professional development. Digital leaders use connections, increase opportunities for improvement in various areas of school culture. They must be catalysts for change and must transform their schools into ones that prepare students to master the necessary skills of the digital age while engaging various stakeholders.

The approach to implementing digital leadership in education proposed by Sheninger [16] can be called socially-oriented, focused on the social component, in particular, communication, public relations, creating the school's image in social networks, involvement in professional networks, communication with experts and colleagues.

4. Conclusions and prospects for further research

Thus, the general strategies for implementing digital leadership are understanding digital transformation and its impacts, involving all participants in the educational process in digitalization processes, communication and public relations, creating a policy of a general secondary education institution regarding the use of digital technologies, developing the digital educational environment of an educational institution and its infrastructure, professional improvement and development, digital management. It is also worth paying attention to digital advocacy and digital citizenship – aspects non-traditional for school education. When considering the problem of digital leadership, it is necessary to separately focus on such an important aspect as digital ethics. Undoubtedly, digital leadership in education must be ethical, follow social norms of behavior in the digital world and professional ethics of the educational sector in the context of digitalization, based on the principles of integrity, respect, benevolence, compliance with subordination, respect for personal boundaries, psychological comfort, resource savings, traditionalism and principles of confidentiality and security. Consideration of the problems of digital leadership in education and the digital leader is an object for further research.

We believe that it is important to expand prospects for teachers in improving professional skills, in particular – determining specific topics for possible professional development courses: academic integrity, protection of personal data, virtual laboratories, stress resistance and others. Now, in wartime conditions, it is important to conduct current analysis and regular monitoring of the current state of technical and scientific-methodological equipment of schools, to focus attention personally on teachers regarding their ability to implement distance learning with students. Attention should be paid to those teachers and pedagogical workers who conduct distance learning for internally displaced children and refugee children, as well as to those teachers who implement distance learning for children from occupied territories.

Among future research directions, it is also important to focus on the impact of the digital educational space on the success of schoolchildren; creating tools and methods for supporting online learning in various academic disciplines; identifying problems and developing innovative, effective scientifically based online tools and providing scientific and methodological support; developing new digital platforms and educational environments with accessible and free online materials for teachers of all subjects.

Declaration on Generative AI

The authors have not employed any generative AI tools.

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