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RESEARCH ARTICLE

A BLENDED LEARNING MODEL SUPPORTED BY A WEB-BASED PLATFORM FOR THE PRACTICAL TRAINING OF TECHNOLOGY AND ENTREPRENEURSHIP TEACHERS

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Abstract

Digital transformation in higher education has significantly reshaped the organization of teacher education, creating a need for innovative pedagogical models that effectively integrate face-to-face and online learning environments. As a core component of teacher education, practical training requires new organizational approaches that facilitate collaboration among university lecturers, mentor teachers, and student teachers, while also supporting the development of professional, methodological, digital, and reflective competencies. This study propos es a blended learning model supported by a purpose-built web-based platform designed for the practical training of future Technology and Entrepreneurship teachers. The proposed model combines theoretical preparation, practical learning activities, digital educational resources, communication, mentoring, assessment, and professional reflection within a unified digital environment. The study concentrates on usabilit y, communication, the organization of the teaching practicum, access to educational resources, the quality of feedback, and support for the development of professional competencies. The results indicate that integrating a specialized web-based platform into a structured blended learning model improves the organization and management of the teaching practicum, facilitates continuous interaction among participant s, enhances access to methodological resources, and supports reflective learning and competency development. The proposed model provides an effective framework for linking university-based preparation with school-based practice and may be adapted for implementation in other teacher education programs.

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Introduction:-

Over the past decade, digital transformation has become a major driver of educational development, fundamentally reshaping teaching and learning at all levels of education. The expansion of digital infrastructure, the extensive use of digital educational resources, and the emerging needs of contemporary society have created new requirements for organizing educational processes. These changes are particularly evident in higher education, where digital learning

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environments, online communication, and innovative forms of interaction between lecturers and students increasingly complement traditional face-to-face instruction. In this context, the effective preparation of future teachers is essential for the sustainable implementation of digital transformation in school education.

The need for such transformation is explicitly reflected in European educational policy. The Digital Education Action Plan (2021–2027) identifies the development of a high-performing digital education ecosystem and the enhancement of digital competencies among all participants in education as two strategic priorities (European Commission, 2021). Similarly, the Council Recommendation on the key enabling factors for successful digital education and training spotlights the importance of the sustainable integration of digital technologies into teaching, the development of institutional capacity, and the implementation of innovative pedagogical approaches (Council of the European Union, 2023). These strategic documents regard digital technologies not as an end in themselves but as a means of improving educational quality, strengthening collaboration, and increasing the effectiveness of teaching and learning.

These European priorities are also reflected in the Strategic Framework for the Development of Education, Training and Learning in the Republic of Bulgaria (2021–2030), which identifies digital transformation as a key priority for modernizing the national education system. The framework emphasizes the development of teachers' digital competencies, the implementation of innovative teaching models, and the effective use of digital technologies to advance educational quality. Consequently, higher education institutions are expected to prepare future teachers who can integrate digital technologies into both their own learning and their future professional practice in pedagogically meaningful ways.

Teaching practicum constitutes a fundamental component of teacher education because it enables student teachers to transform theoretical knowledge into professional practice within authentic school environments. During the practicum, students observe classroom instruction, design and deliver lessons, interact with pupils, critically reflect on their own teaching, and gradually develop their professional identity. The effectiveness of this process depends not only on the quality of university-based preparation but also on effective collaboration among student teachers, mentor teachers, and university lecturers, as well as on opportunities for timely feedback, professional reflection, and continuous monitoring of individual progress.

The preparation of future Technology and Entrepreneurship teachers has distinctive characteristics resulting from the practice-oriented nature of the subject area. In addition to acquiring pedagogical and methodological knowledge, student teachers are expected to develop competencies in designing and implementing practical learning activities, applying digital technologies, integrating STEM approaches, organizing project-based learning, and fostering entrepreneurial competencies. This requires a learning environment that effectively connects methodological preparation with authentic teaching practice while promoting active collaboration among all participants involved in the teaching practicum.

In recent years, blended learning has emerged as one of the most promising approaches to organizing higher education. Rather than representing a simple combination of face-to-face and online instruction, blended learning involves the pedagogically meaningful integration of different learning environments, ensuring that each contributes to the achievement of specific educational objectives. Previous research demonstrates that well-designed blended learning environments promote higher student engagement, improve the organization of the educational process, facilitate personalized learning, and support the sustainable development of professional competencies (Anthony et al., 2022; Ashraf et al., 2021).

