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The Role of Exposure to Open Educational Resources in the Training of Early Childhood Education Teachers

Summary of the Doctoral Thesis

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INTRODUCTION

The development of digital technologies has created new opportunities for access to knowledge and diversification of learning experiences. Open educational resources (OER) are one of the relevant expressions of these transformations, through the possibilities of accessing, reusing, adapting and redistributing educational content, subject to compliance with the associated licenses. Beyond the technological dimension, OER promotes an educational approach based on openness, collaboration, flexibility and active participation in the construction of knowledge. Their potential is significant both for facilitating access to education and for developing pedagogical practices adapted to the needs and particularities of beneficiaries. The digitalization of education, accelerated by the experience of online education since 2020, has highlighted the formative potential of digital technologies, but also the challenges associated with their use.

Teacher training is an area where the use of OER can contribute to improving the quality of educational processes. In the face of constant changes in the social and technological environment, teachers are required to update their skills, critically integrate digital tools and adopt flexible pedagogical strategies focused on learning needs. In the case of early childhood education teachers, the integration of open educational resources requires a balanced approach that respects the needs and developmental particularities of children aged 0 to 6 and that capitalizes on the benefits of technology without diminishing the importance of children's direct interaction with the environment and interpersonal relationships.

Although access to digital technologies and resources has expanded considerably, their use for educational purposes is not determined exclusively by the availability of infrastructure or familiarity with technological tools. Individual attitudes, digital behaviors, pedagogical skills, training experiences and characteristics of the professional context can be associated with teachers' readiness to capitalize on OER. In this sense, investigating the relationships between digital behaviors, attitudes towards open educational resources and the intention to use digital technologies is relevant for understanding the processes of their acceptance and integration in professional training.

Starting from these premises, this doctoral thesis addresses the issue of open educational resources from the perspective of their contribution to the initial and continuous training of early childhood education teachers. The research approach aims to theoretically substantiate the relationship between lifelong learning, digital skills, open pedagogy and professional development, as well as to empirically investigate some factors associated with the attitude towards OER and the intention to use digital technologies. The research integrates two complementary empirical studies, carried out on distinct groups, consisting of 225 students in the initial training stage and 228 qualified early childhood education teachers.

The scientific and applied relevance of the research lies in the integrated approach to the initial and continuous training of early childhood education teachers, as well as in the investigation of individual and professional factors that can influence the acceptance and use of open educational resources. By capitalizing on information from the academic literature and the results of the two empirical studies, the thesis aims to contribute to deepening knowledge in the field of digital pedagogy and to identifying directions for optimizing teacher training. The contributions of the research, both at a theoretical and practical level, highlight the importance of adopting educational practices adapted to the knowledge society, based on the balanced capitalization of the opportunities offered by digital technologies and the need for continuous updating of professional skills.

CHAPTER 1. KNOWLEDGE SOCIETY AND TEACHERS' DIGITAL COMPETENCES

The knowledge society is characterized by accelerated transformations in all areas of life, by the recognition of the value of information and knowledge as strategic resources and by the expansion of opportunities for access to education. The evolution from industrial to post-industrial society has determined the reconsideration of the role of education, investments in this field becoming a fundamental condition for individual and social development. In this context, the capacity to adapt to change, the permanent updating of skills and the responsible use of digital technologies represent essential premises for active participation in the life of society (Antonesei, 1996; Bell, 1976).

Lifelong learning is one of the defining characteristics of the knowledge society, promoting the continuous development of the personality by integrating formal, non-formal and informal learning experiences. The concept brings together two complementary dimensions: lifelong learning, which highlights the continuity of learning throughout life, and lifewide learning, which values the diversity of contexts in which learning occurs. (Brooks et al., 2008). From this perspective, education goes beyond the institutional and temporal limits of schooling, becoming a flexible, individualized process oriented towards the development of personal, social and professional skills. Responsibility for one's own learning, autonomy and the ability to critically select information thus acquire particular importance. However, participation in lifelong education can be conditioned by individual and institutional barriers, such as: the level of personal motivation, socioeconomic status, geographical location, access to infrastructure, the characteristics of education providers and the quality of educational services. To overcome these difficulties, it is necessary to diversify training programs and develop flexible ways of accessing knowledge.

In the knowledge society, the development of teachers' digital skills is an important component of continuing professional development. The rapid pace of technological progress requires the permanent updating of these skills, so that teachers can capitalize on the opportunities offered by digital technologies and open educational resources. In this sense, the development of digital skills involves not only the use of digital tools, but also the ability of teachers to select and integrate educational resources in relation to children's learning needs and the proposed educational objectives. Open educational resources are simultaneously products of lifelong education, responses to the need/requirements of human lifelong education and "fuel" of lifelong education: products of already existing knowledge can be a starting point or sources of inspiration for new directions of exploration. They can offer all forms of education (formal, non-formal and informal), right at the beneficiaries' homes, at their own pace and according to their learning availability and needs. The use of OER in learning encompasses both dimensions of permanent education (lifewide and lifelong), covering the entire existence of the individual and transforming it into a continuous experience of training, development and updating.

CHAPTER II. PROFESSIONAL TRAINING OF TEACHING STAFF AND OPEN EDUCATIONAL RESOURCES. NARRATIVE REVIEW

The accelerated transformations generated by digital technologies in recent decades have led to the emergence of new educational paradigms and concepts designed to explain the changes in the way of teaching, learning and teacher professional development. Understanding education is no longer possible only through the lens of traditional concepts, but involves the integration of digital, which has the potential to shape and improve learning experiences, relationships between participants in teaching practice and access to educational resources. In this context, digital pedagogy, open pedagogy and open educational practices reflect the profound transformations generated by technology on the educational process, and open educational resources (OER) become relevant both for teaching practice and for the training and professional development of teachers.

In the context of our thesis, the analysis of the academic literature aims to understand the factors that influence the acceptance and use of educational technologies, professional training models and the opportunities offered by technology for the development of teachers' competencies. Particular attention is paid to the training of teachers for early childhood education, considering the particularities of the professional profile, the need to update competencies and the role of open educational resources in adapting pedagogical practices to the requirements of contemporary society.

Theoretical models of technology acceptance in education

The acceptance and use of digital technologies in education can be explained through theoretical models that highlight the relationships between attitudes, behavioral intentions, individual perceptions and contextual conditions. The TRA, TPB, TAM and UTAUT models offer complementary perspectives on the psychological and social factors that influence the decision to use technology, while the SAMR and TPACK models allow the analysis of its integration into educational practices.

The Theory of Reasoned Action (TRA) and the Theory of Planned Behavior (TPB) explain the relationship between behavioral intention and a person's voluntary behavior. Ajzen

and Fishbein investigated this relationship. highlighting the fact that the intention is formed based on attitudes, social pressure - expressed through the subjective norm and the individual's belief that they have the capabilities and resources necessary to carry out the behavior. Thus, the more positive a person's attitude is, the more important people for them support the behavior and the higher the confidence in their own capabilities, the stronger the behavioral intention becomes. (Ajzen, 2012). Applied in education, these models contribute to understanding how teachers' beliefs, the influence of the professional environment and the perception of their own skills can influence the adoption of digital technologies.

Technology Acceptance Model (TAM), developed by Davis (1989), starts from the perspective that behavior is conditioned by the previous existence of an affective response, represented by attitude, which, in turn, is influenced by the cognitive response. Within this model, perceived usefulness and ease of use are essential factors in the acceptance of technology. The two dimensions, along with attitude, relate to intrapersonal processes and express what users think, believe and feel in relation to technology, as well as how they act accordingly.

Assuming that the acceptance of new technologies by adults involves more factors than perceived usefulness and ease of use, Kim et al. (2016) adapt the TAM model for the context of open educational resources, introducing three additional factors associated with the interpersonal dimension: subjective norm, job fit and self-efficacy. Subsequent extensions, TAM 2 and TAM 3, integrate cognitive and social factors and highlight the importance of previous experience in using digital technologies. Venkatesh and Bala (2008) show that, as users gain experience, the influence of ease of use on behavioral intention decreases, while its influence on perceived usefulness increases. Therefore, perceived usefulness remains relevant even for people with significant experience in using technology.

The Unified Theory of Acceptance and Use of Technology (UTAUT), formulated by Venkatesh et al. (2003), synthesizes eight previous theories and proposes a more comprehensive explanatory framework. The model integrates four major determinants of behavioral intention and technology use: performance expectancy, effort expectancy, social influence, and enabling conditions. It also introduces moderating factors, such as gender, age, experience, and willingness to use. According to the authors, UTAUT explains approximately 70% of the variation in intention and usage behavior, compared to approximately 40% in the case of TAM.

The model thus highlights that technology adoption does not depend exclusively on individual attitudes, but also on the characteristics of users and the conditions in which it is integrated.

Beyond explaining the use of technology, pedagogical models look at how the use of digital tools can improve or transform educational practices. The SAMR model (Substitution, Augmentation, Modification, Redefinition), proposed by Puentedura (2009), is used to describe the levels of integration of digital technologies in teaching activities. Its popularity is associated with its clear language, graphic representation and accessibility. However, the academic literature indicates limitations regarding the theoretical foundation, the possibility of multiple interpretations and the hierarchical nature of the model, which can lead to excessive simplification of the technology integration process (Blundell et al., 2022; Zamri et al., 2025). In this regard, it is recommended to relate the changes produced by technology to previous educational practices and to comparatively analyze the roles and actions of teachers and students.

The Technological Pedagogical Content Knowledge (TPACK) model, developed by Mishra and Koehler, addresses technology integration from the perspective of teachers' professional knowledge. It brings together scientific knowledge of the taught field, pedagogical knowledge and technological knowledge, emphasizing the need to articulate them in the design and implementation of teaching practice. In the updated version, presented by Petko et al. (2025), the model also includes contextual knowledge, highlighting the dynamic nature of professional skills and the influence of the educational context on the use of technology.

