

## University Teachers' Perceptions of Their Competencies in Online Teaching

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### Abstract

*Online teaching, emerging as a fundamental paradigm in higher education, has marked a significant transformation in the current educational landscape. The objective of this study was to examine the competencies of faculty members at the State University of Milagro in online courses. A quantitative methodology with a non-experimental descriptive and explanatory design was adopted. It focused on analyzing the perceptions of a representative sample of 277 teachers. Data collection was conducted through a structured survey, specifically designed to assess various aspects of online teaching. This survey was distributed using Google Forms, ensuring research ethics through informed consent from the participants. Among the most relevant results, the following stand out: a balanced distribution of gender ( $\chi^2 = 3.60$ ,  $p = 0.46$ ) and academic rank ( $\chi^2 = 4.30$ ,  $p = 0.23$ ) was observed, suggesting that the sample is representative and not biased towards a specific gender or academic rank. Moreover, the experience in online teaching ( $\chi^2 = 6.20$ ,  $p = 0.28$ ) shows a wide diversity, ranging from novices to experts, providing a comprehensive understanding of online educational practices. It is highlighted that the competencies "Providing a consistent course structure" and "Ensuring alignment between objectives, content, and assessment" received the highest ratings, at approximately 4.55. From these results, it is concluded that the correlations between different roles within the virtual educational environment indicate significant interactions among various competencies.*

**Keywords:** Perception, competencies, university teaching, online education.

### Introduction

The contemporary educational landscape has undergone a fundamental transformation, driven by the integration of advanced technologies into teaching and learning processes

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(Amankwah-Amoah et al., 2021; Pinargote-Macías et al., 2022). This evolution, accelerated by unforeseen circumstances such as the COVID-19 pandemic, has precipitated a shift toward online teaching modalities. This paradigmatic change has sparked increasing interest in understanding teachers' perceptions of their roles and competencies in the digital context, highlighting the importance of adapting to new educational realities (Goldie, 2016; Noweski et al., 2012; Sepulveda-Escobar and Morrison, 2020).

Historically, online teaching has progressed from rudimentary correspondence-based methods to advanced interactive platforms, promoting immersive and collaborative learning. Existing research, including the study by Dean and Lima (2022), has analyzed the efficacy of online teaching, student experiences, and the integration of educational technologies. However, there remains a notable gap in the literature regarding teachers' perceptions of their role in these virtual environments.

Furthermore, educators face unique challenges in online teaching, ranging from adapting to emerging technologies to developing effective pedagogical strategies in a virtual environment (Carrillo and Flores, 2020; Kebritchi et al., 2017; Markova et al., 2017). Inadequate preparation and lack of institutional support, as highlighted by Lowe and Cook (2003), can negatively impact both teacher performance and student learning experiences.

Despite growing interest in online teaching, there is a lack of studies specifically focused on teachers' perceptions of their roles and competencies in this area (Baran et al., 2011; Diep et al., 2022; Wanner and Palmer, 2015). Understanding these perceptions, as Frazer et al. (2017), argue, is vital for developing effective training strategies and for the continuous improvement of virtual educational processes.

Research in this area is crucial for optimizing the quality of online education. Understanding in detail how teachers perceive and experience their role in these environments can significantly influence the development of educational policies, teacher training programs, and the design of more efficient, teacher-centered online learning platforms.

In this context, the question arises: What are teachers' perceptions of their roles and competencies in online teaching? Therefore, the aim of this research is to examine the competencies of the faculty members at the State University of Milagro, focusing on their performance in different roles.

## **Theoretical Foundations**

### **Evolution of Online Teaching**

Online teaching has undergone a significant evolution, transitioning from text-based methods to highly interactive and multimedia environments. According to Matthew et al. (2018), this transformation has been driven by technological advancements such as increased bandwidth, the proliferation of mobile devices, and the development of more sophisticated educational software. It is also noted how online learning platforms have evolved to offer more personalized and adaptive experiences, significantly improving student interaction and engagement (Dumford and Miller, 2018; Xie et al., 2019).

Furthermore, pedagogical innovations have played a crucial role in this process. Wang (2018) argues that pedagogy in online teaching has advanced beyond mere knowledge transmission to incorporate constructivist approaches, where learning is conceived as an active and collaborative process. This shift has led to an increase in the use of strategies such as project-based learning and gamification, enriching the online educational experience (González-Domínguez et al., 2020; Yu, 2022).

### Impact of the COVID-19 pandemic

The COVID-19 pandemic has been an unprecedented catalyst in the adoption and expansion of online education. Moreira-Choez et al. (2023) highlight how the pandemic forced educational institutions at all levels to rapidly adopt virtual teaching modalities, resulting in a significant acceleration in the adoption of educational technologies. This shift, although initially driven by necessity, has revealed the potential of online education to provide flexibility and accessibility in adverse circumstances.

The pandemic has also transformed traditional educational practices. According to Alqahtani and Rajkhan (2020), the rise of online teaching during the pandemic has led to a reevaluation of pedagogical methods. Educators have been forced to reconsider and adapt their approaches to maintain engagement and effectiveness in a virtual environment. This has included the adoption of digital tools for assessment, fostering online interaction, and integrating multimedia resources to enhance understanding and retention of knowledge.

### Teaching competencies in online education

Online teaching requires a set of specific competencies, which differ in certain respects from face-to-face teaching. These competencies include not only the technical skill to handle digital tools but also the ability to design and implement pedagogical strategies adapted to the virtual environment (Falloon, 2020; Loureiro and Bettencourt, 2014). The effectiveness of an online educator largely depends on their ability to foster participation, facilitate collaboration, and maintain a motivating and accessible learning environment. Teachers' perception and experience in virtual environments

Teachers' perception and experience in virtual learning environments are diverse. Many educators experience an initial learning curve when adapting to online technologies and methodologies (Garrison and Kanuka, 2004; Kumar et al., 2020). However, they also report significant professional development in acquiring new skills and competencies (Boahin and Hofman, 2014; Zimmer and Matthews, 2022). Interaction and constant feedback with students are crucial for continually adapting and improving their online teaching practices.

### Impact of online teaching on teaching practice

The adoption of online teaching has transformed teaching practice in several aspects. It has required educators to reevaluate their pedagogical methods, promoting more student-centered and competency-based approaches (El Miedany, 2019). Additionally, online teaching has facilitated the inclusion of open educational resources and digital teaching materials, which has expanded the possibilities for teaching and learning (Luo et al., 2020). However, this change has also presented challenges, such as the need to effectively manage time and resources, and ensure equity in access to technology and content for all students.

## Materials and Methods

In the current study, a quantitative methodology with a non-experimental descriptive and explanatory design was adopted, aimed at evaluating the characteristics and perceptions of 595 teachers from the State University of Milagro. Through a meticulous selection process, a representative sample of 277 teachers was defined, allowing for statistical inferences with a high degree of confidence and precision.

For data collection, a structured survey based on the instrument proposed by Martin et al. (2021), was chosen, recognized for its effectiveness in researching key elements in online teaching. This instrument was selected for its ability to comprehensively cover the experiences and perceptions of teachers in their educational work, covering variables

such as the use of digital technologies, pedagogical strategies in virtual environments, and the challenges that emerged during the transition to the online teaching model. Compliance with informed consent was an indispensable requirement to ensure the ethics and validity of the research. The distribution and collection of the surveys were carried out through Google Forms, promoted via links on WhatsApp, in order to optimize the response rate and the convenience of the participants.

