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Networking in a virtual environment

Abstract
Networking, as a relatively new learning and professional development strategy, involves connecting people, groups, and/or organisations for the faster exchange of information, knowledge, and experiences, as well as joint learning, research, and the generation of ideas.
Although the beginnings of the scientific approach to networking can be linked to psychological research into group dynamics, the development of information and communication technologies may have contributed the most to the concept of networking. Networking in a virtual environment, although with limitations of social interactions, facilitates communication and provides space for (international) cooperation and enables intercultural connection.
The concept of networking advocates social equality, which in practice is determined by the social competencies and professional status of individuals and/or groups. One of the characteristics is better visibility of individuals and/or groups and promotion of certain ideas and information. At the same time, it also brings the risk of insufficiently reliable information and the possibility of "hiding behind" joint decisions.
Following relevant research, it is possible to assume a high level of networking, including virtual/digital, of individuals within the framework of formal education and professional development. However, this does not exhaust the possibilities of networking in education.

Keywords: *information exchange, discussion, learning strategies, e-learning*

Introduction

Networking can be interpreted as a process of connecting people, groups and/or institutions to exchange information, knowledge and experiences as well as learn, research and generate new ideas (Visković, 2024). Most often, individuals, groups and/or organizations with similar interests and worldviews network. They join networks voluntarily and have their unique roles (Piaoi Ma, 2018). Networking can be interpreted as social constructivism because the exchange of information and discussion lead to the redefinition of existing knowledge and the generation of innovative

solutions, so networking can be viewed as social constructivism(Dunaway, 2011;Siemens, 2005). Based on different perspectives, experiences and resources, a new intellectual value is constructed that enables a kind of "look ahead" (Marciano et al., 2020).

The importance and possibility of social networking was researched by Moreno, the creator of sociometryin 1956. By analysing group dynamics, he pointed out the importance of social connection. The development of digital media has enabled networking in a virtual environment. Living and educational conditions during the COVID-19 pandemic have intensified networking and learning in a virtual environment. It is possible that it was networking in a virtual environment that made it possible to continue formal education (Calderón-Garrido & Gil-Fernández, 2022; Visković, 2021). Some authors like Downes (2020), question the continuation of such a trend in the post-pandemic era and consider it unjustified. Pando (2018) criticizes virtual networking as socially incomplete and value-questionable, even though it has become a common way of accessing information. However, Eatough (2021) believes that, regardless of technological possibilities, networking still most often takes place in a physical environment.

Regardless of the methods and reasons for networking, a larger number of authors emphasise networking as a "strategy of the future" (Alman, Frey & Tomer, 2012; Bass, 2020; Corbett & Spinello, 2020; Marciano et al., 2020; Vollenbroek, de Vries & van Dijk, 2021). Moreover, Gqwabaza and Maqoqa (2024) believe that networking encourages intercultural and international cooperation and a sense of shared responsibility.

Networking in education

The quality of education, including all forms of formal, non-formal and informal education, is a predictor of the development of the individual and society as a whole. Michnick Golinkoff and Hirsh-Pasek (2016) highlight collaboration, communication, critical thinking, creativity and self-reliance as fundamental features of modern education.

The European Commission (2023) advocates the creation of diverse learning environments, including networking, and the development of the necessary competences to function in such environments. In European strategic documents (e.g., *Strategic framework for European cooperation in education and training towards the European education area and beyond,* 2021; *Council Resolution on the governance structure of the strategic framework for European cooperation in education and training towards the European Education Area and Beyond 2021-2030*) the importance of developing

digital and social competencies and learning competencies is highlighted. All learning strategies that can contribute to the quality of learning, faster exchange of knowledge and the generation of new ideas are promoted (Best & Kahn, 2006; Welsh, 2021). Moreover, learning is advocated as a joint constructive process subject to critical analysis (Gqwabaza & Maqoqa, 2024).

Networking in education is a relatively new learning strategy. It is based on the belief that information is "stored in online friends" (Siemens, 2005). The purpose of networking is not only the exchange of information but purposeful change (Anderson & Dron, 2011). Therefore, within the network, discussion is encouraged as a model for critical consideration of learning content and generation of new ideas. Individuals and/or groups that are networked, thanks to the faster exchange of information, gain insight into different paradigms, engage in discussion more quickly, and thus more easily promote personal and group potential. Baumgartner (2019) also highlights the transformational potential of learning in a network environment, the development of discourse with the aim of broadening perspectives through issues of interest to the group, and the creation of different solutions as optimally agreed strategies.

The concept of networking is increasingly present in higher education. Some research points to the existing high level of networking of the majority of individuals during their formal education (Gqwabaza & Maqoqa, 2024; Visković, Marušić & Topić, 2024; Visković, Šimić & Marušić, 2022).

Education is increasingly taking place in informal settings as well (Kagan, 2024). Predictors are high individual engagement, critical review of information, and analysis of personal learning (Miljković, Đuranović& Vidić, 2019). Learning in an informal environment can empower individuals and contribute to their professional development and further professional networking. That is why many higher education institutions initiate alumni and student-practitioner networking (Kagan, 2024). Cranton (2016) highlights the potential of peer-to-peer networking of students through project (smaller) groups. Such groups have a stronger focus on the goal, a higher tolerance threshold, better communication and mutual support. At the same time, they have a higher level of resilience due to the joint distribution of tasks and responsibilities (Cranton, 2016).