Despite the extensive use of digital technologies in higher education, the organization of teaching practicum often remains fragmented. Educational resources, lesson plans, methodological guidelines, assessment documents, and reflective reports are frequently stored across multiple platforms and exchanged through different communication channels. This fragmentation complicates collaboration among student teachers, mentor teachers, and university lecturers, limits opportunities for timely feedback, and reduces the effectiveness of professional mentoring. Consequently, there is a growing need for an integrated digital environment capable of supporting the organization, documentation, and management of the entire teaching practicum process.

Modern web-based platforms provide extensive opportunities for centralized management of educational resources, collaborative development of teaching materials, communication, assessment, and monitoring of professional development. However, most existing solutions have been developed as general-purpose learning management

systems and fail to adequately addressthe specific requirements of teaching practicum or the subject area of Technology and Entrepreneurship. Furthermore, relatively few studies have examined blended learning as a comprehensive model for the practical preparation of future teachers supported by a specialized web-based platform that integrates methodological preparation, lesson planning, communication, assessment, and professional reflection within a unified educational environment.

This research addresses this gap by proposing an original blended learning model specifically designed for the practical preparation of future Technology and Entrepreneurship teachers. Unlike previous studies focusing either on individual technological solutions or on general blended learning frameworks, the proposed model combines organizational, pedagogical, technological, communicative, assessment, and reflective components within a single digital educational environment implemented through a specialized web-based platform.

This study aims to develop and present a blended learning model supported by a specialized web-based platform for the practical preparation of future Technology and Entrepreneurship teachers and to evaluate its potential to improve the organization of the teaching practicum, enhance collaboration among participants, and support the development of students' professional competencies.

To achieve this aim, the following research objectives were formulated:-

- to analyze contemporary theoretical perspectives on blended learning and the digital transformation of teacher education;
- to develop an original blended learning model supported by a specialized web-based platform;
- to investigate the applicability of the proposed model in the practical preparation of future Technology and Entrepreneurship teachers;
- to evaluate the impact of the platform on the organization of teaching practicum, collaboration among participants, and the development of students' professional competencies.

The study is based on the following research hypothesis:-

Integrating a specialized web-based platform into a blended learning model will improve the organization of the teaching practicum, facilitate collaboration among student teachers, mentor teachers, and university lecturers, and support the development of the professional, methodological, digital, and reflective competencies of future Technology and Entrepreneurship teachers. The scientific contribution of this study resides in the development of an original blended learning model that incorporates methodological preparation, school-based teaching practice, and the functionalities of a specialized web-based platform within a unified organizational and pedagogical framework. The proposed model extends existing approaches to the practical preparation of future teachers by offering a structure specifically designed to address the distinctive characteristics of Technology and Entrepreneurship teacher education while responding to contemporary trends in the digital transformation of teacher education.

Literature Review and Theoretical Framework:-

Blended Learning in Higher Education:-

Blended learning has become one of the most dynamically developing concepts in higher education, particularly in the context of accelerated digital transformation. The expansion of learning infrastructure and accumulated experience from the use of online technologies have led to a reconsideration of traditional teaching models and the development of approaches that combine the advantages of face-to-face and online learning. Contemporary research defines blended learning as a pedagogical model in which face-to-face and digital learning activities are integrated into a unified educational environment rather than functioning as separate or parallel modes of instruction (Anthony et al., 2022). A key characteristic of this model is the purposeful allocation of learning activities across different environments according to their pedagogical advantages. Online components support independent preparation, access to resources, communication, and feedback, whereas face-to-face activities provide direct interaction, practical work, and pedagogical mentoring.

The systematic review by Anthony et al. (2022), which covered 94 publications, indicates that the effectiveness of blended learning depends on the interaction among technological, pedagogical, and organizational factors. The authors emphasize that the availability of a digital platform alone does not guarantee improved outcomes unless it is supported by a clearly structured pedagogical model that defines the role of learning activities, interaction among participants, and assessment procedures.

Similar conclusions are presented by Ashraf et al. (2021), who identify increased engagement, broader opportunities for personalized learning, improved access to educational resources, and the development of independent learning

skills as the main advantages of blended learning. At the same time, the authors note that, when insufficiently structured, online components may remain merely supplementary to traditional instruction without substantially transforming the learning process. Blended learning should therefore be understood not as a technological solution but as a comprehensive pedagogical concept in which digital technologies serve the achievement of predefined educational objectives. In the present study, this concept is adopted as the organizational and didactic foundation for the practical preparation of future Technology and Entrepreneurship teachers.

