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THE ROLE OF THE TEACHER IN THE 21ST CENTURY AND THE PATHS FOR THE FUTURE OF HIGHER EDUCATION

O PAPEL DO PROFESSOR NO SÉCULO XXI E OS CAMINHOS PARA O FUTURO DO ENSINO SUPERIOR

EL PAPEL DEL PROFESOR EN EL SIGLO XXI Y LOS CAMINOS PARA EL FUTURO DE LA EDUCACIÓN SUPERIOR

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ABSTRACT

Higher education is currently facing a structural transformation driven by social, technological and pedagogical changes. In this context, the role of the teacher acquires new dimensions, requiring multifaceted skills and an attitude of permanent adaptation. This article analyses the main functions of the teacher in the 21st century and discusses possible paths for the future of higher education, namely the personalisation of learning, lifelong learning, the integration of transversal skills, sustainability, internationalisation and the culture of innovation. It is argued that the teacher must be at the same time a facilitator, mentor, researcher and agent of social transformation.

Keywords: Higher Education. Teaching. Pedagogical Innovation. Skills. Lifelong Learning. Future of Education.

RESUMO

O ensino superior está atualmente enfrentando uma transformação estrutural impulsionada por mudanças sociais, tecnológicas e pedagógicas. Neste contexto, o papel do professor adquire novas dimensões, exigindo competências multifacetadas e uma atitude de adaptação permanente. Este artigo analisa as principais funções do professor no século XXI e discute possíveis caminhos para o futuro da educação superior, nomeadamente a personalização da aprendizagem, a aprendizagem ao longo da vida, a integração de competências transversais, a sustentabilidade, a internacionalização e a cultura de inovação. Argumenta-se que o professor deve ser simultaneamente um facilitador, mentor, investigador e agente de transformação social.

Palavras-chave: Ensino Superior. Ensino. Inovação Pedagógica. Competências. Aprendizagem ao Longo da Vida. Futuro da Educação.

RESUMEN

La educación superior se enfrenta actualmente a una transformación estructural impulsada por cambios sociales, tecnológicos y pedagógicos. En este contexto, el papel del docente adquiere nuevas dimensiones, exigiendo competencias multifacéticas y una actitud de adaptación permanente. Este artículo analiza las principales funciones del docente en el siglo XXI y discute posibles caminos para el futuro de la educación superior, es decir, la

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personalización del aprendizaje, el aprendizaje a lo largo de la vida, la integración de competencias transversales, la sostenibilidad, la internacionalización y la cultura de la innovación. Se argumenta que el docente debe ser simultáneamente un facilitador, mentor, investigador y agente de transformación social.

Palabras clave: Educación Superior. Docencia. Innovación Pedagógica. Competencias. Aprendizaje a Lo Largo de la Vida. Futuro de la Educación.

1 INTRODUCTION

Contemporary society places increasing demands on the higher education system, particularly in terms of inclusion, innovation and pedagogical quality. The university professor ceases to be just a transmitter of knowledge and becomes an active agent of educational and social transformation.

The 21st century has transformed the educational landscape through rapid technological advancement, globalization, and evolving societal demands. Grounded in recent literature and empirical studies, including perspectives on digital literacy, virtual teaching, and sustainability, we argue that educators must transcend traditional content delivery and instead become facilitators of lifelong learning, critical thinking, and global citizenship. We highlight key competencies required of 21st-century educators, discuss the challenges within the higher education system—particularly in developing regions—and propose a model for inclusive, technology-enhanced, and student-centered learning environments.

Education in the 21st century operates within a context of rapid digital transformation, shifting job markets, and urgent global challenges such as climate change, pandemics, and social inequality. These dynamics demand a reconfiguration of higher education's core mission and the teacher's role. Far from being mere transmitters of knowledge, educators are now called to be designers of learning experiences, agents of change, and mediators between knowledge and society.

This article aims to discuss the new role of the teacher in the 21st century and the strategic paths that can support the future of higher education and describes possible paths for future transformations.

2 LITERATURE REVIEW

2.1 THE ROLE OF THE TEACHER IN THE 21ST CENTURY

The traditional teaching paradigm, centered on the teacher as the sole source of knowledge, has been replaced by models centered on the student and the active construction of knowledge (Perrenoud, 2000). The teacher becomes a facilitator of learning, promoting environments that encourage reflection, autonomy and critical thinking.