Networking as a learning and professional development strategy

Learning is the process of acquiring new knowledge, skills and habits. It results in new experiences and relatively permanent changes in behaviour. Learning strategies are ways of managing learning. They are based

on knowledge of resources and (personal) abilities and knowledge of the purpose and usability of new knowledge (Miljkovićet al., 2019).

Carvalho (2023) describes contemporary education as a concept of a new learning strategy that connects digital and technological knowledge, the use of new technologies and social competences. Bonfield, Salter, Longmuir, Benson and Adachi (2020), analysing individual networked educational communities, e.g., My Skills Future (Australia) and Deakin's Smart Campus (Singapore), as common dimensions, they single out the development of competencies closely related to the jobs of the future and commitment to lifelong learning.One of the predictors of that process is building a specific relationship of mutual trust and support (Corbett & Spinello, 2020).

Networking as a learning strategy assumes a developmental process. It combines metacognition and critical reflection on online information, knowledge of resources (all networked members), and the concept of purpose. It focuses on social learning and advocates a democratic participatory approach. Trust, Krutka, and Carpenter (2016) believe that learning in an online environment contributes to student learning and the development of teacher competencies.

Anders (2018) believes that, within formal education, individuals network at three levels:

- development of personal learning networks (peers and various other individuals),
- learning communities based on a common area of interest,
- experiential networking with professionals (other practitioners, collaborators, scholars). These levels of networking correlate significantly with professional development activities (Anders, 2018).

Gqwabaza and Maqoqa (2024) believe that networking, primarily through digital technologies, enables collaboration across institutional boundaries. They primarily network to exchange information and use databases. However, networking also provides them with insight into different perspectives and cultures.

Networking is one of the professional development strategies. It often assumes involvement in professional groups, connecting and expanding the network of fellow experts. Along with the faster exchange of information, it enables greater visibility of the individual and, indirectly, greater mobility on the labour market (Kagan, 2024). Trust et al. (2016) emphasize the contribution of professional networking to affirmative practice changes and the results/outcomes of that practice.

Pascal and Bertman (2012) advocate a praxeological approach to transformational learning by connecting and verifying theoretical knowl-

edge with practice. The praxeological approach is part of "action-oriented" pedagogical concepts that promote the questioning of theory through the development of practice (UNESCO, 2018). Discussion, analysis, action and reflection are components of such an approach. This can encourage collaborative relationships and contribute to the development of (self)criticism and responsibility (Scager et al., 2016). The development of "learning communities" begins in part with the building of collaborative relationships in the process of questioning (personal) practice (Arruti & Panos-Castro, 2020). Such communities can generate general (social) models and/or solutions, which are adapted in practice to the culture of the individual community (Visković, Marušić & Višnjić Jevtić, 2022). Learning through networking is used in the development of professional competencies in different fields (education, management). It enables the establishment and development of relationships within and outside the network of a certain professional community, especially among educational institutions (Soleymani, Laat, Itard, & Specht, 2022). Professional networking represents a platform for learning, helps solve everyday challenges and encourages innovative development of competencies with equal participation of its members (De Laat, 2012).

Miljković et al. (2019) interpret practitioner networking as an opportunity to utilize various sources and actively learn, to seek and use help, and, if necessary, leadership. Networking as a professional development strategy enables both the generation of innovations and their practical application, e.g., the *Living Labs* concept (Lacroix et al., 2017). The networking strategy connects the research sector (universities, institutes), manufacturers and users, and tests innovations that respond to the needs of users. In this way, the developed innovations are brought closer to the real needs and requirements of users, and enable learning in practice. Adopting this strategy in initial formal education encourages the training of individuals to constructively solve real problem situations and the development of functional knowledge and skills (Arnold & Mundy, 2020).

Various professional gatherings (conferences, presentations) are suitable for initial introductions and networking of professionals, individuals and organisations (Kagan, 2024). With greater visibility, they can contribute to professional promotion and individual achievements (Anders, 2018). De Laat (2012) and Zhu and Chen (2022) believe that this is also recognizable in the professional development of educators (early and preschool teachers, primary school teachers, etc.).

Initial networking usually begins with professionally similar individuals (Kagan, 2024). In the initial stage of networking, most practitioners are usually "observers and listeners" (Zhu & Chen, 2022). This can be at-

tributed to insufficient social competencies and an underdeveloped professional identity. By being involved in this process, individuals gradually adjust their paradigms and recognize their potential, as well as the benefits of networking. Checking information and ideas from the network can contribute to the development of professional competences, and indirectly to the development of self-confidence. The self-perception of personal role and competences in practice enables them to be actively included in the network through the presentation of personal practice (Civís, Diaz-Gibson, López, & Moolenaar, 2019). This can also contribute to building a group professional identity. Heled and Davidovitch (2021) emphasise that without the initial construction of group identity, there is no possibility for optimal development of personal professional identity.

The construction of a professional identity is also recognised in heterogeneous groups, e.g., practitioners and students studying for the specific profession (Willegems, Consuegra, Struyven& Engels, 2018). Certain studies indicate networking of early and preschool education students and in-service preschool teachers has positive effects (Visković et al, 2024; Sunko& Marušić; 2022; Višnjić Jevtić & Rogulj, 2022; Visković, 2021). Networking in this process contributes to the professional identity of practitioners (who strengthen mentoring competencies) and students (who learn to integrate theoretical knowledge into practice). Steenekamp, van der Merwe and Salieva Mehmedova (2018) emphasise that the experience of early practical learning and acquisition of functional knowledge positively correlates with building the professional identity of early and preschool teachers and teaching staff in general. This is confirmed by research by Sunko and Marušić (2022), which indicates that ECEC students recognise networking with practitioners as a predictor of personal professional development. These views are more supported by students in their senior years of study (Visković et al., 2024).