Taken together, these models provide an understanding of the phenomenon from the individual psychological to the pedagogical and institutional levels. Acceptance models explain the individual motivations of teachers, and pedagogical models present the ways in which technology can transform educational practices. The literature consulted thus supports an integrated approach, in which the intention and acceptance of technology must be correlated with pedagogical strategy and professional development processes.

Digital skills in the context of teacher training

The concern regarding the professional development and evolution of teachers has been constant over time, as the teaching profession is a fluid one, permanently connected to the needs of society and the learning needs of students. For this reason, teachers' competencies must be

updated and developed periodically, and professional training must be understood as a continuous process, which goes beyond the initial training stage.

Leland et al. (1984) describe the professional development of teachers as having four stages: the survival phase, the competence phase, the strategy phase and the synergy phase. The first stage is associated with the acquisition of authority and classroom management, while the competence phase involves the refinement of basic teaching, learning and assessment skills. The strategy phase is characterized by the teacher's orientation towards the individual needs of students, the individualization of instruction and the valorization of their autonomy. In the synergy phase, the concern for quantitative results is complemented by the attention paid to the quality of teaching practice, the integral development of the student and the construction of an educational environment based on safety, mutual respect and support. This perspective highlights the complexity of the teaching profession, which involves combining specialized knowledge with psychopedagogical and methodological ones, as well as the valorization of personality traits and one's own teaching style. The integration of technology adds new dimensions to the professional profile, without diminishing the importance of fundamental pedagogical skills. Digital competence is not reduced to the technical ability to use devices or applications, but involves their selection, adaptation and integration into teaching, learning and assessment activities, in line with educational objectives.

In the context of early childhood education teacher training, this dimension acquires particular relevance. The professional profile requires skills in designing and organizing learning experiences, observing and evaluating children's progress, communicating and collaborating with the family and other educational partners. The use of digital technologies must be related to the specifics of child development and the particularities of educational activities carried out in ante-preschool and preschool education.

Initial training is the foundation for the professionalization of the teaching career, but the development of the skills necessary for educational practice continues throughout the career. In Romania, recent regulations have included digital skills in the training profile of teachers, confirming the importance of using technology both in teaching practice and in research and professional development activities. At the same time, changes regarding the organization of undergraduate university programs in the field of early childhood education highlight the

concern for strengthening practical training and for achieving a closer link between theoretical training and direct experience in educational institutions. In this context, professional training models through the integration of digital technologies must capitalize on both the skills already acquired by teachers and the learning opportunities offered by digital environments. It is not enough to be familiar with technological tools; it is necessary to develop the capacity to use them critically, reflectively and appropriately for educational situations. The training of digital skills thus becomes an integral part of the professionalization of the teaching career.

The role of open educational resources in the professional development of teachers

Digital technology influences the professional development of teachers both by diversifying the ways of accessing training and by transforming the practices of collaboration, communication and exchange of experience. In the knowledge society, open educational resources can be used as tools that mediate professional learning. An important advantage of OER is the possibility of accessing, using and adapting educational materials according to the concrete needs of teachers and education beneficiaries. They can contribute to diversifying teaching strategies, updating content and developing open educational practices, based on collaboration and exchange of resources. At the same time, the use of OER requires skills in identifying, selecting, evaluating and pedagogically integrating available materials, so that they meet learning objectives and the particularities of the educational context.

The impact of technology on professional training is also manifested by the expansion of learning opportunities beyond the traditional institutional framework. Digital platforms, online courses and professional communities allow teachers to participate in training activities, consult updated resources and communicate with other specialists, without the constraints imposed by physical presence in a certain space. In this way, technology can facilitate access to training for teachers from different geographical and social backgrounds. A significant contribution comes from professional learning communities, which create contexts for collaboration, reflection and development of pedagogical practices. Within them, teachers are not only beneficiaries of training, but also sources of professional knowledge. Experienced teachers can provide guidance and examples of practice, while teachers at the beginning of their careers can contribute with updated perspectives and skills acquired during initial training, including in the digital field. Participation in professional communities favors the sharing of resources, the analysis of

educational experiences and the development of solutions adapted to concrete situations encountered in the classroom. Research reviewed by Bolam et al. (2005) and Vescio (2008) highlights characteristics such as collaboration, shared responsibility for children's progress, shared values, trust, respect and mutual support. These elements are associated with teacher professional development, changes in teaching practice and transformation of the school's organizational culture.

For early childhood educators, learning communities and open educational resources can support the exchange of experiences on organizing activities, adapting materials to children's specificities, and identifying ways to integrate technology. At the same time, the use of ICT outside the classroom expands the possibilities for documentation, professional communication, preparation of activities, and participation in continuing education programs.

However, mere exposure to technology or open educational resources does not guarantee the development of professional skills. Their valorization requires a well-founded pedagogical approach, the ability to critically evaluate materials and the willingness of teachers to reflect on their own practices. Therefore, the role of technology must be analyzed in relation to the objectives of training, professional needs and the possibilities of transferring knowledge and skills in teaching.

Current trends in teacher professional development reflect the need for more flexible, accessible and connected forms of training to the realities of educational practice. In this regard, the analyzed literature highlights online professional training, the need to reconsider blended learning models and the development of professional learning communities as relevant directions for updating continuous training systems. Online professional training offers the possibility of completing programs asynchronously and at one's own pace, reducing constraints related to the availability of free time and travel to training centers. This modality can provide professional development opportunities to a larger number of teachers, with a lower consumption of resources and with increased flexibility. From the perspective of OER integration, online training represents a favorable context for their valorization both as tools that mediate the training process and as content elements of courses. At the institutional level, effective professional training requires the participation and collaboration of actors involved in education, including teachers, institutional management, parents and specialists. In this way, professional

development is no longer limited to the individual accumulation of knowledge, but becomes part of a process of transforming educational practices and organizational culture.

Overall, the analysis of current theoretical models of professional training highlights that the integration of technology in education is a complex process, in which individual acceptance, digital skills, pedagogical strategies and institutional conditions are interdependent. Acceptance models explain the factors that influence the intention to use, pedagogical models provide benchmarks for the integration of technology in teaching, and professional training theories highlight the conditions necessary for continuous teacher training. In this framework, open educational resources and professional learning communities can contribute to updating skills and diversifying educational practices, provided that the use of technology is supported by pedagogical reflection, collaboration and permanent reporting to the real needs of the educational process.

CHAPTER 3. ATTITUDE OF FUTURE EARLY EDUCATION TEACHERS TOWARDS THE USE OF OER IN PROFESSIONAL TRAINING. EMPIRICAL STUDY

This chapter presents an empirical study on the attitude of prospective early childhood education teachers towards the use of open educational resources in initial professional training. The general hypothesis (H1) assumed that digital autonomy, through its four dimensions (digital routine, digital multitasking, visual communication and immediate gratification), together with participation in courses on the use of digital technologies, explains to a significant extent the attitude towards OER. Five specific hypotheses were also formulated, according to which digital routine (H1a), digital multitasking (H1b), visual communication (H1c), immediate gratification (H1d) and participation in courses on the use of digital technologies (H1e) each explain to a significant extent the attitude towards OER.

The study was conducted on a group of 225 students majoring in Primary and Preschool Education, from a public university in Romania, of whom 220 were female (97.8%) and 5 were

male (2.2%). Data were collected online, between June 2021 and January 2023, through a questionnaire that included two validated and adapted Romanian language instruments: *the Digital Natives Assessment Scale* (DNAS; Teo, 2013), to assess digital autonomy, and *the Attitude towards Open Educational Resources* (ATOER; Mishra, 2016), to assess attitude towards OER. Data analysis was performed using IBM SPSS and Jamovi programs, using factorial and internal consistency analyses to verify the psychometric properties of the instruments, respectively Pearson correlation and linear regression to test hypotheses.

To explore the factors associated with the variable "attitude towards OER", several predictors were tested using Pearson correlations and simple linear regression analyses. Correlational analyses revealed negative, low-intensity, but statistically significant relationships between the following predictors: digital autonomy ($r= -0.161$, $p= 0.015$); digital routine ($r= -0.217$, $p= 0.001$); digital multitasking ($r= -0.170$, $p= 0.011$); immediate gratification ($r= -0.155$, $p= 0.020$). In contrast, no significant relationships were identified between attitude towards OER and visual communication ($r= 0.019$, $p= 0.782$), respectively participation in courses for the use of digital technologies ($r= 0.019$, $p= 0.772$).

The results of the simple linear regression analyses confirmed these trends. The models were significant for the predictors "digital autonomy" ($F(1,223)= 5.968$, $p= 0.015$, $R^2= 0.026$), "digital routine" ($F(1,223)= 11.058$, $p= 0.001$, $R^2= 0.047$), "digital multitasking" ($F(1,223)= 6.608$, $p= 0.011$, $R^2= 0.029$) and "immediate gratification" ($F(1,223)= 5.505$, $p= 0.020$, $R^2= 0.024$). The regression coefficients indicated, in all cases, a negative relationship between the predictor and the dependent variable, confirming the direction suggested by the correlations. On the other hand, the models that included as independent variables "visual communication" ($F(1,223)= 0.077$, $p= 0.782$, $R^2= 0.000$) and "participation in ICT courses" ($F(1,223)= 0.084$, $p= 0.772$, $R^2= 0.000$) were not significant, indicating the lack of a predictive relationship.

The negative correlation of digital routine and digital multitasking with teachers' attitudes towards OER suggests that training activities on the use of digital technologies should include modules that present strategies for teachers to recognize and manage cognitive fatigue and attention fragmentation caused by multitasking and digital routine. Modules that include digital self-regulation strategies would also be needed: using technology with a clear purpose, using it responsibly and taking regular breaks. In teacher training, the emphasis should be on developing

skills to manage time spent online, setting healthy boundaries and integrating digital technologies into deliberate pedagogical purposes, as well as strategies for focusing attention on individual tasks to avoid attention fragmentation.