The role of the teacher has evolved from a knowledge provider to a learning facilitator, mentor, and innovator. As Lang and Šorgo (2024) demonstrate, the integration of smartphones and tablets into education enhances the acquisition of 21st-century skills, such

as critical thinking, creativity, collaboration, and digital literacy, highlighting the importance of a pedagogy that embraces technological tools for sustainable learning.

In virtual environments, teachers must also navigate new demands: they must adapt to asynchronous communication, provide personalized feedback, foster digital engagement, and maintain human connection in virtual spaces (Makda, 2024).

In addition, teachers must have:

- Pedagogical and technological skills - University teaching requires robust pedagogical skills, namely in the design of meaningful learning experiences and the effective use of digital technologies (Selwyn, 2016). Tools such as virtual learning environments, collaborative platforms and multimedia resources are part of the new teaching repertoire.
- Mentor and advisor - In addition to the academic dimension, the teacher must assume the role of mentor, promoting individualized monitoring of students, supporting their personal and professional development (Tinto, 2012).
- Researcher and knowledge producer - Research continues to be an integral part of teaching identity, but it also takes on a pedagogical-reflexive character, through action research and analysis of practice (Schön, 1983).
- Agent of inclusion and social transformation - The teacher is also an agent of change, committed to social justice and the promotion of inclusive, intercultural and diversity-sensitive educational practices (Freire, 1975).

2.2 VIRTUAL TEACHING AND THE DIGITAL TRANSFORMATION OF HIGHER EDUCATION

Virtual teaching, once a response to disruption, is now a pillar of sustainable education. Bibliometric evidence shows that since 2020, virtual instruction has surged, driving accessibility, flexibility, and personalized learning (Makda, 2024). However, this transition is not without challenges: the digital divide, lack of infrastructure, and teacher training deficits pose significant barriers.

Lack of educational infrastructure and lack of adequate teacher training are significant barriers to access and quality of education in many regions of the world. According to UNESCO, to achieve the goal of universal primary education by 2030, 24.4 million more teachers will be needed for primary education and 44.4 million more for secondary education, totaling around 69 million teachers worldwide.

Most affected regions:

• Sub-Saharan Africa

This region faces the greatest teacher shortage, with a need for 5.4 million primary school teachers and 11.1 million secondary school teachers. About 90% of schools face a severe teacher shortage. Furthermore, classrooms are among the most overcrowded in the world, with an average of 52 students per teacher in primary school, compared to the global average of 26.

• South Asia

It is the second region with the largest deficit, needing 1.7 million primary school teachers and 5.3 million complementary education teachers to achieve educational objectives.

• Europe and North America

Despite low birth rates, these regions rank third in the world in terms of teacher shortages, with a shortage of 4.8 million professionals.

Main causes:

• Unattractive working conditions: Uncompetitive salaries and work overload discourage entry and continuation in the teaching profession.
• Lack of adequate training: Many teachers, especially in low-income countries, do not have the necessary training to provide quality education.
• Inadequate funding: Insufficient financial resources compromise the construction and maintenance of school infrastructure and the provision of ongoing training for teachers.

Addressing these issues is crucial to ensuring quality and equitable education worldwide, promoting sustainable development and social cohesion.

Virtual education promotes ubiquitous learning, breaking geographical and temporal constraints and offering inclusive educational opportunities. Teachers must be proficient in digital pedagogy, able to select content, manage virtual classrooms and promote student autonomy.

3 PATHS TO THE FUTURE OF HIGHER EDUCATION

3.1 PERSONALIZING LEARNING

Personalizing learning paths, supported by technologies such as artificial intelligence, allows us to better respond to students' individual needs and increase pedagogical effectiveness (Siemens, 2014).

Personalizing learning places, the student at the center of the educational process, adapting content, methodologies and teaching strategies to meet the needs, interests and pace of each individual. Technologies such as artificial intelligence, data analysis and adaptive platforms allow each student's educational trajectory to be adjusted, promoting greater autonomy and engagement. This model breaks with standardized teaching, valuing the diversity of learning styles and students' previous experiences.