Models and Principles of Blended Learning:-

The development of blended learning is based on pedagogical models that describe the interaction among learners, instructors, educational content, and the digital learning environment. Among the most influential conceptual frameworks are the Community of Inquiry model; the Technological Pedagogical Content Knowledge framework, which conceptualizes effective teaching as the integration of technological, pedagogical, and content knowledge (Mishra & Koehler, 2006); and the theories of experiential learning and reflective practice. The Community of Inquiry model views effective learning as the result of interaction among cognitive, social, and teaching presence. In blended learning environments, these components support students' active participation, the development of a learning community, and purposeful pedagogical guidance. The TPACK framework emphasizes the interrelationship among subject content, pedagogical methods, and digital technologies. Preparing future teachers requires not only acquiring technological skills but also making pedagogically informed choices of digital tools aligned with learning objectives and the specific characteristics of the subject content.

Additional theoretical foundations are provided by the concepts of experiential learning (Kolb, 1984) and reflective practice (Schön, 1983). These concepts view professional development as a cyclical process involving practical experience, analysis, interpretation, and the continuous improvement of one's own practice. Such ideas are particularly relevant to the preparation of future teachers, whose pedagogical competencies are developed through authentic professional activity and systematic reflection. These concepts form the theoretical bases of the proposed model, which integrates face-to-face practical activities with online interaction by a specialized web-based platform.

Practical Training of Pre-service Teachers:-

Practical training represents a key stage in the professional development of future teachers because it provides opportunities to apply acquired knowledge in authentic educational settings. Through the observation, planning, delivery, and analysis of lessons, student teachers develop professional competencies that cannot easily be acquired solely within the university classroom. Contemporary research emphasizes the role of mentoring, professional collaboration, and reflective practice as essential factors in the effective organization of the teaching practicum (Perry et al., 2021). Effective interaction among the student teacher, the school-based mentor teacher, and the university lecturer supports the development of professional identity, strengthens critical analytical skills, and facilitates the transition from theoretical preparation to independent teaching practice.

At the same time, several studies indicate that teaching practicum continues to be characterized by fragmented communication, limited opportunities for monitoring individual progress, and insufficient integration between university-based preparation and the school environment. This highlights the need for models that combine methodological preparation, practical activity, mentoring, and professional reflection within a unified educational environment.

Specific Features of Technology and Entrepreneurship Teacher Education:-

The preparation of future Technology and Entrepreneurship teachers is interdisciplinary and practice-oriented in nature. In addition to pedagogical and methodological knowledge, students are expected to acquire knowledge and skills related to technological processes, engineering thinking, project-based learning, STEM approaches, and entrepreneurial competencies. This requires an organization of learning that combines theory, practical activity, and the use of contemporary digital technologies. Systematic reviews in the field of entrepreneurship education indicate that blended learning broadens opportunities for active, practice-oriented, and learner-centered learning. The combination of face-to-face activities and digital technologies can support experiential learning, collaboration, the solution of real-world problems, and the development of entrepreneurial projects. However, the effectiveness of such models depends on the pedagogically grounded integration of technologies, the clear structuring of learning activities, and their alignment with the intended educational objectives (Viebig, 2022; Chen et al., 2021).

Practical training in this subject area includes the development of didactic materials, the design of practical tasks, the use of specialized software, and the creation of digital educational resources. In accordance with the European Framework for the Digital Competence of Educators, DigCompEdu, the professional preparation of future teachers

should develop not only their ability to use digital technologies but also their capacity to select, create, and apply digital resources in pedagogically meaningful ways, facilitate interaction, and assess learning outcomes in digital environments (Redecker, 2017). The development of digital competencies should therefore be regarded not as an isolated objective but as an integral component of the professional preparation of future teachers.

Web-Based Platforms in Teacher Education:-

Web-based platforms have become an important tool for managing learning in higher education. Systems such as Moodle, Canvas, Google Classroom, and Microsoft Teams provide opportunities for organizing educational content, facilitating communication, conducting assessment, and monitoring learning activities. Despite their broad use, most of these systems are general-purpose learning management platforms and are not specifically designed to address the distinctive features of the teaching practicum. They rarely integrate, within a single environment, the development of lesson plans, interaction among student teachers, school-based mentor teachers, and university lecturers, professional reflection, and the assessment of practical teaching activities. The scientific literature contains a limited number of studies devoted to specialized web-based platforms for the practical preparation of future Technology and Entrepreneurship teachers. This gap justifies the development of an original model that integrates the pedagogical principles of blended learning with the functionalities of a specialized digital platform.