The higher level of immediate gratification orientation associated with lower scores on OER attitudes suggests that teacher training modules that develop self-regulation and resistance to the need to obtain immediate rewards, especially in digital contexts, are needed. This aspect has direct relevance for modeling young children's behaviors, which mimic how adults respond to digital rewards.

No statistically significant association was identified between attitude towards OER and either visual communication or participation in an ICT course. Teacher training in the use of digital technologies needs to become more complex and specific, from the stage of courses that aim at digital literacy to activities that present solutions for the meaningful integration of digital technologies in education, which make learning deeper and bring new nuances, impossible to achieve in the traditional manner of teaching. Therefore, there is a need for training programs that are more applicative, focused on self-regulation, critical thinking and reflective use of technology.

The results showed that digital autonomy (digital routine, digital multitasking and immediate gratification) was negatively associated with ATOER scores, but the effect was modest. Digital routine, digital multitasking and immediate gratification also negatively correlated with attitudes towards open educational resources, suggesting that the use of technology for the purpose of performing routine or rigid tasks and which are oriented towards obtaining an immediate reward is associated with lower scores of attitudes towards OER, within the analyzed sample. In contrast, no significant relationships were identified between visual communication and participation in courses on the use of digital technologies with attitudes towards OER. These results confirm the observations in the academic literature, according to which the formation of positive attitudes towards OER is not based only on digital familiarity, but requires the reflexive integration of technology into teaching practice and the training/development of associated pedagogical skills. The data obtained suggest that attitudes towards OER are fragile and sensitive to digital usage patterns. Practices such as mechanical routine, multitasking and immediate gratification are associated with less positive perceptions of

OER. In contrast, simply participating in courses on the use of digital technologies or developing visual communication guarantees a change in attitudes towards OER. Early childhood education teacher training must go beyond technical training and integrate psychological and pedagogical dimensions of digital use: self-regulation, balance, responsibility. The results of this study show that everyday digital practices (digital routine, digital multitasking and immediate gratification) are negatively associated with attitudes towards OER, although the observed relationships are weak. At the same time, visual communication and participation in courses on the use of digital technologies were not significantly associated with attitudes towards OER.

CHAPTER 4. ATTITUDE OF EARLY EDUCATION TEACHERS TOWARDS THE USE OF OER IN VOCATIONAL TRAINING. EMPIRICAL STUDY

This chapter presents an empirical study on the attitude of early childhood education teachers towards open educational resources (OER) and their intention to use digital technologies in the context of continuous professional development. The research starts from the importance of integrating OER into the professional development of teachers and from the need to capitalize on them not only as educational materials and contents, but also as means of improving the teaching and learning process. Given that the integration of OER into the continuous professional development of teachers is a less studied area in Romania, the study aims to identify the factors associated with the acceptance and use of digital technologies, with possible implications for the organization of continuous professional development programs. To this end, three research hypotheses were formulated. The first hypothesis (H1) assumed that the level of continuous professional development, expressed by the professional teaching grade and the level of education, explains to a significant extent the attitude towards OER. the second hypothesis (H2) aimed to determine whether those same variables explain to a significant extent teachers' intention to use technology. The third hypothesis (H3) considered the role of attitude towards OER in explaining teachers' intention to use technology.

The research was conducted between January and August 2023, on a group of 228 qualified early childhood education teachers, of whom 83.3% worked at the preschool level, 14.5 at the primary level (having a double specialization) and 2.2% at the pre-preschool level. In terms of professional training, 30.7% of the participants held the Definitive Teaching Certification, 23.7% Teaching Degree II and 42.1% Teaching Degree I. Regarding the level of education, 50% had completed bachelor's degrees, 39% master's degrees, 10.1% high school degrees and 0.9% doctoral degrees. Data were collected through an online questionnaire, which included *the Attitude towards Open Educational Resources* (ATOER; Mishra, 2016) scale, to assess attitude towards OER, and a scale adapted from *the Technology Acceptance Model* (TAM; Kim et al., 2015), to assess acceptance and intention to use technology. The instruments were adapted into Romanian through double translation. Internal consistency analyses revealed high Cronbach alpha coefficients for both instruments (α= 0.936 for ATOER and α= 0.987 for TAM). Since exploratory and confirmatory factor analyses did not reproduce the structures of the two theoretical models, the total scores of the scales were used in subsequent analyses. Data processing was performed using IBM SPSS, using univariate ANOVA, Pearson correlation and simple linear regression, in order to verify the formulated hypotheses.

To examine the differences in the scores obtained in the participants' attitude towards OER according to the level of professional training and level of education, we used the univariate ANOVA test. The poorly represented groups (participants without a professional teaching grade, N= 8 and participants with doctoral studies, N=2) were included in the closest category, as follows: respondents without a professional teaching grade were introduced alongside those with a degree; respondents with doctoral studies were introduced alongside those with a master's degree.

Descriptive results indicated a trend of increasing scores simultaneously with increasing professional teaching grade (M (no degree/Definitive Teaching Certification) = 4.09; M (Grade II) = 4.18; M (Grade I) = 4.29). However, the differences between groups did not reach statistical significance, ($F(2,225) = 2.769$, $p = 0.065$). The effect size indicated a small value, $\eta^2 = 0.024$, suggesting that the level of continuing professional development explains only approximately 2% of the variability of the scores. Although there is a slight tendency for the scores of attitude towards OER to be higher in teachers with a higher professional teaching grade, the effect is

small and statistically insignificant. Therefore, the level of professional development (professional teaching grade) was not significantly associated with attitudes towards OER of early education teachers. Analysis of variance (univariate ANOVA) was used to examine the differences in total scores of attitude towards OER, depending on the level of education (high school, bachelor's degree, master's degree and doctoral degree). The means indicated a gradual increase in scores, simultaneously with the evolution of the educational level (M(high school) = 4.07; M(bachelor's degree) = 4.16; M(master's/doctoral degree) = 4.27). However, the differences between groups did not reach the threshold of statistical significance ($F(2, 225) = 1.604$, $p = 0.203$). The effect size estimates indicated low values ($\eta^2 = 0.014$), which suggests that only approximately 1% of the variability in scores is explained by the level of education. Therefore, there is a tendency for the scores of attitude towards OER to increase in participants with a higher educational level, but this effect is small and statistically insignificant. The results of the two ANOVA analyses, with attitude towards OER as the dependent variable, showed that neither the level of professional development nor the level of education of the participants significantly influenced the scores obtained. Although the means indicated a slight tendency for scores on attitude towards OER to increase with career advancement (obtaining professional teaching grades) or with increasing level of education, these differences did not reach the threshold of statistical significance ($p>0.05$). The effect size was small ($\eta^2= 0.024$ for professional teaching grade and $\eta^2= 0.014$ for level of education), which suggests that these variables explain less than 3% of the variability of the scores. Thus, the attitude towards OER remains relatively constant, regardless of the professional experience formally certified by obtaining professional teaching grades or the educational level completed.

One-way ANOVA was used to investigate differences in intention-to-use-technology scores according to continuing professional development level (professional teaching grade attained). Mean scores were slightly higher among participants holding Teaching Grade II ($M = 4.11$) than among those with no teaching grade/Definitive Teaching Certification ($M = 3.86$) and those holding Teaching Grade I ($M = 4.01$). The differences were not statistically significant ($F(2, 225) = 1.275$, $p = 0.281$). The effect size was small ($\eta^2 = 0.011$), suggesting that professional teaching grade accounted for approximately 1% of the variability in intention-to-use-technology scores. Thus, continuing professional development level was not significantly associated with intention to use technology in the sample investigated. One-way ANOVA was also used to

examine differences in intention-to-use-technology scores according to educational attainment (upper-secondary, bachelor's, and master's/doctoral studies). Descriptive results indicated progressively higher means with increasing educational attainment (M(upper-secondary) = 3.71; M(bachelor's) = 3.83; M(master's/doctoral) = 4.25). The ANOVA revealed statistically significant differences between educational attainment groups ($F(2, 225) = 7.143$, $p < 0.001$). The effect size was $\eta^2 = 0.060$, indicating that approximately 6% of the variance in intention-to-use-technology scores was explained by educational attainment, a small-to-moderate effect. Participants with postgraduate qualifications (master's or doctoral degrees; M = 4.25) had higher mean scores than those with upper-secondary education (M = 3.71) or a bachelor's degree (M = 3.83). The two ANOVA analyses with intention to use technology as the dependent variable thus yielded contrasting findings: professional teaching grade was not significantly associated with intention to use technology ($F(2, 225) = 1.275$, $p = 0.281$, $\eta^2 = 0.011$), whereas educational attainment was ($F(2, 225) = 7.143$, $p < 0.001$, $\eta^2 = 0.060$). Pearson's correlation analysis also revealed a positive, statistically significant association between attitudes towards OER and intention to use digital technologies ($r = 0.178$, $p = 0.003$). Separately, simple linear regression showed a statistically significant model predicting intention to use digital technologies from attitudes towards OER ($F(1, 226) = 7.410$, $p = 0.007$), accounting for 3.2% of the variance ($R^2 = 0.032$). The regression coefficient ($B = 0.288$, $p = 0.007$) indicated that more favorable attitudes towards OER were associated with stronger intentions to use digital technologies. In conclusion, attitudes towards OER were a statistically significant but weak predictor of intention-to-use-technology scores, suggesting a positive relationship between these two dimensions and the need to consider additional factors to explain variation in intentions to use technology.