3.2 LIFELONG LEARNING

The concept of continuous learning implies a reconfiguration of the training offer, with greater curricular flexibility, modularization and remote access. Micro-credentials and short courses gain prominence in this context (UNESCO, 2022).

Lifelong learning is an approach that recognizes that education is not limited to childhood or youth, but is an ongoing process throughout life. UNESCO highlights the importance of educational policies and practices that promote quality inclusive education systems, supporting Member States in developing lifelong learning policies. In the context of higher education, this involves offering opportunities for continuing education, adapted to the needs of different audiences, including adults undergoing professional retraining and seniors seeking to update their knowledge.

3.3 INTEGRATION OF SOFT SKILLS

21st century skills must be systematically integrated into higher education, preparing students for multidisciplinary, collaborative and constantly changing work environments (OECD, 2018).

Soft skills, also known as transversal skills, are essential skills for personal and professional success in the 21st century. They include cognitive and metacognitive skills, such as learning to learn; social and emotional, such as empathy and communication skills; and practical and physical, associated with manual and artistic tasks. Integrating these skills

into the higher education curriculum is essential to prepare students to face the challenges of an ever-changing world.

3.4 SUSTAINABILITY AND SOCIAL RESPONSIBILITY

Higher education institutions must align themselves with the Sustainable Development Goals (SDGs), promoting education committed to environmental, economic and social sustainability (Cortese, 2003).

Higher education institutions play a crucial role in promoting sustainability and social responsibility. By aligning with the United Nations Sustainable Development Goals (SDGs), universities can incorporate sustainable practices into their operations, promote research focused on sustainable solutions, and educate citizens who are aware and engaged with social and environmental challenges. This includes integrating Education for Sustainable Development into curricula, encouraging students to acquire the knowledge, skills, attitudes and values needed to build a sustainable future.

3.5 INTERNATIONALIZATION AND INTERCULTURALITY

Internationalization must integrate physical and virtual mobility, joint programs and the promotion of intercultural competence, preparing students for global citizenship (Knight, 2004).

The internationalization of higher education goes beyond the physical mobility of students and teachers. It also involves virtual mobility, enabling collaboration between institutions in different countries through digital technologies. This approach expands access to intercultural experiences, promoting understanding and respect for cultural diversity. Furthermore, internationalization contributes to improving the quality of teaching and research, strengthening global academic collaboration networks.

3.6 CULTURE OF PEDAGOGICAL INNOVATION

Innovating in teaching involves taking risks, experimenting and critically evaluating practices. Institutions must support teachers in this process, creating support structures, encouraging pedagogical research and valuing teaching excellence (Bates, 2015).

4 METHODOLOGY

This article was developed using a qualitative and descriptive approach, supported by bibliographical research and critical analysis of recent studies on higher education, pedagogical practices, and the role of teachers in the 21st century. The methodology adopted comprised three main aspects:

Regarding the literature review, a systematic selection of theoretical works and empirical studies published in recent decades was carried out, with an emphasis on references addressing the digital transformation of education, lifelong learning, the development of transversal skills, sustainability, and internationalization. Priority was given to sources from recognized international organizations, such as UNESCO, the OECD, and the European Commission, and academic scientific publications.

In the thematic analysis aspect, the selected literature was examined in order to identify recurring themes and emerging perspectives regarding the role of the teacher in higher education.

From this process, six strategic areas for the future of higher education were synthesized: personalization of learning, lifelong learning, integration of transversal skills, sustainability, internationalization, and pedagogical innovation.

The collected contributions were critically discussed in light of contemporary challenges such as the digital divide, global inequalities in access to education, and the need for inclusive and adaptive teaching models. This critical synthesis allowed for the articulation of proposals for reconfiguring the role of teachers and building future-oriented educational ecosystems.

5 THE NEED FOR 21ST-CENTURY SKILLS IN HIGHER EDUCATION

The success of graduates in today's Knowledge Age depends on 21st-century skills, not just traditional ones like reading, writing, and arithmetic. Higher education institutions and policymakers must recognize the importance of the so-called 4Cs*: critical thinking, communication, collaboration, and creativity.* These skills are fundamental to preparing students for the digital economy and cannot be seen as supplementary skills, but rather as essential skills for employability and active citizenship (Kern, 2024).