Theoretical Framework of the Proposed Model:-

The analysis of the scientific literature supports the need for a model that integrates the principles of blended learning, technological pedagogical knowledge, experiential learning, reflective practice, and the development of professional digital competencies within the practical preparation of future Technology and Entrepreneurship teachers (Mishra & Koehler, 2006; Kolb, 1984; Schön, 1983; Redecker, 2017). Based on the theoretical perspectives discussed above, an original blended learning model supported by a specialized web-based platform was developed. The model combines methodological preparation, the development of digital educational resources, the planning and implementation of the teaching practicum, communication among participants, assessment, and professional reflection within a unified digital environment. In this way, it provides both a theoretical and practical foundation for improving the quality of future teachers' preparation and strengthening interaction between the university and the school.

Proposed Blended Learning Model:-

The development of the proposed model is based on the results of the theoretical analysis, the identified limitations of existing approaches, and the need for a more effective organization of practical preparation. Blended learning is conceptualized not as a mechanical combination of face-to-face and online activities but as a pedagogically organized system in which the individual components function interdependently and support the development of professional competencies. At the core of the model is the integration of university-based preparation, school-based practice, and the specialized web-based platform within a unified educational environment. This integration ensures continuous connections among theoretical preparation, didactic design, the practical implementation of the teaching process, professional mentoring, and reflection on pedagogical practice.

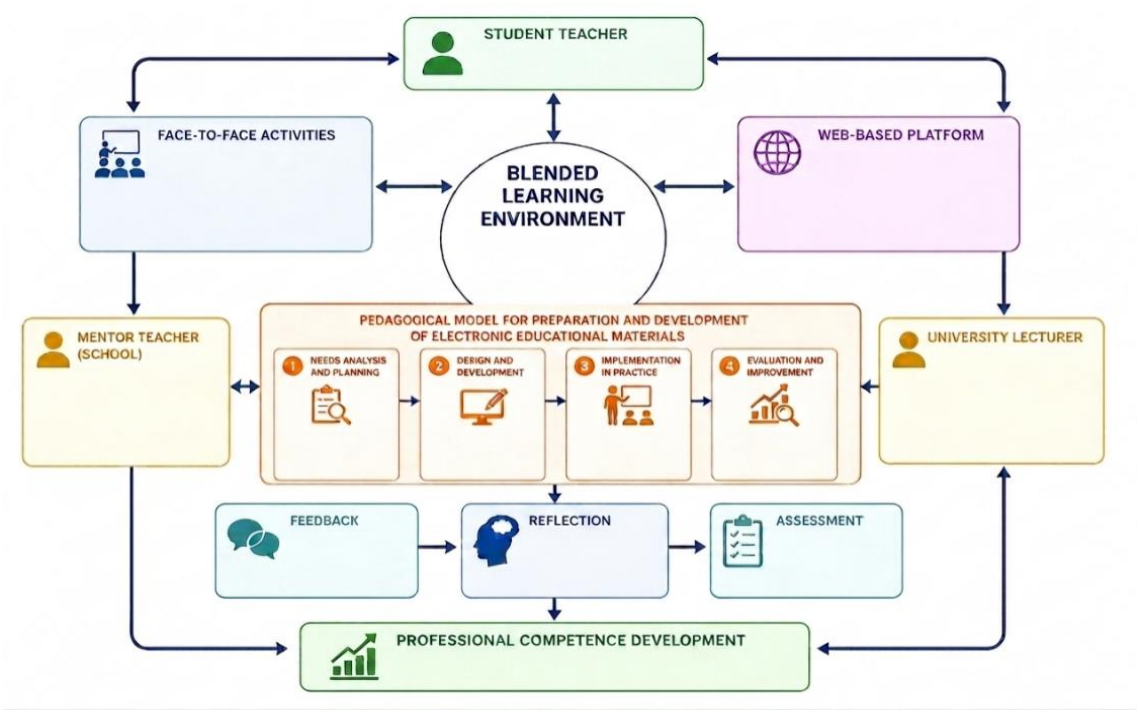


Figure 1. Conceptual structure of the proposed model.

The proposed model comprises four interconnected functional components:-

The first component encompasses students' fundamental and methodological preparation. At this stage, students develop knowledge in Technology and Entrepreneurship, pedagogy, psychology, and teaching methodology, which forms the basis for subsequent didactic design. Alongside subject-specific preparation, students also develop initial skills in using digital technologies to create educational content. The second component concerns the design and development of digital educational materials. Students create electronic resources, lesson plans, learning scenarios, and digital didactic materials that are used both in university-based preparation and in authentic teaching practice. At this stage, the platform functions as an environment for collaborative work, resource storage, and the exchange of methodological ideas.