For tabulating and analyzing the obtained results, SPSS software version 21 was used. This tool provided the necessary resources for a comprehensive and accurate statistical analysis, significantly contributing to the interpretation of the collected data.

## Results and discussion

In this section, we present the findings derived from the implementation of a survey directed at a representative sample of teachers. The statistical analysis focused on the use of the Chi-square test ( $\chi^2$ ) to examine the distribution and comparison of responses based on key demographic and professional variables.

Table 1. Chi-square analysis of demographic variables

Demographic Variable	Chi-Square ( $\chi^2$ )	Degrees of Freedom (df)	p-Value
Gender	3.60	2	.46
Academic Rank	4.30	3	.23
Years of Experience in Online Teaching	6.20	5	.28
Type of Learning Environment	3.50	3	.32

Table 1 presents the Chi-square results of a study on online education, examining gender, academic rank, experience in online teaching, and type of learning environment. The findings indicate a balanced gender distribution ( $\chi^2 = 3.60$ ,  $p = 0.46$ ) and academic rank ( $\chi^2 = 4.30$ ,  $p = 0.23$ ), suggesting that the sample is representative and not biased towards a specific gender or academic rank. Moreover, the experience in online teaching ( $\chi^2 = 6.20$ ,  $p = 0.28$ ) shows a wide diversity, ranging from novices to experts, providing a comprehensive understanding of online educational practices. Lastly, the uniformity in types of learning environments ( $\chi^2 = 3.50$ ,  $p = 0.32$ ) reinforces the applicability of the results to various online teaching contexts. These results collectively strengthen the validity and generalizability of the study's findings, ensuring they reflect a broad range of experiences and contexts in online education.

The following section addresses the results represented in Figure 2, focusing on teachers' perceptions regarding subject matter expertise competencies in educational contexts. This evaluation is crucial for understanding how educators value and perceive their own mastery of the content they teach, a critical aspect in the effectiveness of teaching.

Figure 2. Comparative evaluation of teaching competencies in course design

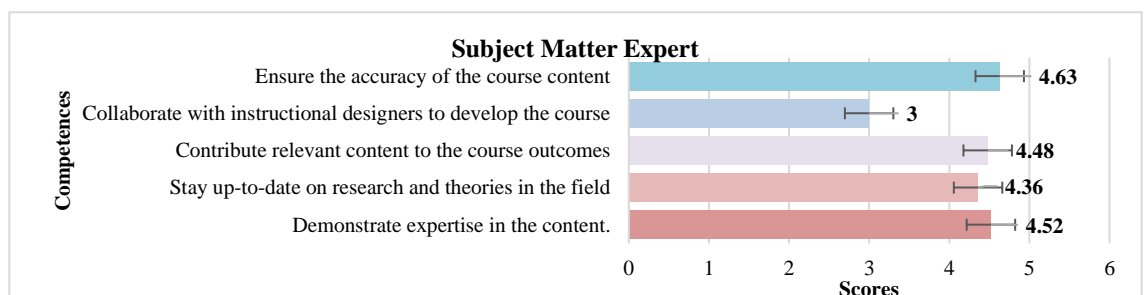


Figure 2 reveals a detailed analysis of competencies in online education, rated on a scale of 0 to 6. Notably, 'Ensure the accuracy of the course content' scores the highest with an average of 4.63, a result that reflects the priority of content integrity in online teaching. This finding aligns with the current literature, such as Jeong and Yeo (2014), emphasizing the importance of truthfulness and updating of content in virtual education. This focus on content accuracy is deemed critical by Naveed et al. (2020), who consider it essential for the effectiveness of online learning.

In contrast, the competency 'Collaborate with instructional designers to develop the course' records the lowest score, around 3, suggesting an area for improvement in incorporating interdisciplinary skills in curriculum design. This aspect is consistent with the perspectives of Wallace and Priestley (2011), who underscore the importance of collaboration in course development. Furthermore, Sugar and Luterbach (2016) highlight that collaboration with instructional designers is crucial for creating high-quality educational materials.

The analysis also underscores the importance of staying constantly updated on research and theories in the field, a point emphasized by Kane et al. (2004), who associate this with professionalism and commitment to educational excellence. This continuous professional development and critical reflection on practice are vital for educators to maintain ongoing learning. In this context, Van Driel (2021) highlights the relevance of contributing pertinent content and demonstrating expertise in it, introducing the notion of pedagogical content knowledge as a key differentiator in expert teaching.

The following section presents in detail in Figure 3 the results relating to teachers' competencies in designing and developing courses. This analysis is essential to understand the effectiveness and preparedness of educators in creating and structuring study programs, a fundamental aspect in the context of contemporary education.

Figure 3. Assessment of competencies for effective design of online courses

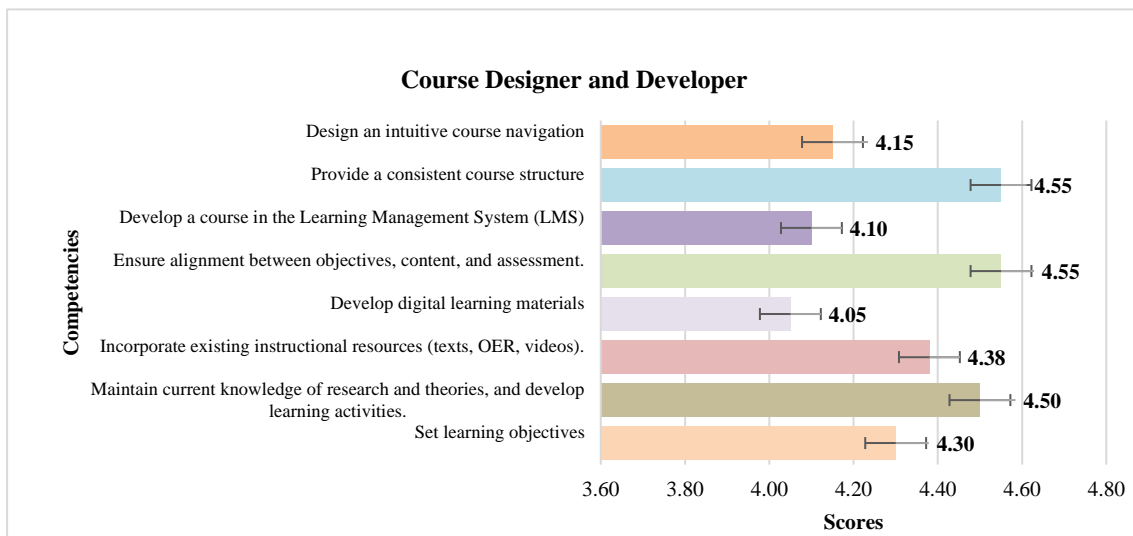


Figure 3 displays the results of a study on teaching competencies in the design and implementation of online courses, represented through a bar chart with scores ranging from 3.60 to 4.60. It's noteworthy that competencies such as 'Provide a consistent course structure' and 'Ensure alignment between objectives, content, and assessment' receive the highest ratings, approximately 4.55. These findings align with the literature emphasizing the importance of a coherent structure and content alignment for the success of online learning, as indicated by Maki et al. (2023) and Rogerson-Revell (2015).

On the other hand, the competency 'Develop digital learning materials' receives the lowest score, around 4.05, indicating a need for further training in this area. This result is

consistent with the findings of Harris et al. (2009) regarding the inherent complexity of creating effective digital materials, which require technical skills and a deep understanding of learning processes in digital environments.