Gross (2014) emphasises the importance of creating personal learning networks (PLN). PLN enables "learning in a collaborative environment, the possibility of sharing your problems with others, getting answers and moral support from colleagues, and showing your examples of experience and achievements" (Gross, 2014: 141). Oddone, Hughes and Lupton (2019) investigated the importance of autonomy within the professional learning networks of educators (preschool teachers, teachers, professors). They asserted that teachers perceive autonomy through networking as connecting (choice and control), comprehensive (self-expression as a teacher and student) and self-affirming (self-expression as a professional person). This correlates with the research of Kastberg, Buchko and Buchko (2020), who believe that networking with a wide range of people contributes to the de-

velopment of socio-emotional competencies. At the same time, some research points to the connection of network structure with the feeling of developing self-efficacy, and consequently with the development of professional identity (Anders, 2018).

Unfortunately, indiscriminate access to networks, for example by students, carries the risk of accepting unverified information and building (negative) attitudes based on other people's (negative) experiences. That is why Vrasidas (2000) warns of the ever-present risk of leaving the freedom of choice of learning sources to students. Olayinka (2016) attributes this to the inadequacy and/or unavailability of diverse quality learning sources. UNESCO (2020) also warns of the risk of using inadequate learning sources and promoting scientifically unfounded content, outside the objectivist paradigm.

Network structure

In the field of education, individuals, groups and institutions (most often) network for professional interest (e.g., research), greater visibility and promotion. Individuals, groups and institutions of the same or different professional level (e.g., scientists and/or practitioners) in specific areas of interest (e.g., early childhood education) can network. Networking most often occurs through individuals who already know each other professionally (Visković et al., 2022). The structure of the network can be homogeneous (e.g., only practitioners), heterogeneous (e.g., scientists and practitioners) or multi-heterogeneous (e.g., scientists, practitioners and students). Mutual respect, trust and focus are greater in homogeneous groups. At the same time, research shows that heterogeneous groups can achieve better outcomes due to insight into different perspectives and experiences (Amos & Pearse, 2008). Heterogeneous groups can contribute to a holistic perspective and offer a kind of "looking ahead" (Caraballo, Lozenski, Lyiscott, & Morrell, 2017; Sunko & Marušić, 2022). Some public education policies (EU Commission 2021; OECD, 2021; UNESCO, 2020) advocate the heterogeneity of networked members as an opportunity to verify scientific knowledge in practice, to question pedagogical paradigms, and to continuously verify scientifically based knowledge through the development of practice.

Involvement in the network is generally voluntary, and the concept of networking advocates social equality (Caraballo et al., 2017). Nevertheless, networked groups can have a focally centralized structure or a polycentric network. With a focal structure, the central position is usually held by an individual or group with the greatest (professional) influence. In polycen-

tric networking, all members are equal and have the possibility to propose and make decisions (Vollenbroek et al., 2021).

Bergvall-Kåreborn, Ihlström Eriksson, & Ståhlbröst (2015) believe that network structure requires the definition of norms and patterns of behaviour and practices that create a "sense of place". These "places" are not necessarily tied to a geographic location, but can be physical or virtual. Places that integrate the global and local world and transcend spatial and temporal limitations are advocated.

Interest in networking is often driven by personal needs, such as faster access to information, the generation of ideas to solve problems, and the promotion of personal ideas. It is reasonable to conclude that individuals who recognise personal benefits approach networking. Conversely, a lack of perceived personal benefit can also lead to network erosion.

Networking can also be occasional (as needed), temporary (for a preagreed time), and permanent. In the long term, individual networks evolve into strong collaborative relationships, or they extinguish due to a lack of need or common interest. Although networking implies a relatively flexible structure, excessive flexibility and the absence of rules contribute to faster network erosion.

The durability and effectiveness of a network are also related to the quality of relationships and behaviours of its members, as well as the positions of individuals (Steinfield et al., 2008). Rigidly structured networks, which lack adequate connections and trust, promote polarisation of members' positions. Individuals in "central" positions assess personal and collective capabilities and achievements more significantly (Vollenbroek et al., 2021).

Advantages and disadvantages of networking

Networking, like most social phenomena, has advantages and benefits, as well as risks and disadvantages. They can be interpreted in terms of networking methods, relationships, and expectations of network members (Visković et al., 2024).

The advantages of learning through networking are multiple. Purposefully organised networking can contribute to the quality of learning (Sunko & Marušić, 2022; Visković et al., 2024; Vollenbroek et al., 2021). Networking with peers and/or scientists can contribute to professional development and provide peer support. An environment in which an individual feels safe can contribute to the development of critical thinking and the empowerment of the individual and the professional community (Manches &

Plowman, 2017; McPake et al., 2013). A predictor of such benefits is mutual trust, which at the same time carries the risk of unreliable information and/or misunderstanding (Steinfield et al., 2008).

Social interactions between network members enable the recognition of individual abilities and capabilities (Marciano et al., 2020). Network members become more visible and accessible, which facilitates the dissemination and/or popularisation of individual opinions (Visković et al., 2024). At the same time, joint decision-making on the network can result in the anonymity of members. The effect/outcome is related to the quality of relationships between members and their competencies.