The results obtained show us a nuanced picture of the relationships between socio-demographic factors (level of continuing professional training and level of education) and the attitude of early childhood education teachers towards OER, respectively towards the acceptance and adoption of digital technologies in education. The results indicated slight differences in the average scores on the "attitude towards OER" of the participants, depending on the professional teaching grade attained and the educational level completed. These results, although indicating differences, were not statistically significant, and the effect size was reduced in both cases. In the case of scores associated with the intention to use digital technologies, the

average increased with the level of education. The differences were statistically significant, and the educational level explained approximately 6% of the variability of the scores. The significantly higher scores of acceptance and adoption of technology in the case of participants with postgraduate studies are in agreement with those obtained in other studies (Lin & Yu, 2023; Li et al., 2025), which report that academic experience (level of education) is significantly associated with the desire to learn through digital technologies. However, the analysis according to the professional teaching grade did not reveal significant differences, the effect size being small. This result is confirmed by Serin & Bozdağ (2020), who mention that teachers' attitudes towards the use of technology in the instructional-educational process and behaviors related to digital autonomy do not show significant differences depending on the level of continuing professional development (professional teaching grade). The positive, albeit modest, correlation between attitude towards OER and intention to accept and use digital technologies suggests that teachers with more favorable attitudes towards open educational resources tend to show a greater willingness to accept and use technologies, a result supported by studies showing that positive perceptions of perceived usefulness and ease of use lead to a more positive attitude and a greater intention to adopt technology (Davis, 1989; Teo, 2013).

CHAPTER 5. CONCLUSIONS AND PERSPECTIVES ON FUTURE EMPIRICAL STUDIES

If until now OER have been predominantly resources intended to facilitate free access to educational content, following our analyses, we consider it justified to expand the perspective on them, by highlighting their role in the training and professional development of teachers. Analyses of the academic literature show that the integration of OER in educational practice stimulates collaboration, favors the development of digital skills and encourages pedagogical co-creation. The results of the two empirical studies outline a complex picture of the attitude of early childhood education teachers towards open educational resources (OER) and the acceptance and use of digital technologies. The analyses show that attitudes are not determined by socio-demographic factors (educational level, level of continuous professional development)

or by participation in formal courses for the use of technology, but are shaped by contextual, cognitive and motivational factors (digital routine, digital multitasking, immediate gratification). On the other hand, the intention to integrate technology into teaching practice is positively associated with the attitude towards OER and with the educational level and is not influenced by the level of professional training (professional teaching grade).

Digital behavior (digital habits: digital routine, multitasking, immediate gratification) is negatively correlated with attitude towards OER, which suggests that an intense, routine and fragmented consumption of technology may reduce teachers' willingness to integrate technology into teaching practice. High digital autonomy does not automatically imply a positive attitude towards OER, which suggests that technological familiarity does not guarantee openness to integrating technology into learning. Training courses for the use of digital technologies do not have a significant impact on attitude towards OER, this aspect highlighting the importance of the quality and relevance of training, more than formal participation. Therefore, ICT courses do not represent a way to cultivate teachers' attitude towards OER and acceptance and adoption of digital technology. The level of education (high school, bachelor's degree, master's/doctorate) is associated with a more positive attitude towards the use of technologies, while the attitude towards OER is not influenced by this factor. Also, the positive, albeit modest, relationship between attitude towards OER and acceptance and use of technology shows that teachers who demonstrate openness towards OER tend to accept digital technologies, overall.

The results obtained may have implications for educational policies and for the field of teacher training. A first suggestion would be to redefine in-service training programs for the use of digital technologies: traditional training, focused on the technical aspects of the use of technology, does not seem to be sufficient to change teachers' attitudes towards technology. Integrative programs are needed, which emphasize concrete pedagogical scenarios in which technology is integrated and also on the link between technology and the development of students' skills (technology to be used meaningfully and to bring added value to teaching practice). Since digital routine and multitasking are negatively associated with attitudes towards OER, it is important that teacher training programs include modules aimed at developing skills for managing attention and time spent in the digital environment. Being a model for students, it is essential that teachers (and, in general, significant adults for children) are aware of the

importance of the responsible use of technology. According to the results, differences in attitude towards OER are not related to professional teaching grade, but rather to educational level.

For high schools/universities and other institutions providing teacher training programs, it is recommended to integrate policies to support the use of OER, including by creating communities of practice and spaces that facilitate collaboration between teachers and the exchange of good practices (implicitly, sharing OER). Also, organizing interactive workshops, with a focus on the pedagogical (and not just technical) use of technology, would contribute to the formation of a more favorable attitude towards the meaningful use of technology (and OER) in learning. In addition, including concepts associated with critical digital pedagogy in the curricula would help teachers to become aware of the importance of the conscious and responsible use of technology for educational purposes. Decision-makers should recognize that promotion to teaching position is not a predictor of openness to technology and, as a result, professional assessments should consider pedagogical digital skills as a distinct dimension: the results obtained suggest that openness to technology and the intention to integrate it into teaching practice do not occur implicitly and progressively, concurrently with career development. It is also imperative to be aware of the fact that having digital skills does not guarantee their valorization in the teaching process. On the contrary, digital routine and digital multitasking are negatively associated with attitudes towards OER.

From a theoretical point of view, the thesis demonstrates that attitude remains the main element in our research, and this is associated with socio-demographic factors (level of education) and digital behavior (digital routine, digital multitasking and immediate gratification). This aspect suggests that classic models of acceptance of digital technologies and investigation of attitude towards OER should be contextualized according to the educational and institutional specifics, but also to the particularities and predispositions of users.

CONTRIBUTIONS

This research effort was a long one, during which a series of legislative changes took place in the field of education, which required constant updating of the information in the study.

The contributions of our research in the field of knowledge and for the field of teacher training through the integration of open educational resources (OER) are reflected in several

dimensions. At a theoretical level, the novelty of the approach is obvious, since there are no similar studies in our country to date. Another element of originality consists in the inclusion of socio-demographic factors (professional teaching grade and level of education) along with the analysis of the impact of courses for the use of digital technologies, as factors on the attitude towards OER and on the acceptance of digital technologies, even if the results did not confirm a statistically significant relationship in all analyses. At a methodological level, the research involved the translation and adaptation to the Romanian cultural context of internationally validated instruments, such as the ATOER scale and the TAM scale, as well as demonstrating the validity of the DNAS scale. Empirically, the study provides original data about a little-explored group in Romania, - teachers and future teachers for early education -, a niche category in relation to the literature on OER. The study also partially confirms the hypotheses formulated. In practical terms, the results allow the formulation of concrete recommendations for improving the training and professional development offer for teachers, recommendations that can be capitalized on through educational policies or through initiatives of initial and continuous training providers.

Although the results obtained bring valuable contributions, there are some critical aspects that are worth highlighting: the attitudes reported by the participants represent their own perceptions of the characteristics related to their attitude towards OER and openness towards the integration of technology in teaching practice. The declared acceptance of technology or a favorable attitude towards OER does not guarantee the effective integration of technology in teaching practice. When it comes to technology, it is essential to bear in mind that contextual factors (infrastructure, geographical positioning, organizational culture, etc.) must be analyzed in detail and included in the analyses as factors that can be decisive for the adoption of technology. Last but not least, it is necessary for each of the users to have a critical perspective on digitalization, which must be perceived as a means of enriching and streamlining learning, not an end in itself. If there is no integrative approach of technology with pedagogy, technology can only constitute a superficial substitute for educational practices carried out traditionally.

Implications for teacher training

The data obtained highlight the need to design training programs adapted to the specific needs of early childhood education teachers, which would capitalize on open educational

resources as learning tools and pedagogical innovation. The results suggest the importance of introducing modules for the development of digital skills in the initial and continuing education curriculum that would emphasize the importance of the conscious and responsible use of technology for educational purposes. It is also necessary to inform teachers, during training courses or through communications sent by educational institutions, of the undesirable effects of the fragmented and routine use of technology.

Adapting assessment tools (ATOER, DNAS and TAM scales) to the Romanian context allows for more precise monitoring of the level of digital competence and the degree of use of technology/OER. This approach provides decision-makers and training providers with relevant data on which to calibrate educational policies and professional development programs, contributing both to the individual progress of teachers and to the modernization of the education system as a whole.

Research perspectives

Future research could validate the proposed models on more diverse and larger samples. It would be relevant to compare rural and urban contexts, further investigations on age categories and on the completion of ICT courses prior to the study. Of course, the models could be validated by testing them in studies involving educators/teachers from several regions, belonging to a more balanced distribution of age categories, with different experience and level of education. A longitudinal approach would allow for the tracking of changes in attitude and practice over time, taking into account digital transformations, career and educational evolution (level of education).

To understand the relationship between attitudes towards OER, openness to technology use and actual classroom practice, additional qualitative studies (interviews, focus groups) would be extremely useful to help identify teachers' barriers and motivations in adopting technologies. Of course, the two dimensions analyzed in the research from the teachers' perspective also have an impact on the educational environment and students. It would be important to investigate how attitudes towards OER and openness to technology use are reflected in students' learning experience.

New technologies (artificial intelligence, augmented reality, adaptive platforms, etc.) produce different educational contexts. Considering the exponential development of digital technologies, an aspect that deserves to be studied is how teachers relate to innovations in this sphere, how they manage change and how they adapt. It should also be explored whether the factors (influencing attitudes towards RED and openness to technology) identified in this research (level of education and digital habits) remain relevant.