The competencies 'Incorporate existing instructional resources' and 'Develop learning activities' also achieve high scores, with 4.38 and 4.50, respectively, highlighting the importance of integrating open educational resources and creating activities that promote active learning, in line with constructivist theories by Grabinger and Dunlap (1995) and Kalamas Hedden et al. (2017).

In this case, Figure 4 presents the results related to competencies as a facilitator of online courses. This graph details the evaluation of various essential skills for the effective facilitation of virtual courses. Among the assessed aspects are the ability to promote student interaction and participation, the skill to adapt materials and activities to individual needs, and effectiveness in managing course time and resources.

Figure 4. Assessment of pedagogical competencies in online learning environments

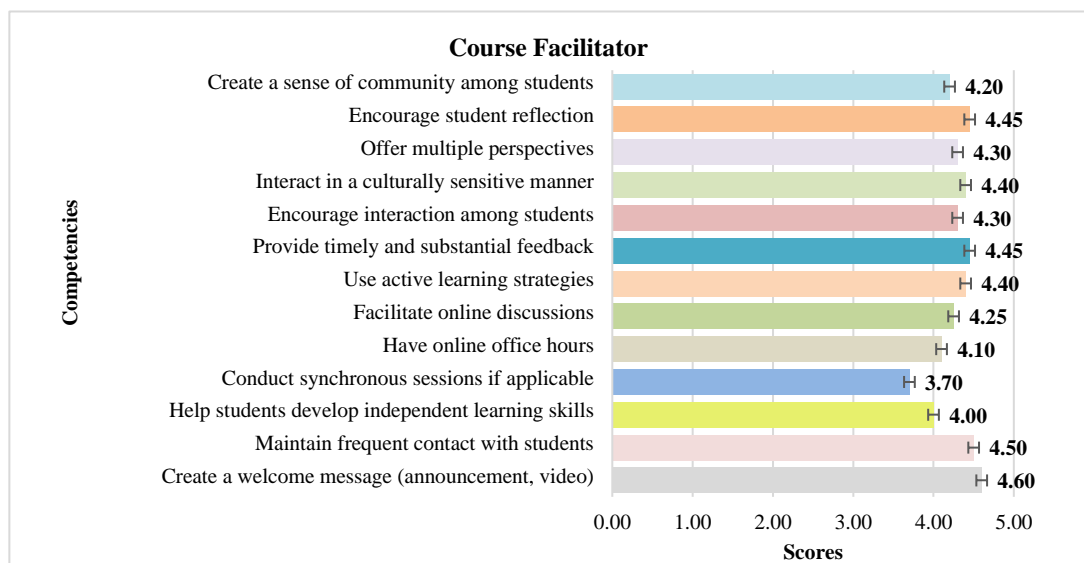


Figure 4 presents an analysis of pedagogical competencies in online learning contexts, with scores ranging from 3.70 to 4.60 on a five-point scale. When analyzing these data, it is identified that competencies such as 'Create a welcome message (announcement, video)' and 'Maintain frequent contact with students' achieve the highest scores, with 4.60 and 4.50, respectively. These results align with existing studies that emphasize the importance of clear communication and constant instructor presence at the beginning of an online course as key factors in improving student engagement and retention, as indicated by Jung and Lee (2018).

On the other hand, the competency 'Conduct synchronous sessions if applicable' receives the lowest score, suggesting a lower prioritization of real-time synchronization in online learning. This finding is in line with research indicating that, although synchronous sessions can increase social presence and engagement, they can also introduce time and accessibility limitations for students, as noted by Dahlstrom-Hakki et al. (2020).

Likewise, competencies that promote interaction and a sense of community, such as 'Encourage student reflection,' 'Offer multiple perspectives,' and 'Interact in a culturally sensitive manner,' receive high ratings. This aligns with Vygotsky's social constructivist theory, which highlights the relevance of social interaction in the learning process (Blunden, 2014).

In addition, the emphasis on meaningful feedback practices ('Provide timely and substantive feedback') and the promotion of student reflection align with the principles of

formative feedback, recognized as an effective means of improving student understanding and performance, as suggested by Wanner and Palmer (2018). These aspects underscore the importance of a comprehensive and reflective approach to online teaching, highlighting the need for pedagogical strategies that facilitate interaction, active participation, and constructive feedback.

In this section, Figure 5 illustrates competencies related to course management in online learning environments. This analysis covers a range of key skills and capabilities necessary for the effective administration of virtual courses.

Figure 5. Assessment of key competencies for course managers in virtual learning environments

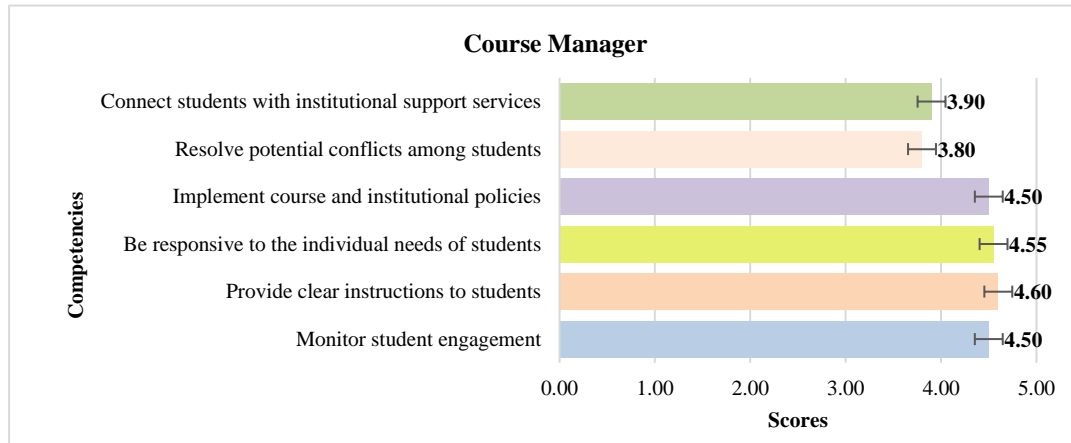


Figure 5 presents a detailed analysis of competencies assessed for a Course Manager in a learning context, presumably online, using a five-point scale. It is observed that competencies such as 'Being responsive to individual student needs,' 'Providing clear instructions to students,' and 'Monitoring student participation' receive the highest ratings, surpassing 4.5 points. These results underscore the relevance of personalization and clarity in online learning management, aspects supported by literature emphasizing the adaptation of teaching to individual needs to improve student satisfaction and performance, as suggested by Mikić et al. (2022).

In contrast, the competency 'Resolve potential conflicts among students' receives a slightly lower score, which could be interpreted as a lower prioritization of this function compared to direct facilitation of learning and interaction. This finding aligns with research indicating that conflict management, while important, is a less frequent function in online classroom management, according to Alvarez et al. (2022).

On the other hand, the competency 'Connect students with institutional support services' receives a lower rating of 3.90. This could indicate that, while recognized as valuable, this function is perceived as less immediate or directly impactful on student learning compared to day-to-day course interactions, as suggested by Muthuprasad et al. (2021).

Regarding the competency 'Apply course and institutional policies,' a high rating of 4.50 has been assigned, highlighting the importance of consistency and fairness in policy implementation. This aspect is crucial for maintaining academic integrity and justice in online education, as stated by Gottardello and Karabag (2022). Together, these results offer a comprehensive view of key competencies for effective course management in online environments, highlighting both areas of strength and opportunities for professional development for course managers in virtual settings.