Santiago et al. (2021) highlight the management of group dynamics as a difficulty. In virtual networking, insufficient digital competencies of individuals, technical problems and difficulty in navigating a technologically specific socialisation context are observed (Nijland et al., 2023). Santiago et al. (2021) recognise the lack of face-to-face interaction as a difficulty, which also hinders the functional application of new knowledge. Therefore, Nijaland et al. (2023) suggest early academic socialisation that connects scientists, practitioners and students.

Valantinaitė and Sederevičiūtė-Pačiauskienė (2021) problematise the level of participants' competences in recognising the relevance of information obtained online. Their research leads to the conclusion that not all network participants have the same competencies in noticing key elements and critically reviewing information. At the same time, social interactions of network members are not necessarily affirmative.

Analysing the advantages and disadvantages of professional networking, Kagan (2024) advocates avoiding "rush". Before joining a particular professional network, Kagan (2024) advises an analysis of the network, the opportunities it provides concerning personal potential, motivation and purpose. At the same time, he does not recommend joining a large number of networks, as this can limit the engagement of an individual.

Table 1. *An overview of the recognisable advantages and disadvantages of networking*

Advantages	Potential disadvantages
Discussion (as a learning model), development of critical thinking	High reliance on others
Mutual trust	The risk of accepting unreliable information and/or misunderstanding
Involvement of different individuals	Indiscriminate inclusion in the network

Visibility and accessibility of the individual	"Hiding" behind shared decisions - high visibility that makes the individual vulnerable
Insight into new information, knowledge	Social dynamics ("serving" or resistance to authorities)
Dissemination and popularisation of certain opinions and attitudes	
Understanding theory in practice, research	Learning from only one perspective, without experience and/or verification of scientific (theoretical or research) knowledge
Connecting theory and practice	Glorifying only one paradigm

Note: according to: Visković, Marušić & Topić, 2024

As a predictor of the quality of networking that each member can recognise as a personal benefit, Alman et al. (2012) highlight:

- A common system of goals with a clear definition of desired outcomes and expectations,
- Focus on strengths (what an individual/group can contribute to the network),
- Network structure (equal or different competences of stakeholders, working methods depending on the purpose of networking)
- A culture of trust and constructive communication.

Unfortunately, the concept of networking does not yet have a developed code of ethics. At the same time, the networking of practitioners and scientists in early and preschool education of children/minors is subject to ethical principles regulated by the legal legislation of each country, for example, the *Code of Ethics for Research with Children* (Croatia, 2020).

Conclusion

Networking is reasonable to accept as one of the strategies for the current and future development of individuals and society. Advocating the development of a "knowledge society" and the flow of information promotes networking as a way of learning. It can be interpreted as a network of "common ground" (interests) and (social) connections. The development of digital technologies expands the possibilities of networking in the virtual world and contributes to the building of specific social relationships.

The benefit of networking, especially in education and the educational process is a recognisable strategy of active learning. In all forms, it provides insight into new knowledge, but also its critical and constructive analysis. It advocates the responsibility of the individual who chooses online commu-

nities and learning content. Unlike other learning strategies, networking emphasises the individual as the starting point of learning and connecting as a benefit for all stakeholders in the process.

Social processes, including networking, are often nonlinear, so the outcomes are difficult to predict. Networking, as a social learning strategy, along with a number of advantages, also brings risks. Although the development of digital technologies expands the possibilities of networking, it also increases the risks. This suggests need for systematic research into virtual, but also all other forms of networking.

Literature

Anders, A. (2018). Networked learning with professionals boosts students' self-efficacy for social networking and professional development. *Computers & Education*. 127. https://doi.org/10.1016/j.compedu.2018.08.009

Alman, S. W., Frey, B. A., & Tomer, C. (2012). Social and cognitive presence as factors in learning and student retention: An investigation of the cohort model in an Schoolsetting. *Journal of Education for library and Information Science*, 290-302.

Anderson, T., & Dron, J. (2011). Three generations of distance education pedagogy. *International Review of Research in Open and Distributed Learning*, *12*(3), 80-97.https://doi.org/10.19173/irrodl.v12i3.890

Arnold, J., &Mundy, B. (2020). Praxis pedagogy in teacher education. *Smart Learning Environments*, *7*(1), 1-14.https://doi.org/10.1186/s40561-020-0116-z

Arruti, A., & Panos-Castro, J. (2020). International entrepreneurship education for pre-service teachers: a longitudinal study. *Education+ Training, 62*(7-8), 825-841. https://doi.org/10.1108/ET-04-2020-0098

Baumgartner, L. (2019). Fostering Transformative Learning in Educational Settings. *Adult Literacy Education: The International Journal of Literacy, Language, and Numeracy*, *1*(1), 69-74. https://doi.org/10.35847/LBaumgartner.1.1.69

Best, J.W., & Kahn, J.V. (2006). *Research in Education* (10th Edition). Pearson Education Inc.https://www.academia.edu/5382594/Research_in_Education_Tenth_Edition_

Bergvall-Kåreborn, B., Ihlström Eriksson, C., & Ståhlbröst, A. (2015). Places and spaces within living labs. *Technology Innovation Management Review*. *5* (12): 37–47. doi:10.22215/timreview/951