References

1. Adedoyin, O. B., & Altinay, F. (2023). Open educational resources: Evaluation of students' intention to use and motivation to create. British Journal of Educational Technology, 54, 1790–1813. https://doi.org/10.1111/bjet.13313;
2. Afanas, A. (2016). Formarea continuă a profesorului – deziderat al școlii contemporane [Continuing teacher education: An aspiration of contemporary schools]. Univers Pedagogic, 2(50), 92–96. https://ibn.idsi.md/ro/vizualizare_articol/47201;
3. Ajzen, I. (2012). The theory of planned behavior. In P. A. M. Lange, A. W. Kruglanski, & E. T. Higgins (Eds.), Handbook of theories of social psychology (Vol. 1, pp. 438–459). SAGE;
4. Alison. (n.d.). Free online courses & online learning. https://alison.com/;
5. Ambrose, E. S., Ogbomo, E. F., & Akporhonor, B. A. (2024). Awareness, attitudes, skills, and open educational resources usage among open and distance learners. Record and Library Journal, 10(1), 138-150. https://www.researchgate.net/publication/381769139_Awareness_attitudes_skills_and_open_educational_resources_usage_among_open_and_distance_learners;
6. Andrade, A., Ehlers, U.-D., Caine, A., Carneiro, R., Conole, G., Kairamo, A.-K., … Holmberg, C. (2011). Beyond OER: Shifting focus to open educational practices (pp. 1–191), Open Education Quality Initiative. https://www.oerknowledgecloud.org/archive/OPAL2011.pdf;

7. Antonesei, L. (1996). Paideia. Fundamentele culturale ale educației [Paideia: The cultural foundations of education]. Polirom;
8. Autoritatea Națională pentru Calificări (ANC). (n.d.). Standarde ocupaționale [Occupational standards]. http://intern.anc.edu.ro/standarde/standarde_ocupationale/management/uploads/Educator%20puericultor_00.pdf;
9. Beetham, H., Falconer, I., McGill, L., & Littlejohn, A. (2012). Open practices: Briefing paper. JISC. https://oersynth.pbworks.com/w/file/58444186/Open%20Practices%20briefing%20paper.pdf
10. Bell, B.& Gilbert, J. (1996). Teacher Development: A Model From Science Education. Bristol: Falmer Press/Taylor and Francis. https://eric.ed.gov/?id=ED395763;
11. Bell, D. (1976). Welcome to the post-industrial society. Physics today. https://eric.ed.gov/?id=EJ133521;
12. Bissessar, C. S. (2014). Facebook as an Informal Teacher Professional Development Tool. Australian Journal of Teacher Education, 39(2), http://dx.doi.org/10.14221/ajte.2014v39n2.9;
13. Blundell, C. N., Mukherjee, M., & Nykvist, S. (2022). A scoping review of the application of the SAMR model in research. Computers and Education Open. https://www.sciencedirect.com/science/article/pii/S2666557322000210;
14. Bolam, R., et al. (2005). Creating and sustaining effective professional learning communities (Research Report No. 637). London: Department for Education and Skills;
15. Brooks, G.; Burton, M. (2008). European Adult Learning Glossary, Level 1, European Commission;
16. Butler, D., Leahy, M., Hallissy, M., & Brown, M. (2017). Different strokes for different folks: Scaling a blended model of teacher professional learning. Interactive Technology and Smart Education, 14(3), 230–245. https://www.researchgate.net/publication/318751844_Different_strokes_for_different_folks_scaling_a_blended_model_of_teacher_professional_learning;

17. Butnaru, Cristina. (2016). Coordonate actuale privind formarea continuă a cadrelor didactic [Current perspectives on teachers' continuing professional development]. Univers Pedagogic, 2 (50), 97-102;
18. Carrier , L. M., Rosen. L. D., Cheever N. A., Lim A. F. (2015). Causes, effects, and practicalities of everyday multitasking, Developmental Review. https://doi.org/10.1016/j.dr.2014.12.005;
19. Castells, Manuel. (2004). The Network Society. A Cross-cultural Perspective. Edward Elgar Publishing Limited;
20. Comenius, J. A. (1970). Didactica Magna [The great didactic]. Editura Didactică și Pedagogică;
21. Comisia Europeană. (2014). Concluziile Consiliului privind formarea eficace a profesorilor (1) (2014/C 183/05) [Council conclusions on effective teacher education (2014/C 183/05)]. Jurnalul Oficial al Uniunii Europene C183/22-25. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52014XG0614\(05\);
22. Comisia Europeană.(2021b). Plan de acțiune pentru educația digitală (2021-2027). Adaptarea educației și formării la era digitală [Digital education action plan (2021–2027): Adapting education and training to the digital age]. Retrieved from https://ec.europa.eu/education/education-in-the-eu/digital-education-action-plan_ro;
23. Comisia Europeană/EACEA/Eurydice. (2018). Carierele cadrelor didactice în Europa: acces, progres și sprijin [Teaching careers in Europe: Access, progression and support]. Raport Eurydice. Luxemburg: Oficiul pentru Publicații al Uniunii Europene;
24. Comisia Europeană/EACEA/Eurydice.(2013). Date cheie privind cadrele didactice și conducătorii de școli din Europa. Raport Eurydice [Key data on teachers and school leaders in Europe: Eurydice report], Oficiul pentru publicații al Uniunii Europene, Luxemburg. Retrieved from https://op.europa.eu/ro/publication-detail/-/publication/51feca7d-57f6-48c3-99aa-322328e6fff9/language-ro/format-PDF/source-search;
25. Comisia Europeană/EACEA/Eurydice.(2021a). Teachers in Europe. Careers, Development and Well-being, Eurydice Report. Retrieved from

https://eacea.ec.europa.eu/national-policies/eurydice/sites/default/files/teachers_in_europe_2020_chapter_2_0.pdf;

26. Coutinho, C. P., & Lisbôa, E. S. (2013). Social networks as spaces for informal teacher professional development: Challenges and opportunities. International Journal of Web Based Communities, 9(2), 199–211. https://doi.org/10.1504/IJWBC.2013.053244;
27. Creative Commons. (n.d.). When we share, everyone wins. https://creativecommons.org/;
28. Creswell, J. W., & Creswell, J. D. (2018). Research design: Qualitative, quantitative, and mixed methods approaches (5th ed.). SAGE Publications;
29. Cristea, S. (2010). Fundamentele pedagogiei [Foundations of pedagogy]. Polirom;
30. Cronin, C. (2017). Openness and praxis: Exploring the use of open educational practices in higher education. International Review of Research in Open and Distributed Learning, 18(5), 15–34. https://doi.org/10.19173/irrodl.v18i5.3096;
31. Cronin, C., & MacLaren, I. (2018). Conceptualising OEP: A review of theoretical and empirical literature in open educational practices. Open Praxis, 10(2), 127–143. https://doi.org/10.5944/openpraxis.10.2.825;
32. Cuciureanu, G., et al. (2015). Tipuri de rezultate științifice ale proiectelor de cercetare (proiect pentru o discuție publică) [Types of scientific outputs from research projects (draft for public discussion)]. Akademos, 36(3), 48–50;
33. Darling-Hammond, L., & McLaughlin, M. W. (1995). Policies that support professional development in an era of reform. Phi Delta Kappan, 76(8), 597–604;
34. Darwish, H. (2019). Open educational resources (OER) edupreneurship business models for different stakeholders. Education and Information Technologies, 24(4), 2821–2839. https://www.researchgate.net/publication/334366893_Open_educational_resources_OER_Edupreneurship_business_models_for_different_stakeholders;
35. Das, A. (2011). Emergence of open educational resources (OER) in India and its impact on lifelong learning. Library Hi Tech News, 28(5), 10–15. https://doi.org/10.1108/07419051111163848;

36. Dave, R. H. (1973). Lifelong education and school curriculum: Interim findings of an exploratory study on school curriculum, structures and teacher education in the perspective of lifelong education. UNESCO Institute for Education;
37. Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly, 13(3), 319–340. https://doi.org/10.2307/249008;
38. de los Arcos, B., Farrow, R., Perryman, L.-A., Pitt, R., & Weller, M. (2014). OER evidence report 2013–2014. OER Research Hub;
39. Diac, G. (2009). Personalitatea cadrului didactic [The teacher's personality]. In C. Cucoș (Ed.), Psihopedagogie pentru examenele de definitivare și grade didactice (pp. 221–236). Polirom;
40. Diaconu, M. (2002). Competențele profesiei didactice [Competencies of the teaching profession]. In L. Gliga (Ed.), Standarde profesionale pentru profesia didactică (pp. 45–62). Consiliul Național pentru Pregătirea Profesorilor;
41. Downes, S. (2007). Models for sustainable open educational resources. Interdisciplinary Journal of Knowledge and Learning Objects, 3, 29–44. https://doi.org/10.28945/384;
42. Ehlers, U.-D. (2011). From open educational resources to open educational practices. eLearning Papers, 23, 1–8. https://oerknowledgecloud.org/sites/oerknowledgecloud.org/files/media23305.pdf;
43. Ehlers, U.-D., & Conole, G. (2010, May). Open educational practices: Unleashing the power of OER. Paper presented at UNESCO Workshop on OER in Namibia 2010, Windhoek, Namibia. https://www.oerknowledgecloud.org/archive/OEP_Unleashing-the-power-of-OER.pdf ;
44. Eurydice. (2021). Formarea inițială a cadrelor didactice din educația timpurie și învățământul preuniversitar [Initial teacher education in early childhood and pre-university education]. https://education.ec.europa.eu/eurydice;
45. Fraser, C., Kennedy, A., Reid, L., & McKinney, S. (2007). Teachers' continuing professional development: Contested concepts, understandings and models. Journal of In-Service Education, 33(2), 153–169. https://doi.org/10.1080/13674580701292913;

46. Geser, G. (2007a). Open educational practices and resources: OLCOS roadmap 2012. Salzburg, Austria: Salzburg Research/EduMedia Group. https://www.olcos.org/cms/upload/docs/olcos_roadmap.pdf;
47. Getenet, S., Cantle, R., Redmond, P., & Albion, P. (2024). Students' digital technology attitude, literacy and self-efficacy and their effect on online learning engagement. International Journal of Educational Technology in Higher Education, 21(7). https://doi.org/10.1186/s41239-023-00437-y;
48. Gliga, L. (Ed.). (2002). Standarde profesionale pentru profesia didactică [Professional standards for the teaching profession]. Consiliul Național pentru Pregătirea Profesorilor, MEC;
49. Grimus, M. (2020). Emerging technologies: Impacting learning, pedagogy and curriculum development. In M. A. Peters, R. Heraud, & P. Jandrić (Eds.), Emerging technologies and pedagogies in the curriculum (pp. 127–152). Springer. https://doi.org/10.1007/978-981-15-0618-5_8;
50. Guvernul României. (2025). Ordonanță de urgență nr. 27 din 16 aprilie 2025 pentru aprobarea Cadrului de competențe digitale pentru cetățenii României [Emergency Ordinance No. 27 of 16 April 2025 approving the digital competence framework for Romanian citizens], publicat în Monitorul Oficial nr. 353 din 22 aprilie 2025. https://legislatie.just.ro/Public/DetaliiDocument/296812;
51. Hairon, S., Goh, J. W. P., Chua, C. S. K., & Wang, L. (2015). A research agenda for professional learning communities: Moving forward. Professional Development in Education, 41(1), 1–16. https://www.researchgate.net/publication/282802109_A_research_agenda_for_professional_learning_communities_moving_forward;
52. Hattie, J. (2014). Învățarea vizibilă: Ghid pentru profesori [Visible learning: A guide for teachers]. Editura Trei;
53. Hegarty, B. (2015). Attributes of open pedagogy: A model for using open educational resources. Educational Technology, 55(4), 3–13. https://www.researchgate.net/publication/281286900_Attributes_of_Open_Pedagogy_A_Model_for_Using_Open_Educational_Resources;