In the next section, Figure 6 illustrates a detailed analysis of the competencies required for an advisor or mentor in virtual teaching. This analysis encompasses an assessment of essential skills and capabilities for effectively guiding students in online learning environments.

Figure 6. Assessment of advising and mentoring competencies in online education

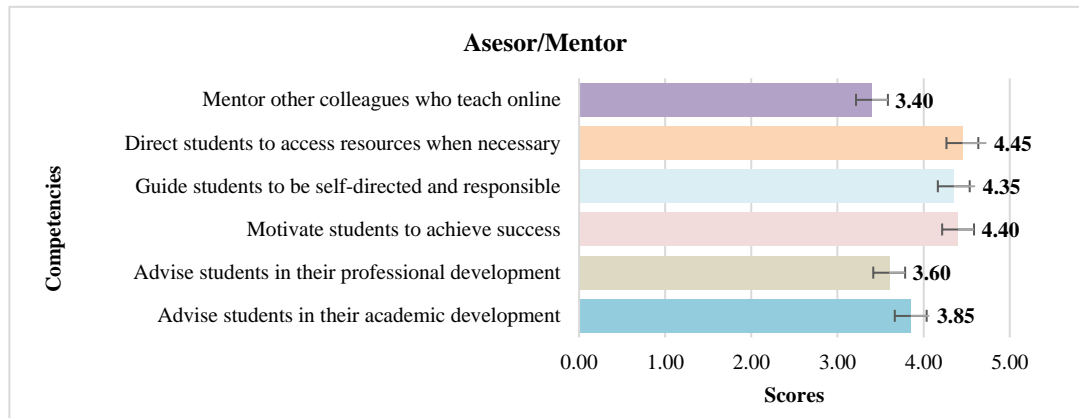


Figure 6 presents an analysis of competencies assessed for an Advisor/Mentor in online education, using a five-point scale. It is observed that competencies such as 'Guide students to access resources when needed' and 'Motivate students for success' receive the highest ratings, with approximate scores of 4.45 and 4.40, respectively. These results emphasize the importance of guidance and motivation in virtual education, aspects supported by literature that identifies resource access and motivation as critical factors for student success in online learning environments, as indicated by Barclay et al. (2018).

Additionally, the competency 'Guide students to be self-directed and responsible' achieves a high rating of approximately 4.35, underscoring the relevance of promoting student autonomy, an essential skill in distance education where students often manage their own time and learning, as suggested by Fotiadou et al. (2017).

On the other hand, competencies such as 'Mentor other colleagues teaching online' and 'Advise students in their professional development' receive lower scores, around 3.40 and 3.60, respectively. This could be interpreted as a signal that, while important, these facets of mentoring may be considered less immediate or critical compared to the need for guidance and direct academic support to students, according to Horstmanshof and Zimitat (2007).

The competency 'Advise students in their academic development' falls in the intermediate range with a score of approximately 3.85, indicating that this skill is valued but not as much as guidance for resource access or motivation for success.

These results suggest that in virtual education, there is a particular focus on direct student support that facilitates resource access and promotes motivation and self-regulation. Meanwhile, peer mentoring and professional development are recognized as important but may be viewed as complementary aspects. This approach aligns with research highlighting the importance of structured and personalized support for students in online learning environments, as suggested by Scheepers and Van den Berg (2023). These findings are relevant for educational institutions in developing training programs for online advisors and mentors, ensuring that these roles are adequately prepared to meet the primary needs of students in these key areas.

Next, Figure 7 not only represents a set of data but also reflects an analysis of evaluator competencies. Through this analysis, the aim is to identify patterns, trends, areas of strength, as well as areas for improvement in the assessed competencies.



Figure 7. Assessment of competencies for evaluators in online education

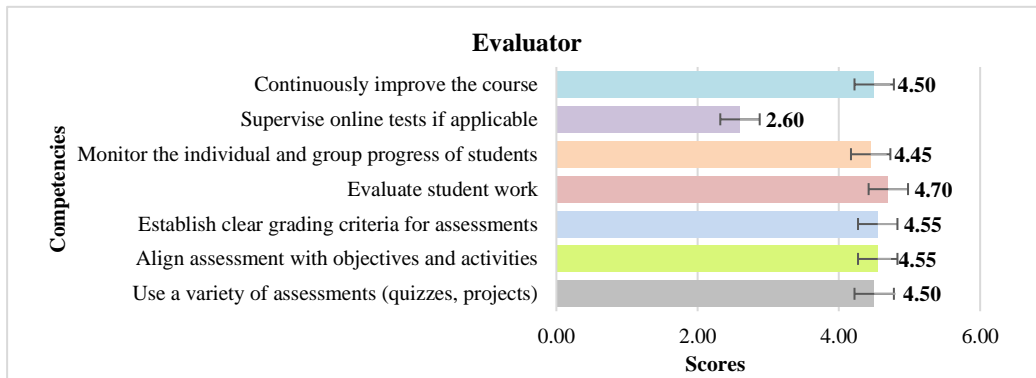


Figure 7 presents an assessment of the competencies of an Evaluator in the context of online education, using a six-point scale. It is observed that the competency 'Evaluate student work' receives the highest score, with 4.70, highlighting the primary importance of learning assessment in online teaching. This result is consistent with the research of Gordon and McGhee (2019), which emphasizes the relevance of formative assessment as a tool to improve both learning and teaching.

Additionally, competencies such as 'Establish clear grading criteria for assessments' and 'Align assessment with objectives and activities' also receive high ratings, with scores of 4.55. These findings underscore the need for transparency and alignment in assessment processes, crucial aspects to ensure validity and equity in learning assessment, as suggested by Moreira-Choez et al. (2023).

The competency 'Use a variety of assessments' receives a score of 4.50, suggesting the importance of implementing diversified assessment methods. This aligns with the perspective of Castro-Castillo et al. (2023), who argue that using different forms of assessment is essential to address diverse learning styles and competencies.

However, 'Monitor online exams if applicable' receives a significantly low score of 2.60, which could indicate that this competency is perceived as less relevant or presents greater challenges. This may reflect issues associated with the supervision of online exams, such as test security and integrity, a topic addressed by Coghlan et al. (2021).

Finally, the competency 'Continuously improve the course' achieves a high rating of 4.50, which aligns with the literature on continuous improvement. Williams and Harvey (2015) point out that this is a fundamental practice of effective teaching and an essential component of quality assurance in higher education.

The section addressed next focuses on Figure 8, which consists of a comprehensive assessment of competencies for an expert in technology in the educational field. This analysis is relevant as it explores how educators perceive and value the skills necessary for the effective integration of technology in education.