Bonfield, C. A., Salter, M., Longmuir, A., Benson, M., & Adachi, C. (2020), Transformation or evolution?. Education 4.0, teaching and learning in the digital age, *Higher Education Pedagogies*, *5* (1), 223–246. https://doi.org/10.1080/23752696.2020.1816847

Carvalho, L. (2023, February 22). *Innovation and Tehnology: Education 5.0: What Does It Mean? How Does It Work?* Sydle. https://www.sydle.com/blog/education-5-0-61e71a99edf3b9259714e25a

De Laat, M. (2012). *Enabling professional development networks: How connected are you*? Open Universiteit. https://avs.nl/sites/default/files/documenten/artikelen/12014/De%20Laat%20-%20Enabling%20professional%20development%20networks.pdf

Calderón-Garrido, D., & Gil-Fernández, R. (2022). Pre-service Teachers' Use of General Social Networking Sites Linked to Current Scenarios: Nature and Characteristics. *Technology, Knowledge and Learning*, 1-25.https://doi.org/10.1007/s10758-022-09609-7

Caraballo, L., Lozenski, B. D., Lyiscott, J. J., & Morrell, E. (2017). YPAR and critical epistemologies: Rethinking education research. *Review of Research in Education*, *41*(1), 311-336.https://doi.org/10.3102/0091732X16686948

Civís, M., Diaz-Gibson, J., López, S., & Moolenaar, N. (2019). Collaborative and innovative climates in pre-service teacher programs: The role of social capital. *International Journal of Educational* Research, 98, 224-236. https://doi.org/10.1016/j.ijer.2019.08.019

Cranton, P. (2016). Understanding and PromotingTransformativeLearning: A Guide to Theory and Practice (3rd ed.). Routledge.https://doi.org/10.4324/9781003448433

Corbett, F., & Spinello, E. (2020). Connectivism and leadership: harnessing a learning theory for the digital age to redefine leadership in the twenty-first century. *Heliyon*, *6*(1), e03250.https://doi.org/10.1016/j.heliyon.2020.e03250

Downes, S. (2020). Recent Work in Connectivism. *European Journal of Open, Distance and E-Learning*, *22*(2), 113-132.https://doi.org/10.2478/eurodl-2019-0014

Dunaway, M. K. (2011). Connectivism: Learning theory and pedagogical practice for networked information landscapes. *Reference Services Review*, *39*(4), 675-685. https://doi.org/10.1108/00907321111186686

Eatough, E. (2021). What is networking and why is important. Better Up. https://www.betterup.com/blog/networking

European Commission (2023). *Strategic framework for European cooperation in education and training towards the European education area and beyond*. https://eur-lex.europa.eu/EN/legal-content/summary/strategic-framework-for-european-cooperation-in-education-and-training-towards-the-european-education-area-and-beyond.html

European Commission (2015). *Council conclusions on entrepreneurship in education and training* (2015/C 17/02).https://eur-lex.europa.eu/legalcontent/EN/TXT/HTML/?uri=CELEX:52015XG0120(01)&from=PT

European Commission (2021). Directorate-General for Education, Youth, Sport and Culture, *Early childhood education and care: how to recruit, train and motivate well-qualified staff: final report*. Publications Office. https://data.europa.eu/doi/10.2766/489043

European Commission (2021). *Council Resolution on a strategic framework for European cooperation in education and training towards the European Education Area and beyond* (2021-2030) (2021/C 66/01).https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32021G0226(01)&rid=5

European Commission (2022). *Communication from the commission to the European parliament, the Council, the European economic and Social committee and the committee of the Regions on a European strategy for universities* {SWD(2022) 6 final}. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2022:16:FIN

European Union (2021).*Council Resolution on the governance structure of the strategic framework for European cooperation in education and training towards the European Education Area and beyond (2021-2030)*. 2021/C 497/01. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32021G1210%2801%29

Gross, J, (2014), 8 - Networking for your LIS career. In Julia Gross (Ed.) Chandos Information Professional Series, *Building Your Library Career with Web 2.0,* Chandos Publishing, pp.141-158.https://doi.org/10.1016/B978-1-84334-651-7.50008-X

Gqwabaza, N. & Maqoqa, T. (2024). "The Role of Collaboration and Networking in the Digital Age: Students' Perspectives," *E-Journal of Humanities, Arts and Social Sciences, 5* (11) (pp.1757-1769). https://doi.org/10.38159/ehass.202451111

Heled, E., & Davidovitch, N. (2021). Personal and Group Professional Identity in the 21st Century" Case Study: The School Counseling Profession". *Journal of Education and Learning*, *10*(3), 64-82.

Kagan, J. (2024). *Investopedia. Networking definition*. https://www.investopedia.com/terms/n/networking.asp

Kastberg, E., Buchko, A., & Buchko, K. (2020). Developing Emotional Intelligence: The Role of Higher Education. *Journal of Organizational Psychology*, *20*(3). https://doi.org/10.33423/jop.v20i3.2940

Lacroix, J., Dupont, L., Guidat, C., & Loterr, G. H. (2017). "Smarterized" urban project process with living lab approach: Exploration through a case study. *2017 International Conference on Engineering, Technology and Innovation (ICE/ITMC)*, 592–600. https://doi.org/10.1109/ICE.2017.8279939

Manches, A., & Plowman, L. (2017). Computing education in children's early years: A call for debate. *British Journal of Educational Technology*, *48*(1), 191-201.https://doi.org/10.1111/bjet.12355

Marciano, J. E., Peralta, L. M., Lee, J. S., Rosemurgy, H., Holloway, L., & Bass, J. (2020). Centering community: Enacting culturally responsive-sustaining YPAR during COVID-19. *Journal for Multicultural Education*, *14*(2), 163-175.https://doi.org/10.1108/JME-04-2020-0026

McPake, J., Plowman, L., & Stephen, C. (2013). Pre-school children creating and communicating with digital technologies in the home. *British Journal of Educational Technology*, *44*(3), 421-431. https://doi.org/10.1111/j.1467-8535.2012.01323.x

Michnick Golinkoff, R. & Hirsh-Pasek, K. (2016). *Becoming Brilliant: What Science Tells Us About Raising Successful Children*. American Psychological Association.