The third component involves the implementation of practical preparation through blended learning. Some activities are conducted face-to-face in university and school settings, whereas others are carried out through the platform. Face-to-face activities include microteaching, classroom observation, independent teaching, and practical work with pupils. The online component supports lesson preparation, communication, the provision of methodological guidance, discussion of the developed materials, and documentation of completed activities. The fourth component focuses on assessment, feedback, and professional reflection. Following the delivery of lessons, students analyze their own practice, receive recommendations from school-based mentor teachers and university lecturers, and revise the materials they have developed. Professional development is thus implemented as a continuous cycle of planning, action, analysis, and improvement.

A distinctive feature of the model is that the platform does not function merely as an electronic repository. It provides an integrated environment for managing practical preparation, within which communication, the development of educational resources, the monitoring of individual progress, assessment, and professional reflection take place. In this way, the digital environment becomes an active pedagogical component that supports every stage of practical preparation.

Research Methodology:-

Research Design:-

The study was conducted as design-based research (DBR), combining the development of an innovative pedagogical model with its practical implementation and evaluation in an authentic educational setting. This approach enabled

the design, pilot, analysis, and refinement of the pedagogical intervention through continuous interaction between theory and practice.

The study was carried out within the practical preparation of students enrolled in the Technology and Entrepreneurship teacher education program at the Faculty of Engineering and Technology of South-West University "Neofit Rilski." The proposed model was implemented through a specialized web-based platform developed to support interaction among students, university lecturers, and school-based mentor teachers.
The model was developed based on the theoretical perspectives presented in the literature review and was subsequently implemented and piloted under authentic conditions during the teaching practicum.

Sample Characteristics:-
The study involved a total of 93 participants: 81 student teachers and 12 mentors, including 7 school-based mentor teachers and 5 university lecturers. The participants performed complementary roles in the piloting and evaluation of the proposed blended learning model supported by a specialized web-based platform. Interaction between the students and the two groups of mentors was carried out through a combination of face-to-face activities and online work within the platform. This made it possible to monitor all stages of the practical preparation process, from the development of educational materials and lesson planning to assessment, feedback, and professional reflection.

Table 1. Characteristics of the study participants

Participant group	Number (n)	Percentage (%)
Student teachers	81	87,1
School-based mentor teachers	7	7,5
University lecturers serving as mentors	5	5,4
Total	93	100,0

Student teachers constituted most of the sample (87.1%), which was consistent with the aim of the study to evaluate the applicability and effectiveness of the model in the practical preparation of future teachers. The inclusion of school-based mentor teachers and university lecturers as expert groups enabled a multidimensional evaluation and facilitated comparison among the perspectives of the main participants in the teaching practicum.

Research Instruments:-
A set of complementary instruments was used to collect empirical data and evaluate the proposed model:-
- a student questionnaire;
- pedagogical observation;
- analysis of students' activity within the web-based platform;
- expert evaluation by school-based mentor teachers and university lecturers;
- analysis of the digital educational materials and learning scenarios developed by the students.

The questionnaire was designed in accordance with the aim of the study and the principal components of the proposed model. The integration of quantitative and qualitative methodologies facilitated a more comprehensive assessment of the pedagogical intervention's efficacy and its influence on the organization of practical training.

Research Procedure:-
The research procedure was implemented in four consecutive stages:-
The first stage involved the development of the original blended learning model and the adaptation of the web-based platform to the specific characteristics of the practical preparation of future Technology and Entrepreneurship teachers. The second stage included introductory training in the use of the platform and the development of digital educational resources and learning scenarios. The third stage involved implementing the teaching practicum through a blended learning model combining face-to-face activities with online interaction via the web-based platform.
The fourth stage focused on the collection and analysis of empirical data, the evaluation of the model's effectiveness, and the formulation of recommendations for its further improvement.

The stages were implemented sequentially, with the outcomes of each preceding stage serving as the basis for the implementation of the next.

Data Analysis:-

The gathered data were evaluated through descriptive statistical analysis. Descriptive statistics, including frequencies, percentages, means (M), and standard deviations (SD), were used to summarize students' and mentors' responses. The results were also presented graphically to facilitate the interpretation of indicators related to the organization of the teaching practicum, the effectiveness of the web-based platform, and the development of professional competencies. The internal consistency of the student questionnaire was assessed using Cronbach's alpha coefficient. For the main scale, which included items related to the organization of the teaching practicum, mentor support, communication, practical training, and overall satisfaction, a value of $\alpha = 0.764$ was obtained, indicating acceptable internal consistency and reliability of the instrument. When all 11 quantitatively coded items were included, the value was $\alpha = 0.699$. The conceptual heterogeneity of the questionnaire may explain the lower coefficient, as the items covered different aspects of the teaching practicum and the use of the platform.