Figure 8. Assessment of competencies for an educational technology expert, where educators

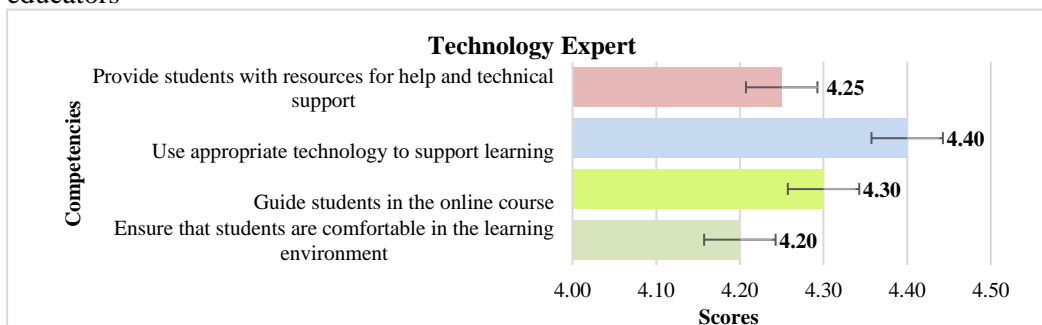


Figure 8 presents a set of competencies for an Educational Technology Expert, with scores ranging from 4.00 to 4.50. The competency 'Use appropriate technology to support learning' achieves the highest score at 4.40, highlighting the importance of selecting and employing effective technological tools for learning. This finding is consistent with the literature by Antonenko et al. (2017), which emphasizes the need to align educational technology with learning objectives and student needs.

The competency 'Guide students in the online course' receives a score of 4.30, emphasizing the relevance of guiding students in the use of technology for efficient navigation and utilization of online learning environments. This aligns with the research of Lai et al. (2016), which indicates the importance of guidance in managing technological tools for effective autonomous learning.

On the other hand, 'Provide students with resources for help and technical support' receives a score of 4.25, underscoring the importance of technical support in online education. According to Rajabalee and Santally (2021), technical support is crucial for maintaining the continuity of learning and minimizing technological frustration, essential aspects for student engagement and satisfaction.

Finally, the competency 'Ensure that students are comfortable in the learning environment' receives the lowest score at 4.20, but it is still considered significant. This can be interpreted in light of studies by Ferrer et al. (2022), which demonstrate that comfort with technology influences student motivation and participation in an online learning environment.

In the subsequent section, Figure 9 presents the results related to the competencies of a 'Lifelong Learner' in the context of education. This presentation is essential to understand how skills and attitudes associated with lifelong learning are perceived and valued, an increasingly relevant concept in modern education.

Figure 9. Assessment of lifelong learner competencies

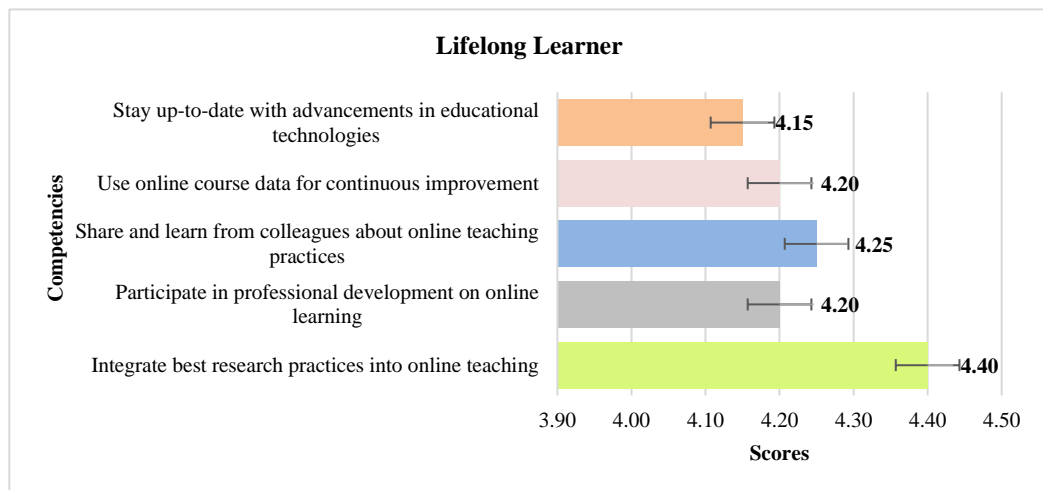


Figure 9 evaluates competencies associated with the 'Lifelong Learner' profile in the context of online education. It highlights the competency 'Integrate best research practices into online teaching' with a score of 4.40, underscoring the importance of basing instructional design on empirical evidence and research-grounded practices. This approach is consistent with the recommendations of Khatri et al. (2016) regarding the adoption of education innovations supported by robust research.

The competency 'Share and learn from colleagues about online teaching practices' receives a score of 4.25, emphasizing the value of collaborative learning and professional development among peers. This aligns with Van As (2018) theory of communities of practice, which emphasizes the importance of knowledge and experience exchange in the

educational field. Additionally, 'Staying up-to-date with advances in educational technologies' receives a score of 4.15, indicating the ongoing need for technological and professional updates that educators face in today's digital environment, as noted by Velazco et al. (2021).

On the other hand, the competencies 'Use online course data for continuous improvement' and 'Participate in professional development on online learning' both achieve scores of 4.20. These results indicate the recognition of the importance of critical reflection and continuous learning for the improvement of educational quality, in line with the principles of effective professional development proposed by Mulà et al. (2017).

Next, Table 2 provides a detailed analysis of the correlations between competencies associated with various roles in online education. This offers an in-depth perspective on how the skills required for one role may be related to or significantly differ from another. This has crucial implications for the design and implementation of online educational programs.

Table 2. Correlations between competencies of roles in online education

Role \ Role	Subject Matter Expert	Course Designer and Developer	Course Facilitator	Course Manager	Advisor/Mentor	Assessor/Evaluator	Technology Expert	Lifelong Learner
Subject Matter Expert	1.0	-0.02	-0.91	0.50	-0.56	0.23	0.20	0.25
Course Designer and Developer	-0.02	1.0	-0.24	-0.11	-0.46	-0.26	-0.38	-0.58
Course Facilitator	0.91	-0.24	1.0	0.42	-0.31	-0.12	-0.06	0.44
Course Manager	0.50	-0.11	0.42	1.0	0.13	0.56	0.62	0.36
Advisor/Mentor	0.56	-0.46	-0.31	0.13	1.0	-0.21	-0.09	0.20
Assessor/Evaluator	0.23	-0.26	-0.12	0.56	-0.21	1.0	-0.12	0.90
Technology Expert	0.20	-0.38	-0.06	0.62	-0.09	-0.12	1.0	0.54
Lifelong Learner	0.25	-0.58	0.44	0.36	0.20	0.90	0.54	1.0

Initially, a notably negative correlation (-0.91) is observed between the Subject Matter Expert and the Course Facilitator. This result suggests a divergence between the skills required for content mastery and those needed to effectively facilitate a course, supporting the distinction between content knowledge and pedagogical skills highlighted by Kind (2009).

Secondly, the negative correlation (-0.58) between the Course Designer and Developer and the Lifelong Learner indicates a potential disconnect between these areas. This

difference could signal a preference for traditional methods in course design, as opposed to more innovative and emerging approaches in online education, a central discussion in Aldosari et al. (2022) connectivism theory.

On the other hand, the moderately positive correlation (0.62) between the Course Manager and the Technology Expert suggests that competencies in online course management are increasingly linked to technological knowledge. This finding supports the idea that effective online course management requires a solid understanding of technological tools and platforms, as noted by Persico et al. (2014).

Furthermore, the high correlation (0.90) between the Advisor/Evaluator and the Lifelong Learner emphasizes the relevance of maintaining a continuous learning attitude in the evaluation process. This indicates that professionals in assessment and advising value and practice continuous learning, in line with the formative assessment perspective proposed by Pachler et al. (2010).