Miljković, D., Đuranović, M., & Vidić, T. (2019). *Odgoj i obrazovanje – iz teorije u praksu*. IEP-D2 i Učiteljski fakultet Sveučilišta u Zagrebu.

Moreno, J. L. (1956). *Sociometry and the Science of Man*. New York: Beacon House.

Nijland, F., Firssova, O., Robbers, S., & Vermeulen, M. (2023). The Networked Student, *Teaching and Teacher Education*, *131*, https://doi.org/10.1016/j.tate.2023.104169.

Oddone, K., Hughes, H., & Lupton, M. (2019). Teachers as Connected Professionals. *The International Review of Research in Open and Distributed Learning.* 20. https://doi.org/10.19173/irrodl.v20i4.4082

OECD (2021). *Teachers and Leaders in Vocational Education and Training*, OECD Reviews of Vocational Education and Training. Paris: OECD Publishing. https://www.oecd-ilibrary.org/sites/59d4fbb1-en/index.html?itemId=/content/publication/59d4fbb1-en

Olayinka, A. R. B. (2016). Effects of Instructional Materials on Secondary Schools Students' Academic Achievement in Social Studies in Ekiti State, Nigeria. *World Journal of Education*, *6*(1), 32-39.http://dx.doi.org/10.5430/wje.v6n1p32

Pando, V. F. (2018). Teaching Trends in Virtual Education: An Interpretative Approach. *Journal of Educational Psychology-Propositos y Representaciones*, *6*(1), 485-505.https://doi.org/10.20511/pyr2018.v6n1.167

Pascal, C., &Bertram, T. (2012). Praxis, ethics and power: Developing praxeology as a participatory paradigm for early childhood research. *European Early Childhood Education Research Journal*, *20*(4), 477-492. https://doi.org/10.1080/1350293X.2012.737236

Piao, Y., & Ma, J. (2018). Teaching design strategy of innovation and entrepreneurship course of college students. In *4th International Conference on Arts, Design and Contemporary Education /ICADCE* (pp.974-977). Atlantis Press. https://doi.org/10.2991/icadce-18.2018.211

Santiago, C. J., Ulanday, M. L., Centeno, Z. J., Bayla, M. C., & Callanta, J. (2021). Flexible Learning Adaptabilities in the New Normal: E-Learning Resources, Digital Meeting Platforms, Online Learning Systems and Learning Engagement. *Asian Journal of Distance Education*, *16*(2). https://asianjde.com/ojs/index.php/AsianJDE/article/view/580

Scager, K., Boonstra, J., Peeters, T., Vulperhorst, J., & Wiegant, F. (2016). Collaborative learning in higher education: Evoking positive inter dependence. *CBE—Life Sciences Education*, *15*(4), ar69.https://doi.org/10.1187/cbe.16-07-0219

Siemens, G. (2005). Connectivism: A learning theory for digital age. *International Journal of Instructional Tehnology and Distance Learning, 2*(1). http://www.itdl.org/

Soleymani, A., Laat, M., Itard, L., & Specht, M. (2022). How Networked learning can facilitate professional development? In J. Jaldemark, J., M. Håkansson Lindqvist, P. Mozelius, L. M. Öberg, M., De Laat, N. B., Dohn, T. &Ryberg, T. (Eds.), *Proceedings for the Thirteenth International Conference on Networked Learning* 2022 (pp. 229-237). Institute for Advanced Study in PBL, Aalborg University.https://www.aaudxp-cms.aau.dk/media/ebadergh/1274674_proceedings-for-the-thirteenth-international-conference-on-networked-learning_.pdf

Steinfield, C., Ellison, N. B., & Lampe, C. (2008). Social capital, self-esteem, and use of online social network sites: A longitudinal analysis. *Journal of applied developmental psychology*, *29*(6), 434-445.https://doi.org/10.1016/j.appdev.2008.07.002

Steenekamp, K., van der Merwe, M., & Mehmedova, A. (2018). Enabling the development of student teacher professional identity through vicarious learning during an educational excursion. *South African Journal of Education*,*38*(1), 1-8. https://doi.org/10.15700/saje.v38n1a1407

Sunko, E. & Marušić, A. (2022). Opinions of Future Teachers in Competencies for Working with Students with Developmental Disabilities. *Education and Development,* 416-420.https://doi.org/10.36315/2022v2end092

Teaching Degree (2022). *Professional NetworkinginTeaching.https://www.teachingdegree.org/resources/professional-networking/*

Trust, T., Krutka, D. G., & Carpenter, J. P. (2016). "Together we are better": Professional learning networks for teachers. *Computers & education*, *102*, 15-34. https://doi.org/10.1016/j.compedu.2016.06.007