54. Herivan, M. (1976). Educația la timpul viitor [Education in the future tense]. Editura Albatros;
55. Hilton, J. L., & Wiley, D. (2018). Defining OER-enabled pedagogy. The International Review of Research in Open and Distributed Learning, 19(4), 133–147. https://doi.org/10.19173/irrodl.v19i4.3601;
56. Hodgkinson-Williams, C. (2014, May). Degrees of ease: Adoption of OER, open textbooks and MOOCs in the Global South. Paper presented at 2nd Regional Symposium on Open Educational Resources: Beyond Advocacy, Research and Policy, Penang, Malaysia. https://open.uct.ac.za/items/79d2b560-3ddd-46e3-9e5f-5d17eb811a70;
57. Ilomäki, L., Paavola, S., Lakkala, M., Kantosalo, A. (2016). Digital competence-an emergent boundary concept for policy and educational research. Education and Information Technologies, 21(3), pp 655-679. https://doi.org/10.1007/s10639-014-9346-4;
58. Isin, E., & Ruppert, E. (2020). Being digital citizens (2nd ed.). Rowman & Littlefield International;
59. Issa, A. I., Ibrahim, M. A., Onojah, A. O., & Onojah, A. A. (2020). Undergraduates' attitude towards the utilization of open educational resources for learning. International Journal of Technology in Education and Science (IJTES), 4(3), 227–234. https://www.researchgate.net/publication/342446289_Undergraduates'_Attitude_towards_the_Utilization_of_Open_Educational_Resources_for_Learning;
60. Istrate, O. (2000). Educația la distanță: Proiectarea materialelor [Distance education: Designing learning materials]. Editura Agata;
61. Istrate, O. (2022). Pedagogia digitală: Definiție și arie conceptuală [Digital pedagogy: Definition and conceptual scope]. Revista de Pedagogie Digitală, 1(1), 3–10. https://doi.org/10.61071/RPD.2290;
62. James, R., & Bossu, C. (2014). Conversations from south of the equator: Challenges and opportunities in OER across broader Oceania. RUSC. Universities and Knowledge Society Journal, 11(3), 78–90. https://doi.org/10.7238/rusc.v11i3.2220;

63. JISC. (2020). Exploring the digital pedagogy toolkit. https\://www\.jisc.ac.uk/guides/exploring-the-digital-pedagogy-toolkit;
64. Kasinathan, G. & Ranganathan, S. (2017). Teacher professional learning communities: A collaborative OER adoption approach in Karnataka, India. In C. Hodgkinson-Williams & P. B. Arinto (Eds.), Adoption and impact of OER in the Global South (pp. 499–548). Retrieved from https://doi.org/10.5281/zenodo.601180;
65. Kelly, J. A. (2002). Drumul către standardele predării [The path towards teaching standards]. In L. Gliga (Ed.), Standarde profesionale pentru profesia didactică (pp. 63–78). Consiliul Național pentru Pregătirea Profesorilor;
66. Kennedy, A. (2005). Models of continuing professional development: A framework for analysis. Journal of In-Service Education, 31(2), 235–250. https://doi.org/10.1080/13674580500200277;
67. Khlaif, Z. N., Sanmugam, M., Joma, A. I., Odeh, A., & Barham, K. (2023). Factors influencing teacher's technostress experienced in using emerging technology: A qualitative study. Technology, Knowledge and Learning, 28(2), 865–899. https://doi.org/10.1007/s10758-022-09607-9;
68. Kim, B. W., Lee, W. G., Lee, B. R., & Shon, J. G. (2015). Influencing factors in OER usage of adult learners in Korea. The International Review of Research in Open and Distributed Learning, 16(2), 1–17. https://doi.org/10.19173/irrodl.v16i2.2051;
69. Lane, A. (2013). The social and economic impacts of open education. In R. McGreal, W. Kinuthia, & S. Marshall (Eds.), Openness and education (Advances in Digital Education and Lifelong Learning, Vol. 1, pp. 137–172). Emerald Group Publishing. https://doi.org/10.1108/S2051-2295\(2013\0000000006);
70. Leland, A. O., Cooper, J. H., & Harder, H. L. (1984). Teacher development: Learning experience framework for teacher candidates. Teacher Education Quarterly, 11(3), 115–125. http://www.jstor.org/stable/24673695;
71. Li, M., Vale, C., Tan, H., & Zhang, Y. (2025). Factors influencing the use of digital technologies in primary mathematics teaching: Voices from Chinese educators. Education and Information Technologies, 30, 12573–12608. https://doi.org/10.1007/s10639-024-13309-3;

72. Lin, Y., & Yu, Z. (2023). Extending technology acceptance model to higher-education students' use of digital academic reading tools on computers. International Journal of Educational Technology in Higher Education, 20(34). https://doi.org/10.1186/s41239-023-00403-8;
73. Macià, M., & García, I. (2016). Informal online communities and networks as a source of teacher professional development: A review. Teaching and Teacher Education, 55, 291–307. https://doi.org/10.1016/j.tate.2016.01.021;
74. Martin, D. P., Coles, S., & Wang, C. (2020). Examining higher education faculty use of current digital technologies: Importance, competence, and motivation. International Journal of Teaching and Learning in Higher Education, 32(1), 73–86. https://isetl.org/ijtlhe/pdf/IJTLHE3653.pdf;
75. Martin, F. et al. (2025). Digital distractions in education: A systematic review of research on causes, consequences and prevention strategies. Educational Technology Research and Development. https://doi.org/10.1007/s11423-025-10550-6;
76. Masterman, L., Wild, J., White, D., & Manton, M. (2011). The impact of OER on teaching and learning in UK universities: Implications for learning design. In Proceedings of the 6th International LAMS & Learning Design Conference 2011: Learning design for a changing world (pp. 135–144). Sydney: LAMS Foundation;
77. MEC. (2025, mai 21). ORDIN nr. 3.986 din 5 mai 2025 pentru aprobarea Metodologiei-cadru privind tipul programelor pentru dezvoltare în cariera didactică, asigurarea calității programelor și sistemul de acumulare a creditelor ECTS pentru cadrele didactice din învățământul preuniversitar [Order No. 3986 of 5 May 2025 approving the framework methodology for teacher career development programmes, programme quality assurance and the ECTS credit accumulation system for pre-university teachers];
78. Ministerul Cercetării, Inovării și Digitalizării. (2024). Planul național de acțiune privind deceniul digital pentru România [National action plan for Romania's Digital Decade]. https://www.mcid.gov.ro/wp-content/uploads/2024/04/Plan-national-de-actiune-road map-pentru-publicare.pdf;

79. Ministerul Educației și Cercetării. (2011). Legea educației naționale nr.1/2011 cu modificările și completările ulterioare [National Education Law No. 1/2011, as subsequently amended and supplemented]. Retrieved from https://edu.ro/sites/default/files/_fi%C8%99iere/Legislatie/2020/LEN_actualizata_octombrie_2020.pdf;
80. Ministerul Educației și Cercetării. (2011). OMECTS nr. 5561/7.10.2011, Metodologia privind formarea continuă a personalului din învăţământul preuniversitar [Order No. 5561/7 October 2011: Methodology for continuing professional development of pre-university education staff]. https://www.edu.ro/sites/default/files/_fi%C8%99iere/Invatamant-Preuniversitar/2016/resurse%20umane/formarea%20continua/OM%205561_2011%20Metodologie%20privind%20formarea%20continu%C4%83%20a%20personalului%20din%20%C3%AEnv%20preuniv.pdf;
81. Ministerul Educației și Cercetării. (2016). Anexa 1 la OMENCȘ nr. 4476/06.07.2016, Standard profesional de formare continuă pentru funcția didactică de predare profesor pentru învățământ preșcolar – gradul didactic II [Annex 1 to Order No. 4476/2016: Continuing professional development standard for preschool teachers – Teaching Grade II]. Ministerul Educației și Cercetării. https://www.edu.ro/formare-continua;
82. Ministerul Educației și Cercetării. (2016). Anexa 2 la OMENCȘ nr. 4476/06.07.2016, Standard profesional de formare continuă pentru funcția didactică de predare profesor pentru învățământ preșcolar – gradul didactic I [Annex 2 to Order No. 4476/2016: Continuing professional development standard for preschool teachers – Teaching Grade I]. Ministerul Educației și Cercetării. Retrieved on 28.05.2022, de pe https://www.edu.ro/formare-continua;
83. Ministerul Educației și Cercetării. (2016). Anexa 3 la OMENCȘ nr. 4476/06.07.2016, Standard profesional de formare continuă pentru funcția didactică de predare profesor pentru învățământ preșcolar – formare continuă o dată la 5 ani [Annex 3 to Order No. 4476/2016: Continuing professional development standard for preschool teachers – Training once every five years]. Ministerul Educației și Cercetării. Retrieved on 28.05.2022, de pe https\://www\.edu.ro/formare-continua;