Finally, the moderately positive correlation (0.50) between the Subject Matter Expert and the Course Manager suggests significant overlap in skills in both roles. This implies that a deep understanding of the content can be beneficial for effective online course management, supporting the idea that subject matter expertise is a valuable component in online education administration, as suggested by Muilenburg and Berge (2005).

## Conclusions

The study provides a comprehensive understanding of multiple key aspects in online education. The obtained results offer a detailed analysis of competencies and practices in various roles within the virtual educational domain. The balanced distribution of gender and academic rank, as evidenced by the chi-square results, indicates a representative and unbiased sample, which is essential for the validity of the findings. Furthermore, the variety in online teaching experience contributes to the applicability of the results in different educational contexts.

Additionally, the importance of accuracy in course content is emphasized, aligning with existing literature on the significance of maintaining integrity and currency in virtual environments. However, the need for improved collaboration with instructional designers is identified, highlighting the relevance of incorporating interdisciplinary skills into curriculum design.

On the other hand, the significance of continuous updating in research and theories in the educational field is highlighted, establishing the need for critical reflection and constant professional development for online educators. This premise is reflected in the high ratings of competencies associated with course structure and alignment between objectives, content, and assessment.

Despite certain competencies, such as the development of digital learning materials, showing lower ratings, this points to opportunities for additional training and professional development. Additionally, the importance of integrating educational resources and designing activities that promote active learning is underscored, in line with constructivist theories.

In the realm of pedagogical competencies, there is a high valuation of practices such as creating welcome messages and maintaining regular contact with students. On the other hand, a lower prioritization of synchronous sessions is perceived, suggesting a leaning towards asynchronous modalities in online education.

Regarding the competencies of course managers, evaluators, and technology experts, they reflect the diversity and complexity inherent in online education. All of this highlights

key skills such as effective assessment of student work, appropriate technology selection, and adaptation to individual needs.

Finally, the correlations between different roles within the virtual educational environment indicate significant interactions between various competencies. This emphasizes the importance of adopting a holistic approach in online education, where skills and knowledge in different areas are integrated to facilitate an effective and enriching learning experience.

## References

- Aldosari, A. M., Eid, H. F., & Chen, Y.-P. P. (2022). A Proposed Strategy Based on Instructional Design Models through an LMS to Develop Online Learning in Higher Education Considering the Lockdown Period of the COVID-19 Pandemic. *Sustainability*, 14(13), 7843. <https://doi.org/10.3390/su14137843>
- Alqahtani, A. Y., & Rajkhan, A. A. (2020). E-Learning Critical Success Factors during the COVID-19 Pandemic: A Comprehensive Analysis of E-Learning Managerial Perspectives. *Education Sciences*, 10(9), 216. <https://doi.org/10.3390/educsci10090216>
- Alvarez, I. M., González-Parera, M., & Manero, B. (2022). The Role of Emotions in Classroom Conflict Management. Case Studies Geared Towards Improving Teacher Training. *Frontiers in Psychology*, 13. <https://doi.org/10.3389/fpsyg.2022.818431>
- Amankwah-Amoah, J., Khan, Z., Wood, G., & Knight, G. (2021). COVID-19 and digitalization: The great acceleration. *Journal of Business Research*, 136, 602–611. <https://doi.org/10.1016/j.jbusres.2021.08.011>
- Antonenko, P. D., Dawson, K., & Sahay, S. (2017). A framework for aligning needs, abilities and affordances to inform design and practice of educational technologies. *British Journal of Educational Technology*, 48(4), 916–927. <https://doi.org/10.1111/bjet.12466>
- Baran, E., Correia, A.-P., & Thompson, A. (2011). Transforming online teaching practice: critical analysis of the literature on the roles and competencies of online teachers. *Distance Education*, 32(3), 421–439. <https://doi.org/10.1080/01587919.2011.610293>
- Barclay, C., Donalds, C., & Osei-Bryson, K.-M. (2018). Investigating critical success factors in online learning environments in higher education systems in the Caribbean. *Information Technology for Development*, 24(3), 582–611. <https://doi.org/10.1080/02681102.2018.1476831>
- Blunden, A. (2014). Vygotskian Collaborative Project of Social Transformation: History, Politics, and Practice in Knowledge Construction. In *Collaborative Projects* (pp. 217–238). BRILL. [https://doi.org/10.1163/9789004261228\\_012](https://doi.org/10.1163/9789004261228_012)
- Boahin, P., & Hofman, W. H. A. (2014). Perceived effects of competency-based training on the acquisition of professional skills. *International Journal of Educational Development*, 36, 81–89. <https://doi.org/10.1016/j.ijedudev.2013.11.003>
- Brindley, J., Blaschke, L. M., & Walti, C. (2009). Creating Effective Collaborative Learning Groups in an Online Environment. *The International Review of Research in Open and Distributed Learning*, 10(3). <https://doi.org/10.19173/irrodl.v10i3.675>
- Carrillo, C., & Flores, M. A. (2020). COVID-19 and teacher education: a literature review of online teaching and learning practices. *European Journal of Teacher Education*, 43(4), 466–487. <https://doi.org/10.1080/02619768.2020.1821184>
- Castro-Castillo, G. J., Villacis Macias, C. D., Lamus de Rodríguez, T. M., & Moreira-Choez, J. S. (2023). Learning Styles and Academic Performance in Higher Education Students. *Journal of Namibian Studies*, 33(2), 4908–4924. <https://namibian-studies.com/index.php/JNS/article/view/1209>
- Coghlan, S., Miller, T., & Paterson, J. (2021). Good Proctor or “Big Brother”? Ethics of Online Exam Supervision Technologies. *Philosophy & Technology*, 34(4), 1581–1606. <https://doi.org/10.1007/s13347-021-00476-1>