UNESCO (2018). *Issues and trends in Education for Sustainable Development, Education on the Move*. https://unesdoc.unesco.org/ark:/48223/pf0000261801

UNESCO (2020). Humanistic futures of learning: perspectives from UNESCO chairs and UNITWIN networks. https://unesdoc.unesco.org/ark:/48223/pf0000372577

Valantinaitė, I., & Sederevičiūtė-Pačiauskienė, Ž. (2021). The Pros and Cons of Online Learning Environment from the Students' Perspective. Rural Environment. Education. Personality. 14. https://doi.org/10.22616/REEP.2021.14.026

Vjeće za djecu, Republika Hrvatska (2020). *Etički kodeks istraživanja s djecom*. M. AjdukovićiG.Keresteš(ur).https://mrosp.gov.hr/UserDocsImages/dokumenti/Socijalna%20politika/Obitelj%20i%20djeca/Eti%C4%8Dki%20kodeks%20istra%C5%BEivanja%20s%20djecom%20-%20integrirani%20tekst%20s%20prilozima.pdf

Visković, I. (2021). "Miss having in-person classes" – university studying during COVID-19 pandemic. *The Education and science journal, 23*(8): 61-83. https://cyberleninka.ru/article/n/miss-having-in-person-classes-university-studying-during-covid-19-pandemic

Visković, I. (2024). Umrežavanje u obrazovanju-izazovi i mogućnosti. U T.Maglica i I.Tomić Kaselj (eds.), Zbornik radova znanstveno-stručnog skupa 26. Dani ranog i predškolskog odgoja i obrazovanja Splitsko-dalmatinske županije *Mirisi djetinjstva –Umrežavanje kao strategija učenja* (pp. 23-28) Filozofski fakultet Split.

Visković, I., Marušić, A., & Topić, J. (2024). Umrežavanje kao strategija učenja studenata ranog i predškolskog odgoja i obrazovanja. U A. Bilić, T. Borovac, & I. SomolanjiTokić (eds.), *Zbornik radova s 1. Međunarodne znanstveno-stručne konferencije Kompetentni sustavi u ranom i predškolskom odgoju i obrazovanju–KOMPAS* (pp. 83-104). Sveučilište Josipa Jurja Strossmayera u Osijeku, Fakultet za odgojne i obrazovne znanosti u Osijeku; Hrvatska akademija znanosti i umjetnosti, Centar za znanstveni rad u Vinkovcima.

Visković, I., Višnjić Jevtić, A., & Marušić. A. (2023). Teachers' Opinions on Recognisable Aspects of the Institutional Early Childhood Education Culture. U M. Cindrić & K. Ivon (Eds). Rethinking Childhood II. Child and Space (pp.397-412). Sveučilište u Zadru.

Visković, I., Šimić, K., & Marušić, T. (2022). Studiranje tijekom pandemije. U D. Velički (ed.), *Suvremene teme u odgoju i obrazovanju – STOO* 2 (pp. 1-21). Učiteljski fakultet Sveučilišta u Zagrebu, Zavod za znanstveno istraživačk i iumjetnički rad u Bjelovaru Hrvatske akademije znanost i iumjetnosti.

Višnjić Jevtić, A., & Rogulj, E. (2022). "Should we get support or just guidelines?"(self) assessment on mentoring of early childhood education students. *International Journal of Mentoring and Coaching in Education*, *11*(3), 262-273.https://doi.org/10.1108/IJMCE-03-2021-0048

Vollenbroek, W., de Vries, S., & van Dijk, J. (2021). Supporting social capital by utilizing community network positions. *International Journal of e-Collaboration (IJeC)*, *17*(2), 40-54.10.4018/IJeC.2021040103

Vrasidas, C. (2000). Constructivism versus objectivism: Implications for interaction, course design, and evaluation in distance education. *International journal of educational telecommunications*, *6*(4), 339-362.https://www.vrasidas.com/wp-content/uploads/2007/07/continuum.pdf

Zhu, G., & Chen, M. (2022). Positioning pre-service teachers' reflections and I-positions in the context of teaching practicum: A dialogical-self theory approach. *Teaching and Teacher Education*, *117*, 103734.https://doi.org/10.1016/j.tate.2022.103734

Welsh, R. O. (2021). Assessing the quality of education research through its relevance to practice: An integrative review of research-practice partnerships. *Review of Research in Education*, *45*(1), 170-194.https://doi.org/10.3102/0091732X2098508

Willegems, V., Consuegra, E., Struyven, K., & Engels, N. (2018). Pre-service teachers as members of a collaborative teacher research team: A steady track to extended professionalism? *Teaching and Teacher Education*, *76*, 126-139. https://doi.org/10.1016/j.tate.2018.08.012

Умрежавање у виртуелном окружењу

Умрежавање је релативно нова стратегија учења и професионалног развоја. Подразумева повезивање људи, група и/или организација ради брже размене информација, знања и искустава, заједничког учења, истраживања и генерисања идеја. Иако почеци научног приступа умрежавању могу да се повежу са психолошким истраживањима групне динамике, развоју умрежавања је највише допринео развој информационо-комуникационих технологија. Умрежавање у виртуелном окружењу, иако има ограничења социјалних интеракција, олакшава комуникацију и (међународну) сарадњу и омогућава интеркултуралну повезаност.

Концепт умрежености заговара социјалну равноправност која је у пракси детерминисана социјалним компетенцијама и професионалним статусом појединца и/или група. Оно омогућава већу видљивост појединца и група и промовисање појединих идеја. Истовремено носи и ризик недовољно поузданих информација и могућност "скривања" иза заједничких одлука.