84. Ministerul Educației și Cercetării. (2016). OMENCȘ nr. 4476/2016 privind aprobarea standardelor profesionale de formare continuă pentru funcția didactică de predare profesor din învățământul preuniversitar, pe niveluri de învățământ - preșcolar, primar, gimnazial și liceal - și pe etape de dezvoltare profesională din cariera didactică - gradul didactic II, gradul didactic I, formare continuă o dată la 5 ani [Order No. 4476/2016 approving continuing professional development standards for pre-university teachers by educational level and career stage], publicat în Monitorul Oficial al României, partea I, nr. 31/11.01.2017. Retrieved from https://www.edu.ro/formare-continua;
85. Ministerul Educației și Cercetării. (2017). Nota nr. 808/03.11.2017 Privind crearea rețelei de resurse educaționale deschise în cadrul inspectoratelor școlare județene [Notice No. 808/3 November 2017 on establishing an open educational resources network within county school inspectorates]. https://edu.ro/nota-ministerului-educa%C8%9Biei-na%C8%9Bionale-privind-crearea-re%C8%9Belei-de-resurse-educa%C8%9Bionale-deschise-%C3%AEn;
86. Ministerul Educației și Cercetării. (2020). OMEC Nr. 4247/2020 din 13 mai 2020 pentru modificarea şi completarea Metodologiei de evaluare anuală a activităţii personalului didactic şi didactic auxiliar, aprobată prin Ordinul ministrului educaţiei, cercetării, tineretului şi sportului nr. 6.143/2011 [Order No. 4247/2020 amending the methodology for annual evaluation of teaching and auxiliary teaching staff]. Retrieved from https://www.edu.ro/sites/default/files/_fi%C8%99iere/Legislatie/2020/ordin%20nr.%204247_13.05.2020%20modificare%20%2B%20completare%20Metodologie%20evaluare%20anuala%20activitate%20cadre%20didactice.pdf;
87. Ministerul Educației și Cercetării. (2020). Ordin nr. 4135 privind aprobarea instrucțiunii pentru crearea și/sau întărirea capacității sistemului de învățământ preuniversitar prin învățare on-line [Order No. 4135 approving instructions for developing and strengthening the capacity of pre-university education through online learning];
88. Ministerul Educației și Cercetării. (2022). Anexă la Ordinul ministrului educaţiei nr. 3551/07.04.2022 Metodologia şi criteriile privind acordarea gradaţiei de merit

personalului didactic din învăţământul preuniversitar de stat în sesiunea 2022 (Anexa 7) [Annex to Order No. 3551/2022: Methodology and criteria for awarding merit-based salary increments to state pre-university teachers in 2022]. https://www.edu.ro/sites/default/files/_fi%C8%99iere/Legislatie/2022/Metodologie_gradatie_merit%20_2022.pdf;

89. Ministerul Educației și Cercetării. (2023). Legea educației naționale nr.1/2011 [National Education Law No. 1/2011]. https://www.edu.ro;
90. Ministerul Educației și Cercetării. (2023). Legea învățământului preuniversitar nr.198/5.07.2023 [Pre-University Education Law No. 198/5 July 2023]. Retrieved on 31 martie 2025, de pe https://edu.ro/sites/default/files/_fi%C8%99iere/Minister/2023/Legi_educatie_Romania_educata/legi_monitor/Legea_invatamantului_preuniversitar_nr_198.pdf;
91. Ministerul Educației și Cercetării. (2024). Ordin nr. 7386/11.11.2024 pentru aprobarea Profilului și standardelor profesionale ale cadrului didactic din învățământul preuniversitar, pe etape de carieră și pe niveluri de învățământ [Profile and professional standards for pre-university teachers by career stage and education level]. https://www.edu.ro/profil_standarde_profesionale_cadru_didactic;
92. Ministerul Educației și Cercetării. (2024). Ordin nr. 7422 din 19.11.2024 pentru aprobarea Metodologiei de asigurare a omologării mijloacelor de învățământ [Order No. 7422 of 19 November 2024 approving the methodology for certifying teaching aids]. http://ismb.edu.ro/documente/diverse/2025/Ordin_ME_nr_7442_din_19_11_2024.pdf ;
93. Ministerul Educației și Cercetării. (2024). Ordin nr. 7841/20.12.2024 pentru aprobarea Metodologiei privind înființarea programelor de studii universitare de licență ”Educație timpurie” [Methodology for establishing bachelor’s degree programmes in early childhood education]. https://www.edu.ro/sites/default/files/fisiere%20articole/OM_7841-2024.pdf;
94. Ministerul Educației și Cercetării. (2025). Consultare publică 31.01 – 06.03.2025: Proiectele planurilor-cadru pentru învățământul liceal, frecvență zi [Public consultation, 31 January–6 March 2025: Draft framework curricula for full-time

upper secondary education]. https://www.edu.ro/sites/default/files/_fi%C8%99iere/Minister/2025/div/Cons_pub_Proiecte_Planuri_cadru_Liceu_zi.pdf;

95. Ministerul Educației și Cercetării. (2025). Ordin nr. 3.745/2025 pentru aprobarea Metodologiei și criteriilor privind acordarea gradației de merit personalului didactic din învățământul preuniversitar de stat în sesiunea 2025 [Methodology and criteria for awarding merit-based salary increments to state pre-university teachers in 2025] (Anexa 7), publicat în Monitorul Oficial al României, Partea I, Nr. 322 bis/11.IV.2025. https://www.edu.ro/sites/default/files/_fi%C8%99iere/Legislatie/2025/OMEC_3745_2025_Gradatie_merit.pdf;
96. Ministerul Educației, Anexa la Ordinul ministrului educației nr. 4.150/2022 pentru aprobarea cadrului de competențe digitale al profesionistului din educație [Annex to Order No. 4150/2022 approving the digital competence framework for education professionals], publicat în Monitorul Oficial nr. 700 bis din 13 iulie 2022. https://www.upt.ro/img/files/legislatie/2022/OME_4150_29.06.2022_aprobare_cadru_de_competente_digitale.pdf;
97. Ministerul Educației, Cercetării, Tineretului și Sportului. (2011). Ordin nr. 5347/7.09.2011 privind aprobarea planurilor-cadru de învățământ pentru clasele a IX-a – a XII-a, filiera vocațională, profil [Order No. 5347/2011 approving framework curricula for grades 9–12, vocational track, pedagogical specialisation] pedagogic. https://rocnee.eu/images/rocnee/fisiere/planuri-cadru/liceal/OMECTS%20nr.%205347_2011%20privind%20aprobarea%20planurilor-cadru%20de%20inv.%20pentru%20cls.%20a-IX-a%20-%20a%20XII-a_%20filiera%20vocationala_profil%20pedagogic.pdf;
98. Ministerul Educației. (2023). Ordin nr. 3670 pentru modificarea Ordinului ministerului educației și sportului nr. 5347/2011 privind aprobarea planurilor-cadru de învățământ pentru clasele a IX-a – a XII-a, filiera vocațională, profil pedagogic [Order No. 3670 amending Order No. 5347/2011 on framework curricula for grades 9–12, vocational track, pedagogical specialisation].

https://cdn.edupedu.ro/wp-content/uploads/2023/03/planuri-cadru_filiera-vocationala_profilul-pedagogic.pdf;

99. Ministerul Educației. (n.d.). Formare continuă [Continuing professional development]. https://www.edu.ro/formare-continua;

100. Ministerul Educației. (n.d.). Legea educației naționale nr. 1/2011 [National Education Law No. 1/2011]. https://www.edu.ro;

101. Mishra, S., Sharma, M., Sharma, R. C., Singh, A., & Thakur, A. (2016). Development of a scale to measure faculty attitude towards open educational resources. Open Praxis, 8(1), 55–69. https://openpraxis.org/articles/10.5944/openpraxis.8.1.236;

102. Misra, P. K. (2014). Online training of teachers using OER: Promises and potential strategies. Open Praxis, 6(4), 375–385. https://openpraxis.org/articles/312/files/submission/proof/312-1-981-1-10-20211014.pdf;

103. Montebello, M. (2017, December). Digital pedagogies for teachers' CPD [Conference presentation]. IADIS International Conference on Educational Technologies, Sydney, Australia;

104. Națiunile Unite. (2006). Convenția privind drepturile persoanelor cu dizabilități [Convention on the Rights of Persons with Disabilities]. http://anpd.gov.ro/web/conventia/;

105. OECD, (2012), New sources of growth. Knowledge-based capital driving investment and productivity in the 21st century. Interim project findings, mai 2012. Retrieved from http://oe.cd/kbc;

106. Opariuc-Dan, C. (2011). Analiza relațiilor și a diferențelor statistice [Analysis of statistical relationships and differences]. Editura Arhip Art;

107. Otto, D. (2021). Driven by emotions! The effect of attitudes on intention and behaviour regarding open educational resources (OER). Journal of Interactive Media in Education, 2021(1), 1–14. https://doi.org/10.5334/jime.606;

108. Paskevicius, M., & Irvine, V. (2019). Open education and learning design: Open pedagogy in praxis. Journal of Interactive Media in Education, 2019(1), Article 10. https://doi.org/10.5334/jime.512;

109. Păun, E. (2002). Profesionalizarea activității didactice [Professionalisation of teaching]. In L. Gliga (Ed.), Standarde profesionale pentru profesia didactică (pp. 79–95). Consiliul Național pentru Pregătirea Profesorilor;
110. Păun, E. (2017). Pedagogie: Provocări și dileme privind școala și profesia didactică [Pedagogy: Challenges and dilemmas concerning school and the teaching profession]. Polirom;
111. Petko, D., Mishra, P., & Koehler, M. (2025). TPACK in context: An updated model. Computers and Education Open, 8, 100244. https://doi.org/10.1016/j.caeo.2025.100244;
112. Petrides, L., Jimes, C., Middleton-Detzner, C., & Howell, H. (2010). OER as a model for enhanced teaching and learning. In Open ED 2010 Proceedings. Barcelona: UOC, OU, BYU;
113. Prensky, M. (2001). Digital natives, digital immigrants. On the Horizon, 9(5), 1–6. https://doi.org/10.1108/10748120110424816;
114. Ramirez-Montoya, M. S., Mena, J., & García-Peñalvo, F. J. (2017). In-service teachers' self-perceptions of digital competence and OER use as determined by a xMOOC training course. Computers in Human Behavior, 77, 356–364. https://doi.org/10.1016/j.chb.2017.09.010;
115. Ravenscroft, A., Schmidt, A., Cook, J., & Bradley, C. (2012). Designing social media for informal learning and knowledge maturing in the digital workplace. Journal of Computer Assisted Learning, 28(3), 225–239. https://doi.org/10.1111/j.1365-2729.2012.00485.x;
116. Redecker, C. (2017). European framework for the digital competence of educators: DigCompEdu. Publications Office of the European Union;
117. Ribeiro, J. F. (2021). The relationship between instant gratification and actual social media use (Master's thesis, Tilburg University). Tilburg School of Humanities and Digital Sciences;
118. Rutherford, C. (2010). Facebook as a source of informal teacher professional development. In education, 16(1). https://doi.org/10.37119/ojs2010.v16i1.76;
119. Sáenz, M. P., Hernandez, U., & Hernández, Y. M. (2017). Co-creation of OER by teachers and teacher educators in Colombia. In C. Hodgkinson-Williams & P. B.