- Coman, C., Țiru, L. G., Meseșan-Schmitz, L., Stanciu, C., & Bularca, M. C. (2020). Online Teaching and Learning in Higher Education during the Coronavirus Pandemic: Students' Perspective. *Sustainability*, 12(24), 10367. <https://doi.org/10.3390/su122410367>
- Dahlstrom-Hakki, I., Alstad, Z., & Banerjee, M. (2020). Comparing synchronous and asynchronous online discussions for students with disabilities: The impact of social presence. *Computers & Education*, 150, 103842. <https://doi.org/10.1016/j.compedu.2020.103842>
- Dean, A., & Lima, A. (2022). Student Experience of E-Learning Tools in HE: An Integrated Learning Framework. *Humanities Today: Proceedings*, 1(1), 29–47. <https://doi.org/10.26417/ejser.v1i1i2.p39-51>
- Diep, L. T. N., Mutlak, D. A., Kumar, T., Sapoeva, F., Hassan, I., & Sorkheh, A. (2022). An Account of University Professors' Perceptions of Educational Knowledge and Pedagogical Skills in an Individual and Online Learning Education System: A Comparative Study. *Education Research International*, 2022, 1–10. <https://doi.org/10.1155/2022/8503867>
- Dumford, A. D., & Miller, A. L. (2018). Online learning in higher education: exploring advantages and disadvantages for engagement. *Journal of Computing in Higher Education*, 30(3), 452–465. <https://doi.org/10.1007/s12528-018-9179-z>
- El Miedany, Y. (2019). e-Learning, Adaptive Learning and Mobile Learning. In *Rheumatology Teaching* (pp. 235–258). Springer International Publishing. [https://doi.org/10.1007/978-3-319-98213-7\\_13](https://doi.org/10.1007/978-3-319-98213-7_13)
- Falloon, G. (2020). From digital literacy to digital competence: the teacher digital competency (TDC) framework. *Educational Technology Research and Development*, 68(5), 2449–2472. <https://doi.org/10.1007/s11423-020-09767-4>
- Ferrer, J., Ringer, A., Saville, K., A Parris, M., & Kashi, K. (2022). Students' motivation and engagement in higher education: the importance of attitude to online learning. *Higher Education*, 83(2), 317–338. <https://doi.org/10.1007/s10734-020-00657-5>
- Fotiadou, A., Angelaki, C., & Mavroidis, I. (2017). Learner Autonomy as a Factor of the Learning Process in Distance Education. *European Journal of Open, Distance and E-Learning*, 20(1), 96–111. <https://doi.org/10.1515/eurodl-2017-0006>
- Frazer, C., Sullivan, D. H., Weatherspoon, D., & Hussey, L. (2017). Faculty Perceptions of Online Teaching Effectiveness and Indicators of Quality. *Nursing Research and Practice*, 2017, 1–6. <https://doi.org/10.1155/2017/9374189>
- Garrison, D. R., & Kanuka, H. (2004). Blended learning: Uncovering its transformative potential in higher education. *The Internet and Higher Education*, 7(2), 95–105. <https://doi.org/10.1016/j.iheduc.2004.02.001>
- Goldie, J. G. S. (2016). Connectivism: A knowledge learning theory for the digital age? *Medical Teacher*, 38(10), 1064–1069. <https://doi.org/10.3109/0142159X.2016.1173661>
- González-Domínguez, J., Sánchez-Barroso, G., Zamora-Polo, F., & García-Sanz-Calcedo, J. (2020). Application of Circular Economy Techniques for Design and Development of Products through Collaborative Project-Based Learning for Industrial Engineer Teaching. *Sustainability*, 12(11), 4368. <https://doi.org/10.3390/su12114368>
- Gordon, S. P., & McGhee, M. W. (2019). The Power of Formative Evaluation of Teaching. In *Differentiated Teacher Evaluation and Professional Learning* (pp. 15–35). [https://doi.org/10.1007/978-3-030-16454-6\\_2](https://doi.org/10.1007/978-3-030-16454-6_2)
- Gottardello, D., & Karabag, S. F. (2022). Ideal and actual roles of university professors in academic integrity management: a comparative study. *Studies in Higher Education*, 47(3), 526–544. <https://doi.org/10.1080/03075079.2020.1767051>
- Grabinger, R. S., & Dunlap, J. C. (1995). Rich environments for active learning: a definition. *ALT-J*, 3(2), 5–34. <https://doi.org/10.1080/0968776950030202>
- Harris, J., Mishra, P., & Koehler, M. (2009). Teachers' Technological Pedagogical Content Knowledge and Learning Activity Types. *Journal of Research on Technology in Education*, 41(4), 393–416. <https://doi.org/10.1080/15391523.2009.10782536>

- Horstmanshof, Louise., & Zimitat, Craig. (2007). Future time orientation predicts academic engagement among first-year university students. *British Journal of Educational Psychology*, 77(3), 703–718. <https://doi.org/10.1348/000709906X160778>
- Jeong, H.-Y., & Yeo, S.-S. (2014). The quality model for e-learning system with multimedia contents: a pairwise comparison approach. *Multimedia Tools and Applications*, 73(2), 887–900. <https://doi.org/10.1007/s11042-013-1445-5>
- Jung, Y., & Lee, J. (2018). Learning Engagement and Persistence in Massive Open Online Courses (MOOCS). *Computers & Education*, 122, 9–22. <https://doi.org/10.1016/j.compedu.2018.02.013>
- Kalamas Hedden, M., Worthy, R., Akins, E., Slinger-Friedman, V., & Paul, R. (2017). Teaching Sustainability Using an Active Learning Constructivist Approach: Discipline-Specific Case Studies in Higher Education. *Sustainability*, 9(8), 1320. <https://doi.org/10.3390/su9081320>
- Kane, R., Sandretto, S., & Heath, C. (2004). An investigation into excellent tertiary teaching: Emphasising reflective practice. *Higher Education*, 47(3), 283–310. <https://doi.org/10.1023/B:HIGH.0000016442.55338.24>
- Kebritchi, M., Lipschuetz, A., & Santiago, L. (2017). Issues and Challenges for Teaching Successful Online Courses in Higher Education. *Journal of Educational Technology Systems*, 46(1), 4–29. <https://doi.org/10.1177/0047239516661713>
- Khatri, R., Henderson, C., Cole, R., Froyd, J. E., Friedrichsen, D., & Stanford, C. (2016). Designing for sustained adoption: A model of developing educational innovations for successful propagation. *Physical Review Physics Education Research*, 12(1), 010112. <https://doi.org/10.1103/PhysRevPhysEducRes.12.010112>
- Kind, V. (2009). Pedagogical content knowledge in science education: perspectives and potential for progress. *Studies in Science Education*, 45(2), 169–204. <https://doi.org/10.1080/03057260903142285>
- Kumar, J. A., Bervell, B., & Osman, S. (2020). Google classroom: insights from Malaysian higher education students' and instructors' experiences. *Education and Information Technologies*, 25(5), 4175–4195. <https://doi.org/10.1007/s10639-020-10163-x>
- Lai, C., Shum, M., & Tian, Y. (2016). Enhancing learners' self-directed use of technology for language learning: the effectiveness of an online training platform. *Computer Assisted Language Learning*, 29(1), 40–60. <https://doi.org/10.1080/09588221.2014.889714>
- Loureiro, A., & Bettencourt, T. (2014). The Use of Virtual Environments as an Extended Classroom – A Case Study with Adult Learners in Tertiary Education. *Procedia Technology*, 13, 97–106. <https://doi.org/10.1016/j.protcy.2014.02.013>
- Lowe, H., & Cook, A. (2003). Mind the Gap: Are students prepared for higher education? *Journal of Further and Higher Education*, 27(1), 53–76. <https://doi.org/10.1080/03098770305629>
- Luo, T., Hostetler, K., Freeman, C., & Stefaniak, J. (2020). The power of open: benefits, barriers, and strategies for integration of open educational resources. *Open Learning: The Journal of Open, Distance and e-Learning*, 35(2), 140–158. <https://doi.org/10.1080/02680513.2019.1677222>
- Maki, P. L., Graff, N., Driscoll, A., Wood, S., & Shapiro, D. (2023). *Advancing Assessment for Student Success (1st Edition)*. Routledge. <https://doi.org/10.4324/9781003442899>
- Markova, T., Glazkova, I., & Zaborova, E. (2017). Quality Issues of Online Distance Learning. *Procedia - Social and Behavioral Sciences*, 237, 685–691. <https://doi.org/10.1016/j.sbspro.2017.02.043>
- Martin, F., Kumar, S., & She, L. (2021). Examining Higher Education Instructor Perceptions of Roles and Competencies in Online Teaching. *Online Learning*, 25(4). <https://doi.org/10.24059/olj.v25i4.2570>
- Matthew, U., Kazaure, J., & Okafor, N. (2018). Contemporary Development in E-Learning Education, Cloud Computing Technology & Internet of Things. *EAI Endorsed Transactions on Cloud Systems*, 169173. <https://doi.org/10.4108/eai.31-3-2021.169173>