21st-century skills, especially the 4Cs, are recognized as essential for navigating the complex demands of the job market and contemporary life. Universities have a responsibility to develop these skills in graduates, going beyond the mere transmission of knowledge.

The focus is on how to prepare students for lifelong learning, the use of innovative technologies, and the need to face global challenges. This requires a review of traditional curricula, more personalized pedagogies, and the integration of ethical and social awareness. Higher education institutions must create learning environments that help students understand how they think and learn, empowering them to act critically and creatively in uncertain contexts.

In the Austrian context, for example, primary and university curricula already emphasize the importance of fostering curiosity, creative expression, aesthetic literacy, and digital skills from an early age, preparing students for the transition to more advanced levels of education (Eurydice, 2019).

5.1 IMPORTANT SKILLS

Lang and Šorgo (2024) underscore that technological devices are not only tools but catalysts for the development of skills essential for sustainability. Teachers play a critical role in operationalizing these skills, which include:

- Critical thinking and problem-solving
- Creativity and innovation
- Digital and media literacy
- Collaboration and communication
- Adaptability and lifelong learning

Students, teachers, and parents agree on the potential of smart devices in developing these skills, yet gaps remain in effective pedagogical integration.

5.2 CHALLENGES IN HIGHER EDUCATION: GLOBAL PERSPECTIVES

Singh (2015) highlights systemic issues in higher education, including quality disparities, outdated curricula, lack of infrastructure, and faculty shortages. Although countries like India have expanded access, excellence and innovation remain limited to a few elite institutions. The challenges are emblematic of many developing nations, where massification of higher education has not been accompanied by structural reforms or meaningful investment (Smith & Gillespie, 2023; Wolhuter & Niemczyk, 2023).

Moreover, global rankings show that institutions in developing countries are underrepresented, raising concerns about research quality, global competitiveness, and employability.

5.3 STRATEGIC DIRECTIONS FOR THE FUTURE

To effectively implement this new pedagogical paradigm, changes are needed on four main fronts:

a) Embracing change; teaching cannot continue with practices of the past ("business as usual").
b) Educator training; investing in professional development is necessary so that teachers master and teach the 4Cs.
c) Systemic reforms, curricula, educational policies, and assessments must explicitly incorporate these skills.
d) Engaging society, parents, communities, and decision-makers must understand and support the importance of the 4Cs.

Therefore, higher education must align with the global movement for 21st-century education, ensuring that students are prepared to thrive in a world driven by critical thinking, communication, collaboration, creativity, and digital technology (Barber, M. *et al*, 2013).

Research suggests a multifaceted strategy: focused professional development, collaboration among educators, support from institutional leaders, and alignment with broader educational priorities. This is necessary for higher education to truly implement the 4Cs and effectively prepare students (Hu, D. *et al*, 2021).

It is essential to create new curricular models that respond to the diverse needs of students and are aligned with social and technological transformations, aiming to produce graduates capable of competing in global contexts (Kilag & Sasan, 2023; Ribble & Park, 2022).

Teachers need ongoing training and pedagogical support to integrate innovative practices in the classroom, including the use of digital tools and open methodologies that encourage autonomy and creativity. One of the paths identified is to invest in interdisciplinary learning and collaborative projects, which develop sustainable skills for the future and help students connect academic knowledge to real-world problems.

The future of higher education lies in adaptive, inclusive, and technologically integrated ecosystems. Based on the reviewed literature, we propose the following strategic directions.

5.4 DIGITAL INCLUSION AND INFRASTRUCTURE DEVELOPMENT

Digital inclusion is essential to ensure equitable access to higher education. The European Commission has been promoting infrastructure modernisation and digitalisation projects in higher education institutions, aiming to increase the attractiveness of these institutions and support the green and digital transition through modernised infrastructure, digitalisation and capacity building activities (Aslam, R. *et al*, 2021; Iivari, N. *et al*, 2020).

Furthermore, initiatives such as the EDISON Alliance, in collaboration with the World Economic Forum, have worked to reduce the global digital divide by promoting access to essential digital services, including education, health and financial services, thus contributing to the UN Sustainable Development Goals (SDGs).