Ethical Considerations:-

The study was conducted in accordance with the fundamental ethical principles governing educational research. All participants were informed in advance about the aims and conditions of the study. Participation was voluntary, and the data were processed anonymously and used solely for research purposes.

The study was conducted in compliance with the internal regulations of South-West University "Neofit Rilski" and with generally accepted ethical standards for scientific research.

Results and Discussion:-

The analysis covers the responses of 81 student teachers and 12 mentors, including 7 school-based mentor teachers and 5 university lecturers. The following subsections present the findings related to the organization of the teaching practicum, the effectiveness of the web-based platform, the development of professional competencies, and the mentors' expert evaluation.

Organization of the Teaching Practicum:-

The first stage of the analysis focused on students' perceptions of the organization of the teaching practicum implemented through the proposed blended learning model. The results indicate a high level of satisfaction with the overall organization of the practicum. The aims and tasks were completely clear to 70.4% of the students and sufficiently clear to 28.4% (M = 4.69; SD = 0.49). The organization provided by the university also received high ratings: 48.1% of the respondents assessed it as excellent, while 46.9% rated it as very good (M = 4.43; SD = 0.59).

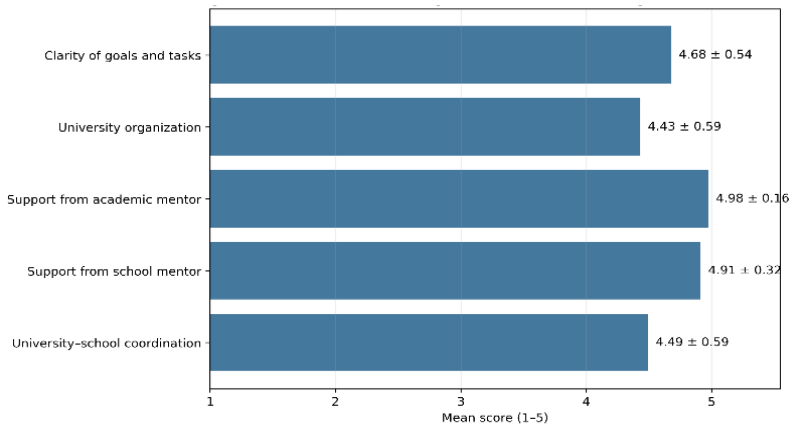


Figure 2. Evaluation of the organization of the teaching practicum (n = 81)

Mentor support was rated particularly highly. According to 97.5% of the students, university mentors consistently provided the necessary guidance throughout the practicum (M = 4.98; SD = 0.16). At the same time, 92.6% reported that school-based mentor teachers always supported them in lesson planning and the organization of classroom activities (M = 4.91; SD = 0.32).

The data indicate that the proposed model provides a well-structured teaching practicum and effective coordination among the university, school-based mentors, and students. The consistently high ratings suggest that the combination of face-to-face activities and work within the platform creates favorable conditions for practical training.

Effectiveness of the Web-Based Platform:-

Students perceived the web-based platform as a key tool for organizing and coordinating their practical preparation. According to 92.6% of the respondents, the platform significantly improved communication among students, university lecturers, and school-based mentor teachers (M = 4.85; SD = 0.53). This finding indicates that the integrated digital environment supports interaction among participants and ensures a continuous exchange of information. A total of 69.1% of the students reported that the platform facilitated the organization and implementation of the practicum to a very great extent (M = 4.07; SD = 1.39). The relatively high standard deviation indicates variation in students' individual experiences and in the ways they used the different platform functionalities. The platform's contribution to the development of pedagogical skills was also rated highly. According to 86.4% of the students, it supported lesson planning, the development of educational materials, and professional reflection to a very great extent (M = 4.73; SD = 0.69). The results show that the platform performs a broader function than a traditional learning management system. In addition to the centralized storage of resources, it supports communication, the provision of timely feedback, the monitoring of practical activities, and the documentation of professional development.