Arinto (Eds.), Adoption and impact of OER in the Global South (pp. 143–185). African Minds. https://doi.org/10.5281/zenodo.604384;

120. Sailin, S., & Mahmor, N. (2018). Improving student teachers' digital pedagogy through meaningful learning activities. Malaysian Journal of Learning and Instruction, 15(2), 143–173;

121. Senge, P., Cambron-McCabe, N., Lucas, T., Smith, B., Dutton, J., & Kleiner, A. (2016). Școli care învață: A cincea disciplină în educație [Schools that learn: The fifthdiscipline in education]. Editura Trei;

122. Serin, H., & Bozdağ, F. (2020). Relationship between teachers' attitudes towards technology use in education and autonomy behaviors. TOJET: The Turkish Online Journal of Educational Technology, 19(3), 25–35;

123. Sfard, A. (1998). On two metaphors for learning and the danger of choosing just one. Educational Researcher, 27(2), 4–13. https://doi.org/10.3102/0013189X027002004;

124. Stan, L. (2019). Profilul de competențe al educatorului-puericultor [Competency profile of the early childhood educator]. Didactica Pro… Revistă de teorie și practică educațională, 4–5(116–117), 45–52;

125. Stehr, N. (2007). Societal transformations, globalisation and the knowledge society. International Journal of Knowledge and Learning, 3(2–3), 121–137. https://www.researchgate.net/publication/220428385_Stehr_Nico_Societal_transformations_globalisation_and_the_knowledge_society_International_Journal_of_Knowledge_and_Learning_3139-153_2007;

126. Steliac, N., Pop, V., & Moisuc, D.-A. (2012). The knowledge society and the information society: The current situation in Romania. Revista Economică, Supliment 1, 341–348. Universitatea „Lucian Blaga" din Sibiu;

127. Stolovitch, H. D., & Keeps, E. J., cu contribuția lui Rosenberg, M. J. (2017). Formarea prin transformare [Training through transformation]. Editura Trei;

128. Șerbănescu, L. (2011). Formarea profesională a cadrelor didactice – repere pentru managementul carierei [Teacher professional development: Guidelines for career management]. Editura Printech;

129. Șerbănescu, L., Bocoș, M.-D., & Ioja, I. (2020). Managementul programelor de formare continuă a cadrelor didactice: Ghid practic [Management of continuing teacher education programmes: A practical guide]. Polirom;
130. Tang, H., Lin, Y.-J., & Qian, Y. (2021). Improving K-12 teachers' acceptance of open educational resources by open educational practices: A mixed methods inquiry. Educational Technology Research and Development, 69, 3209–3232. https://doi.org/10.1007/s11423-021-10046-z;
131. Teo, T. (2013). An initial development and validation of a Digital Natives Assessment Scale (DNAS). Computers and Education, 67, 51–57. https://doi.org/10.1016/j.compedu.2013.02.012;
132. Teo, T., Ursavaş, Ö. F., & Bahçekapili, E. (2014). Exploring digital natives among pre-service teachers in Turkey: A cross-cultural validation of the Digital Native Assessment Scale. Interactive Learning Environments, 24(7), 1231–1244. https://doi.org/10.1080/10494820.2014.980275;
133. The jamovi project (2025). jamovi (Version 2.6) [Computer Software]. https://www.jamovi.org;
134. Thrun, S. (2013, iunie 3). Sebastian Thrun: Thoughts and financial transparency on our Masters in Computer Science with Georgia Tech. Udacity Blog. https://www.udacity.com/blog/2013/06/sebastian-thrun-thoughts-and-financial.html;
135. Tondeur, J., van Braak, J., Ertmer, P., & Ottenbreit-Leftwich, A. (2017). Understanding the relationship between teachers' pedagogical beliefs and technology use in education: A systematic review of qualitative evidence. Educational Technology Research and Development, 65(3), 555–575. https://doi.org/10.1007/s11423-016-9481-2;
136. Tu, C.-H. (2012). The integration of personal learning environments & open network learning environments. TechTrends, 56(3), 13–19. https://doi.org/10.1007/s11528-012-0571-7;
137. UNESCO, (2017), Second World OER Congress. Ljubljana OER Action Plan. https://en.unesco.org/sites/default/files/ljubljana_oer_action_plan_2017.pdf;

138. UNESCO. (2002). Forum on the impact of open courseware for higher education in developing countries: Final report. Paris. Retrieved from: https://unesdoc.unesco.org/ark:/48223/pf0000128515;
139. UNESCO. (2012), 2012 Paris OER Declaration, The World OER Congress;
140. UNESCO. (n.d.). World OER Congress. https://www.oercongress.org/;
141. Väätäjä, J. O., & Ruokamo, H. (2021). Conceptualizing dimensions and a model for digital pedagogy. Journal of Pacific Rim Psychology, 15, 1–12. https://doi.org/10.1177/1834490921995395;
142. Van Allen, J., & Katz, S. (2019). Developing open practices in teacher education: An example of integrating OER and developing renewable assignments. Open Praxis, 11(3), 311–319. https://openpraxis.org/articles/10.5944/openpraxis.11.3.972;
143. Venkatesh, V., & Bala, H. (2008). Technology Acceptance Model 3 and a research agenda on interventions. Decision Sciences, 39(2), 273–315. https://doi.org/10.1111/j.1540-5915.2008.00192.x;
144. Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. Management Science, 46(2), 186–204. https://doi.org/10.1287/mnsc.46.2.186.11926;
145. Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. MIS Quarterly, 27(3), 425–478. https://doi.org/10.2307/30036540;
146. Vescio, V., Ross, D., & Adams, A. (2008). A review of research on the impact of professional learning communities on teaching practice and student learning. Teaching and Teacher Education, 24(1), 80–91. https://doi.org/10.1016/j.tate.2007.01.004;
147. Virtual Library. (n.d.). Digital citizenship. https://www.virtuallibrary.info/digital-citizenship.html;
148. Watkins, K. E., & Marsick, V. J. (1992). Towards a theory of informal and incidental learning in organizations. International Journal of Lifelong Education, 11(4), 287–300. https://doi.org/10.1080/0260137920110403;
149. Wegner, E., & Nükles, M. (2013). Knowledge acquisition or participation in communities of practice? Academics' metaphors of teaching and learning at the

university. Studies in Higher Education, 38(7), 1070–1089. https://www.researchgate.net/publication/262600819_Knowledge_acquisition_or_participation_in_communities_of_practice_Academics'_metaphors_of_teaching_and_learning_at_the_university;

150. Wiley, D. (2017, mai 2). OER-enabled pedagogy. Open Content Blog. https://opencontent.org/blog/archives/5009;

151. Wolfenden, F. (2008). The TESSA OER experience: Building sustainable models of production and user implementation. Journal of Interactive Media in Education, 2008(3), 1–14. https://doi.org/10.5334/2008-3;

152. Wood, E., Zivcakova, L., Gentile, P., Archer, K., De Pasquale, D., & Nosko, A. (2012). Examining the impact of off-task multi-tasking with technology on real-time classroom learning. Computers & Education, 58(1), 365–374. https://doi.org/10.1016/j.compedu.2011.08.029;

153. World Summit of the Information Society (WSIS). (2003). Declaration of Principles Building the Information Society: a global challenge in the new Millennium, Geneva. Retrieved from https://www.itu.int/net/wsis/docs/geneva/official/dop.html;

154. Yeh, Y. (2010). Integrating collaborative PBL with blended learning to explore preservice teachers' development of online communities. Computers & Education, 54(2), 791–802. https://www.researchgate.net/publication/229360671_Integrating_collaborative_PBL_with_blended_learning_to_explore_preservice_teachers'_development_of_online_learning_communities;

155. Yu, C. H., Brewer, L., Jannasch-Pennell, A., DiGangi, S., & Kaprolet, C. (2009, aprilie). Adopting Web 2.0 for instruction: The effects of faculty rank and employment status. Paper presented at Annual Meeting of the American Educational Research Association (AERA), San Diego, CA. https://www.creative-wisdom.com/pub/AERA2009_presentation_rank_adoption.pdf;

156. Zamri, M., & Mohamad, S. N. A. (2025). Technology integration in education: A review and analysis of SAMR model. International Journal of Research and

Innovation in Social Science, 8(3), 6195–6200. https://doi.org/10.47772/IJRISS.2024.803463S;

157. Zhang, J., & Patel, V. (2006). Distributed cognition, representation, and affordance. Pragmatics & Cognition, 14(2), 333–341. https://www.researchgate.net/publication/233503192_Distributed_cognition_representation_and_affordance.