- Mikić, V., Ilić, M., Kopanja, L., & Vesin, B. (2022). Personalisation methods in e-learning-A literature review. *Computer Applications in Engineering Education*, 30(6), 1931–1958. <https://doi.org/10.1002/cae.22566>
- Moreira-Choez, J. S., Zambrano-Acosta, J. M., & López-Padrón, A. (2023). Digital teaching competence of higher education professors: self-perception study in an Ecuadorian university. *F1000Research*, 12, 1484. <https://doi.org/10.12688/f1000research.139064.1>
- Muilenburg, L. Y., & Berge, Z. L. (2005). Student barriers to online learning: A factor analytic study. *Distance Education*, 26(1), 29–48. <https://doi.org/10.1080/01587910500081269>
- Mulà, I., Tilbury, D., Ryan, A., Mader, M., Dlouhá, J., Mader, C., Benayas, J., Dlouhý, J., & Alba, D. (2017). Catalysing Change in Higher Education for Sustainable Development. *International Journal of Sustainability in Higher Education*, 18(5), 798–820. <https://doi.org/10.1108/IJSHE-03-2017-0043>
- Muthuprasad, T., Aiswarya, S., Aditya, K. S., & Jha, G. K. (2021). Students' perception and preference for online education in India during COVID -19 pandemic. *Social Sciences & Humanities Open*, 3(1), 100101. <https://doi.org/10.1016/j.ssaho.2020.100101>
- Naveed, Q. N., Qureshi, M. R. N., Tairan, N., Mohammad, A., Shaikh, A., Alsayed, A. O., Shah, A., & Alotaibi, F. M. (2020). Evaluating critical success factors in implementing E-learning system using multi-criteria decision-making. *PLOS ONE*, 15(5), e0231465. <https://doi.org/10.1371/journal.pone.0231465>
- Noweski, C., Scheer, A., Büttner, N., von Thienen, J., Erdmann, J., & Meinel, C. (2012). Towards a Paradigm Shift in Education Practice: Developing Twenty-First Century Skills with Design Thinking. In *Design Thinking Research* (pp. 71–94). Springer Berlin Heidelberg. [https://doi.org/10.1007/978-3-642-31991-4\\_5](https://doi.org/10.1007/978-3-642-31991-4_5)
- Pachler, N., Daly, C., Mor, Y., & Mellar, H. (2010). Formative e-assessment: Practitioner cases. *Computers & Education*, 54(3), 715–721. <https://doi.org/10.1016/j.compedu.2009.09.032>
- Persico, D., Manca, S., & Pozzi, F. (2014). Adapting the Technology Acceptance Model to evaluate the innovative potential of e-learning systems. *Computers in Human Behavior*, 30, 614–622. <https://doi.org/10.1016/j.chb.2013.07.045>
- Pinargote-Macías, E. I., Vega Intriago, J. O., Moreira Choez, J. S., & Díaz Macías, T. M. (2022). Competencias del docente universitario en tiempos de pandemia. *Revista Venezolana de Gerencia*, 27(Edición Especial 7), 347–359. <https://doi.org/10.52080/rvgluz.27.7.23>
- Rajabalee, Y. B., & Santally, M. I. (2021). Learner satisfaction, engagement and performances in an online module: Implications for institutional e-learning policy. *Education and Information Technologies*, 26(3), 2623–2656. <https://doi.org/10.1007/s10639-020-10375-1>
- Rogerson-Revell, P. (2015). Constructively aligning technologies with learning and assessment in a distance education master's programme. *Distance Education*, 36(1), 129–147. <https://doi.org/10.1080/01587919.2015.1019972>
- Scheepers, L., & Van den Berg, G. (2023). Targeted and Tailored: The Importance of a Personalized Approach to Open Distance Learning Support. *International Journal of E-Learning & Distance Education / Revue Internationale Du e-Learning et La Formation à Distance*, 37(2). <https://doi.org/10.55667/ijede.2022.v37.i2.1270>
- Sepulveda-Escobar, P., & Morrison, A. (2020). Online teaching placement during the COVID-19 pandemic in Chile: challenges and opportunities. *European Journal of Teacher Education*, 43(4), 587–607. <https://doi.org/10.1080/02619768.2020.1820981>
- Sugar, W. A., & Luterbach, K. J. (2016). Using critical incidents of instructional design and multimedia production activities to investigate instructional designers' current practices and roles. *Educational Technology Research and Development*, 64(2), 285–312. <https://doi.org/10.1007/s11423-015-9414-5>
- Van As, F. (2018). Communities of practice as a tool for continuing professional development of technology teachers' professional knowledge. *International Journal of Technology and Design Education*, 28(2), 417–430. <https://doi.org/10.1007/s10798-017-9401-8>



- Van Driel, J. (2021). Developing Science Teachers' Pedagogical Content Knowledge. In *Science Teachers' Knowledge Development* (pp. 1–37). BRILL. [https://doi.org/10.1163/9789004505452\\_001](https://doi.org/10.1163/9789004505452_001)
- Velazco, D. J. M., Martínez, M. F. C., Cejas, M. N., Demera, M. H. D., & Hernández, S. M. A. (2021). The Development of Digital Competences for University Tourism Teachers. *International Journal of Learning, Teaching and Educational Research*, 20(6), 403–425. <https://doi.org/10.26803/ijlter.20.6.21>
- Wallace, C. S., & Priestley, M. (2011). Teacher beliefs and the mediation of curriculum innovation in Scotland: A socio-cultural perspective on professional development and change. *Journal of Curriculum Studies*, 43(3), 357–381. <https://doi.org/10.1080/00220272.2011.563447>
- Wang, M. (2018). *E-Learning in the Workplace*. Springer International Publishing. <https://doi.org/10.1007/978-3-319-64532-2>
- Wanner, T., & Palmer, E. (2015). Personalising learning: Exploring student and teacher perceptions about flexible learning and assessment in a flipped university course. *Computers & Education*, 88, 354–369. <https://doi.org/10.1016/j.compedu.2015.07.008>
- Wanner, T., & Palmer, E. (2018). Formative self-and peer assessment for improved student learning: the crucial factors of design, teacher participation and feedback. *Assessment & Evaluation in Higher Education*, 43(7), 1032–1047. <https://doi.org/10.1080/02602938.2018.1427698>
- Williams, J., & Harvey, L. (2015). Quality Assurance in Higher Education. In *The Palgrave International Handbook of Higher Education Policy and Governance* (pp. 506–525). Palgrave Macmillan UK. [https://doi.org/10.1007/978-1-137-45617-5\\_27](https://doi.org/10.1007/978-1-137-45617-5_27)
- Xie, H., Chu, H.-C., Hwang, G.-J., & Wang, C.-C. (2019). Trends and development in technology-enhanced adaptive/personalized learning: A systematic review of journal publications from 2007 to 2017. *Computers & Education*, 140, 103599. <https://doi.org/10.1016/j.compedu.2019.103599>
- Yu, Z. (2022). Sustaining Student Roles, Digital Literacy, Learning Achievements, and Motivation in Online Learning Environments during the COVID-19 Pandemic. *Sustainability*, 14(8), 4388. <https://doi.org/10.3390/su14084388>
- Zimmer, W. K., & Matthews, S. D. (2022). A virtual coaching model of professional development to increase teachers' digital learning competencies. *Teaching and Teacher Education*, 109, 103544. <https://doi.org/10.1016/j.tate.2021.103544>