У стратешким документима ЕУ заговарају се све стратегије учења које могу да допринесу квалитету учења, бржој размени знања и генерисању нових идеја. Подстиче се учење као заједнички конструктивни процес подложан критичкој анализи. Расправа се подстиче као модел критичког разматрања садржаја учења. То доприноси трансформационом потенцијалу учења.

Поједина истраживања указују на постојећу високу умреженост већине појединаца током формалног образовања. Концепт умрежавања све је заступљенији и у високом образовању, као и у професионалном развоју појединца и група, на личној и професионалној равни. На пример, многе високообразовне институције иницирају умрежавање алумнија, као и студената и практичара. Ипак, тиме нису исцрпљене могућности умрежавања. Савремене технологије повезују дигитална и технолошка знања са социјалним интеракцијама.

Кључне речи: *размена информација, расправа, стратегије учења, учење у мрежном окружењу.*

Sieciowanie w wirtualnym środowisku

Chociaż początki naukowego podejścia do sieciowania można łączyć z badaniami psychologicznymi nad dynamiką interakcji grupowych, rozwojowi sieciowania prawdopodobnie najbardziej przysłużył się rozwój technologii informacyjno-komunikacyjnych. Sieciowanie w wirtualnym środowisku ogranicza interakcje społeczne, ale ułatwia komunikację i (międzynarodową) współpracę, a także umożliwia nawiązywanie międzykulturowych powiązań.

Koncepcja sieciowania zakłada równość społeczną, która w praktyce jest determinowana kompetencjami społecznymi i statusem zawodowym jednostek i/lub grup. Dzięki niej możliwa jest większa widoczność osób i grup, a także promowanie określonych idei, przy jednoczesnym ryzyku pojawienia się niewiarygodnych informacji i możliwości "ukrywania się" za wspólnymi decyzjami.

W strategicznych dokumentach UE promuje się wszystkie strategie uczenia się, które mogą przyczynić się do podniesienia jakości uczenia się, szybszej wymiany wiedzy i generowania nowych pomysłów. Uczenie się przedstawia się jako proces wspólnotowy i konstruktywny, podlegający krytycznej analizie. Z tego względu zachęca się do dyskusji jako modelu krytycznej refleksji nad treściami nauczania, co wzmacnia transformacyjny potencjał uczenia się.

Niektóre badania wskazują, że sieciowanie jest szeroko wykorzystywane przez większość studentów w trakcie edukacji formalnej. Koncepcja sieciowania jest coraz bardziej obecna w szkolnictwie wyższym oraz w rozwoju zawodowym jednostek i grup – zarówno na poziomie osobistym, jak też profesjonalnym. Przykładowo, wiele instytucji szkolnictwa wyższego inicjuje sieciowanie wśród absolwentów, studentów i praktyków. Nie wyczerpuje to jednak możliwości sieciowania. Nowoczesne technologie łączą wiedzę cyfrową i technologiczną z interakcjami społecznymi.

Słowa kluczowe: *dyskusja; wymiana informacji; strategie uczenia się; uczenie się w środowisku sieciowym.*

Umrežavanje u virtualnom okruženju

Umrežavanje je relativno nova strategija učenja i profesionalnog razvoja. Pretpostavlja povezivanje ljudi, grupa i/ili organizacija radi brže razmjene informacija, znanja i iskustava, zajedničkog učenja, istraživanja i generiranja ideja.

Iako se početci znanstvenog pristupa umrežavanju mogu povezati s psihologijskim istraživanjima grupne dinamike, razvoju umrežavanja moguće je najviše doprinio razvoj informacijsko-komunikacijskih tehnologija. Umrežavanje u virtualnom okruženju, iako ima ograničenja socijalnih interakcija, olakšava komunikaciju i (međunarodnu) suradnju te omogućava interkulturalnu povezanost.

Koncept umreženosti zagovara socijalnu jednakopravnost koja je u praksi determinirana socijalnim kompetencijama i profesionalnim statusom pojedinca i /ili grupa. Omogućava veću vidljivost pojedinca i grupa te promicanje pojedinih ideja. Istodobno donosi i rizik nedostatno pouzdanih informacija te mogućnost "skrivanja" iza zajedničkih odluka.

U strateškim dokumentima EU zagovaraju se sve strategije učenja koje mogu doprinijeti kvaliteti učenja, bržoj razmjeni znanja i generiranju novih ideja. Promiče se učenje kao zajednički konstruktivni proces podložan kritičkoj analizi. Rasprava se potiče kao model kritičkog razmatranja sadržaja učenja. To doprinosi transformacijskom potencijalu učenja.

Pojedina istraživanja ukazuju na postojeću visoku umreženost većine pojedinaca tijekom formalnog obrazovanja. Koncept umrežavanja sve više je zastupljen i u visokoškolskom obrazovanju te profesionalnom razvoju pojedinca i grupa, na osobnoj i profesionalnoj razini. Primjerice, mnoge visokoškolske institucije iniciraju umrežavanje alumni te studenata i praktičara. Ipak, time nisu iscrpljene mogućnosti umrežavanja. Suvremene tehnologije povezuju digitalna i tehnološka znanja uz socijalne interakcije.

Ključne riječi: *razmjena informacija, rasprava, strategije učenja, učenje u mrežnom okruženju.*