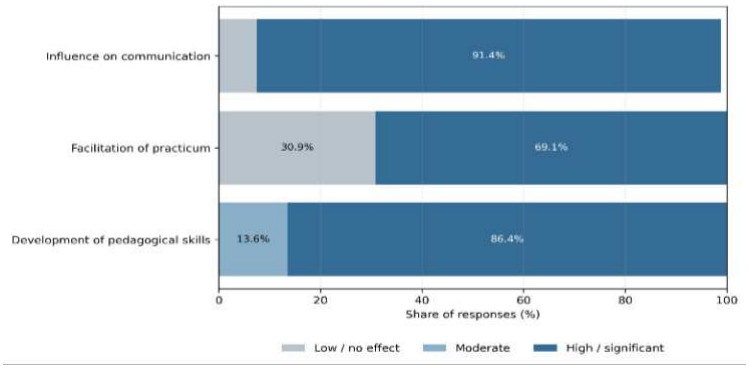


Figure 3. Evaluation of the web-based platform (n = 81)

Development of Professional Competencies:-

The proposed model had a positive impact on the development of the professional competencies of future Technology and Entrepreneurship teachers. The opportunity to apply theoretical knowledge in an authentic school environment was rated as excellent by 55.6% of the students and as very good by 42.0% (M = 4.53; SD = 0.55). This confirms the successful integration of theoretical preparation with practical teaching experience. The teaching practicum also contributed substantially to the development of interpersonal and professional skills. According to 86.4% of the respondents, it supported the development of communication, collaboration, and classroom interaction to a very great extent (M = 4.86; SD = 0.35).

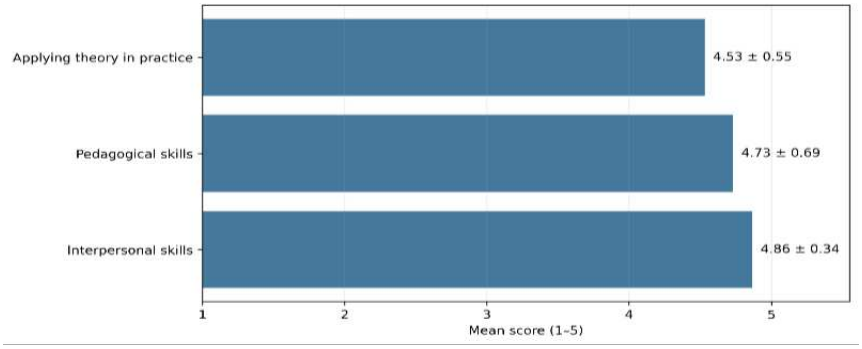


Figure 4. Students' self-assessment of the development of professional competencies (n = 81)

The educational value of the practicum was also rated highly. The development of practical teaching skills was identified as the most valuable outcome by 84.0% of the students. Overall satisfaction was very high (M = 4.80; SD = 0.46), with 82.7% of the respondents selecting the highest satisfaction categories. These findings indicate that the proposed model supports the development of key professional competencies by establishing sustainable links among theoretical preparation, practical teaching experience, and reflective learning.

Evaluation by Mentor Teachers:-

The mentors' expert evaluations confirm the findings obtained from the student questionnaire. The overall usability of the platform received a positive rating (M = 3.92; SD = 0.29), indicating that its interface and functionalities were perceived as clear and accessible for use during the teaching practicum. All mentors awarded the highest possible rating (M = 5.00) to the platform's contribution to professional reflection, communication and collaboration, as well as to access to educational resources and examples of good pedagogical practice. Its contribution to the development of digital competencies was also rated very highly. All respondents considered the platform useful and stated that they would recommend its use to other mentors. The most frequently identified strengths were timely feedback, resource sharing, and improved communication among participants. Integration with other educational information systems was identified as the main opportunity for further development.

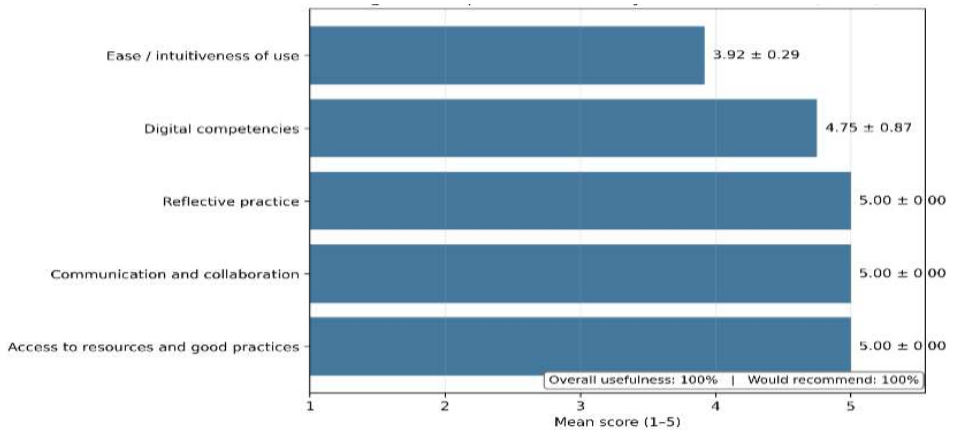


Figure 5. Mentors' expert evaluation of the web-based platform(n=12)

Overall, the expert evaluations confirm that the platform supports not only students' practical training but also the coordination, consultation, and assessment activities performed by mentors.