Applicable strategies:

- Invest in robust and accessible digital infrastructures.
- Implement digital literacy programs for students and teachers.
- Establish public-private partnerships to expand access to technology.

5.5 TEACHER DEVELOPMENT AND DIGITAL PEDAGOGY

Continuing teacher training is crucial for adapting to new pedagogical demands. Collaborative professional development models have been effective in promoting digital skills among teachers, allowing them to meaningfully integrate technologies into the teaching-learning process (Iivari, N, *et al*, 2020; Kara, N. *et al*, 2020).

Furthermore, frameworks such as DigCompEdu[2] offer structured guidelines for developing educators' digital skills, promoting pedagogical innovation and educational inclusion.

Applicable strategies:

- Implement ongoing professional development programs focused on digital skills.
- Foster communities of practice among teachers to share experiences and resources.
- Use recognized frameworks to guide the development of teaching digital skills.

[2] DigCompEdu - European Digital Competence Framework for Educators.

5.6 CURRICULAR REFORM: INTERDISCIPLINARITY AND PROJECTS

Curricular reform must promote interdisciplinarity and the development of 21st century skills. The University of Porto, for example, has led projects that aim to develop short courses in a mixed format, promoting transversal skills such as communication, critical thinking and leadership, using innovative methodologies such as “challenge-based learning” and gamification.

Applicable strategies:

- Revise curricula to include interdisciplinary and project-based components.
- Incorporate active learning methodologies that promote critical thinking and problem solving.
- Establish partnerships with external organizations for real and relevant projects.

5.7 GLOBAL COLLABORATION AND OPEN EDUCATIONAL RESOURCES (OER)

Global collaboration is facilitated by the use of digital technologies and OER[3]. The Open University of Portugal is an example of an institution that offers education entirely via e-learning, promoting the expansion of the Portuguese language and culture in the Portuguese-speaking world and contributing to the internationalization of higher education.

Applicable strategies:

- Develop and share OER to expand access to knowledge.
- Establish international partnerships for joint programs and virtual mobility.
- Promote interculturality through global curricula and international experiences.

5.8 SUSTAINABILITY AND SDG INTEGRATION

Higher education institutions play a key role in promoting sustainability and integrating the SDGs (Sustainable Development Goals). The University of Évora, for example, stands out for its commitment to sustainability, aligning itself with the Alentejo 2030 Regional Strategy for Smart Specialization and the 2030 National Agenda, contributing to the sustainable development of the region.

Applicable strategies:

- Integrate the SDGs into curricula and research activities.
- Promote sustainable practices in institutional operations.

[3] Open Educational Resources are any digital content that is in the public domain and has free licenses, and can be used in the classroom.

- Involve the academic community in projects that address social and environmental challenges.

6 CONCLUSION

In the 21st century, the teacher is not only a guide in the classroom but a navigator of digital spaces, a curator of meaningful experiences, and a catalyst for societal change. To ensure a resilient and future-proof higher education system, institutions must embrace transformation through strategic investment in technology, pedagogy, and policy reform. The convergence of virtual teaching, 21st-century skills, and sustainability frames a powerful vision for the future—one where education becomes a global, inclusive, and transformative force.

The 21st century university professor is challenged to reinvent himself in the face of a dynamic, uncertain and demanding educational context. The roles of facilitator, mentor, researcher and inclusion agent become central to ensuring the quality and relevance of higher education. On the other hand, the paths for the future point towards the personalization of learning, the valorization of transversal skills, the commitment to sustainability and the construction of an institutional culture of pedagogical innovation. Investing in teacher development and rethinking pedagogical models are fundamental conditions for higher education to fulfill its transformative mission in today's society.

The 4Cs are now the foundation of higher education: Communication, Collaboration, Creativity, and Critical Thinking are no longer complementary competencies, but essential to ensuring that graduates are prepared to face the challenges of the digital economy, global citizenship, and lifelong learning.

The future demands profound reforms: the effective integration of the 4Cs depends on pedagogical, curricular, and institutional changes, as well as continued investment in teacher training. Only with this strategic transformation will higher education be able to fulfill its role of preparing professionals and citizens capable of innovating and thriving in complex and uncertain contexts.

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