Discussion:-

The findings support the research hypothesis that integrating a specialized web-based platform into a blended learning model improves the organization of the teaching practicum, facilitates interaction among participants, and supports the development of the professional competencies of future Technology and Entrepreneurship teachers.

The high ratings regarding the clarity of objectives, mentor support, and platform effectiveness indicate that successful practical preparation is based on the integration of pedagogical, technological, and mentoring components within a unified educational environment. The platform does not replace face-to-face interaction; rather, it extends it through continuous communication, resource sharing, timely feedback, and systematic professional reflection.

The findings are consistent with previous research on blended learning and digital learning environments, according to which technology-supported teaching practice improves collaboration, reflective learning, and the transfer of theoretical knowledge to authentic educational settings (Anthony et al., 2022; Chen et al., 2021; Perry et al., 2021; Short et al., 2021; Viebig, 2022). The similarity between the students' and mentors' evaluations strengthens the credibility of the findings and indicates a shared positive perception of the proposed model.

The high ratings regarding the platform's contribution to the development of digital competencies suggest that the model enables future teachers to use technology not merely as an operational tool but as a means of designing resources, facilitating communication, conducting assessment, and supporting professional reflection. This is consistent with the core areas of the DigCompEdu framework (Redecker, 2017).

Despite the overall positive evaluation, differences in students' judgments regarding the extent to which the platform facilitated the practicum indicate the need for more structured introductory training and more consistent use of its functionalities. Practical recommendations for improvement include allocating more time for the preparation and implementation of learning activities, integrating the platform with other educational information systems, and expanding its analytical tools and feedback mechanisms. The specific contribution of the proposed model lies in integrating methodological preparation, digital educational resources, school-based teaching practice, mentoring, assessment, and professional reflection within a unified web-based environment designed specifically for the practical preparation of future Technology and Entrepreneurship teachers.

Conclusions:-

This study evaluated the implementation of a blended learning model supported by a specialized web-based platform in the teaching practicum of future Technology and Entrepreneurship teachers. The findings confirm the research hypothesis that the purposeful integration of digital technologies with face-to-face practical activities improves the organization of the teaching practicum, facilitates communication, and supports the development of professional competencies. The empirical findings demonstrate a high level of satisfaction among both student teachers and mentors with the organization of the practicum, access to educational resources, communication, and the quality of mentoring support. The platform proved to be an effective environment for coordinating practical activities, maintaining continuous interaction, providing timely feedback, and fostering professional reflection. Rather than replacing face-to-face interaction, it extends and enhances traditional teaching practicum by complementing direct communication among participants.

A major contribution of the proposed model lies in its integration of methodological preparation, lesson planning, the development of digital educational resources, school-based teaching practice, mentoring, and assessment within a unified web-based environment. Unlike general-purpose learning management systems, the platform was specifically designed to address the organizational, methodological, and communication needs of participants involved in the teaching practicum. The study also has important practical implications. The proposed model can be implemented in teacher education programs to improve the management of practical training, strengthen collaboration between universities and partner schools, and support the development of the digital and pedagogical competencies required in contemporary education. Furthermore, the platform may serve as a foundation for extending digital support to other teacher education programs.

Several limitations should be considered when interpreting the findings. The study was conducted at a single university and involved only one teacher education program. In addition, the evaluation relied primarily on questionnaire data collected during a single implementation cycle of the proposed model. Consequently, the generalizability of the findings is limited to the context of the investigated sample. Future research should involve larger and more diverse samples drawn from multiple higher education institutions, enabling comparative analyses across different teacher education programs. Further studies should also examine the long-term impact of the proposed model on graduates' professional development, as well as explore the potential for integrating learning analytics, artificial intelligence, and adaptive feedback mechanisms into the platform. In conclusion, the proposed blended learning model demonstrates considerable potential for modernizing the practical preparation of future Technology and Entrepreneurship teachers by combining pedagogical mentoring with the opportunities offered by digital technologies within a coherent, integrated, and sustainable educational environment.

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