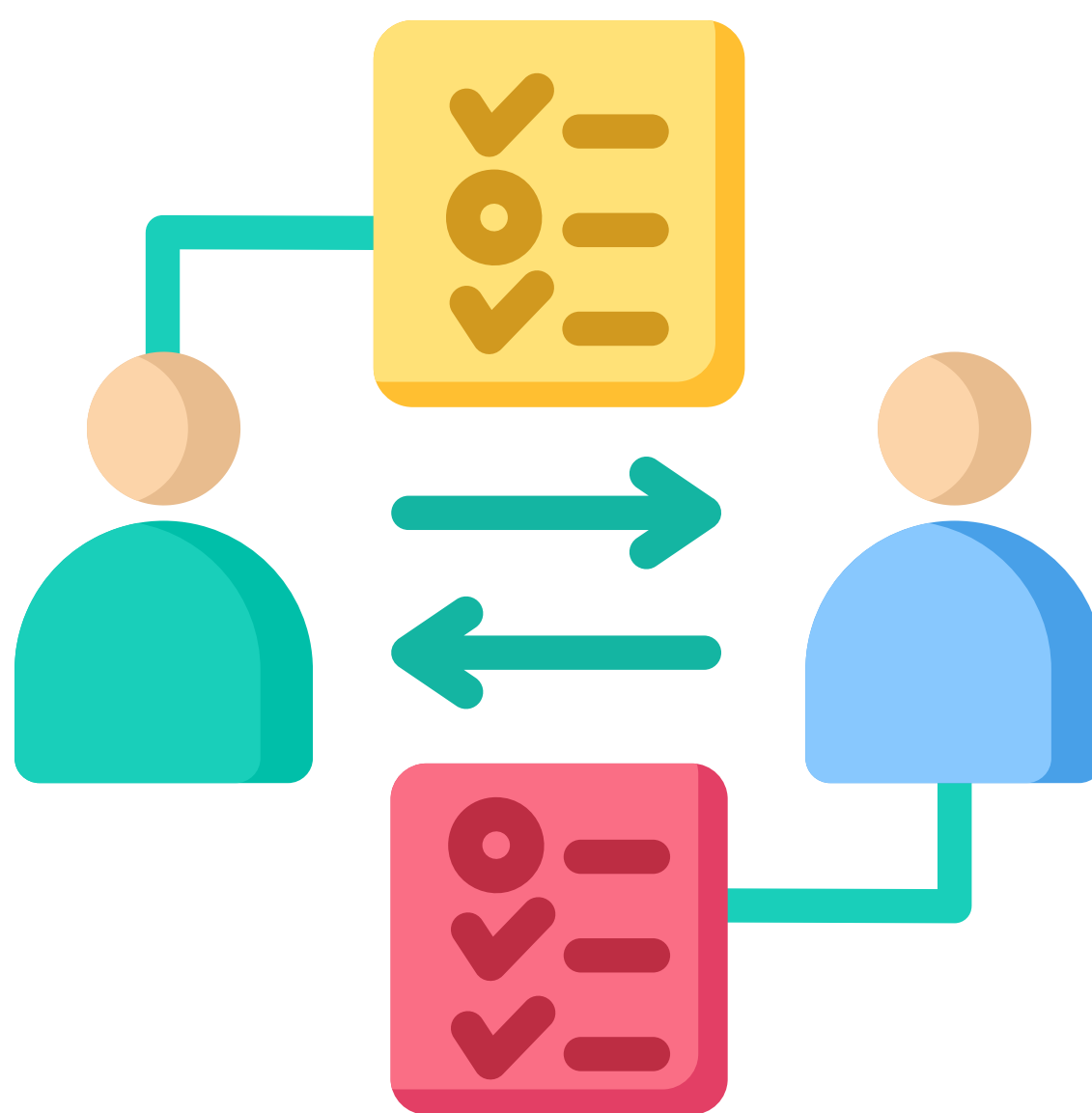


# Transforming learning in higher education: authentic assessment practices and policy implications

A systematic review of the literature, in the context of the project:

# AAFFT

ALTERNATIVE ASSESSMENT & FORMATIVE FEEDBACK TOOLKIT



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Community  
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# 2024

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## Abstract

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One of the primary goals of higher education institutions is to equip their graduates with essential skills to be successful in the future labor market. In pursuit of this goal, this review is concentrated on the implementation of authentic assessment methods, which involve the application of real-world tasks to assess students' knowledge, skills, abilities, and attitudes in a way that closely mirrors or replicates actual situations in which those skills would be utilized. As the scientific field of authentic assessment is ever maturing, this review attempts to systematically examine the literature that is relevant to this field with a focus on higher education. A qualitative method was applied and results were synthesized using multiple inclusion criteria. The main objectives of this article are to identify the patterns concerning authentic assessment in higher education, as well as the best practices and authentic assessment methods, and study their impact on enhancing the learning experience of the students. Out of an initial set of related publications, a final sample of 94 key articles was identified, following the predefined inclusion criteria. On balance, results indicate that authentic assessment has a positive impact on students' learning by engaging university students in the evaluating process and assisting them in developing crucial employability skills of the 21st century. Such valuable evidence also provides potential options and pathways for future research. Most significantly of all, the current study also delves into the critical practical and policy implications and recommendations stemming from the thematic analysis.

## Keywords

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Authentic assessment, authenticity, employability, performance assessment, higher education, online education, systematic literature review, skills of the 21st century.



# Table of contents

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## AAFT

ALTERNATIVE ASSESSMENT & FORMATIVE FEEDBACK TOOLKIT

<b>Section</b>	<b>Title</b>	<b>Page</b>
<b>1</b>	<b>Introduction</b>	<b>4</b>
<b>2</b>	<b>Theoretical background</b>	<b>6</b>
<b>3</b>	<b>Framing the rationale of the review</b>	<b>7</b>
<b>4</b>	<b>Materials &amp; methodological approach</b>	<b>11</b>
<b>5</b>	<b>Results &amp; Discussion</b>	<b>16</b>
<b>6</b>	<b>Limitations, practical and policy implications and recommendations</b>	<b>29</b>
<b>7</b>	<b>Conclusion</b>	<b>32</b>
	<b>References</b>	<b>34</b>



# 1. Introduction

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Higher education is currently undergoing significant transformations due to several factors, including: a) the rapidly evolving technological landscape, b) the disruption of the educational process during the COVID-19 pandemic, and c) the urgent demand from employers for a highly skilled graduate workforce. An intrinsic and mandatory component of the educational process is assessment, which is considered an integral part of learning (Murphy et al., 2017). Assessment measures students' knowledge, abilities, and skills and can be either formative, through continuous modes and feedback, or summative, through mid-semester or end-of-semester examinations.

Beyond traditional product-oriented methods of evaluating student progress, there are process-oriented approaches, such as authentic assessment (Sutadji et al., 2021). Authentic assessment goes beyond written assignments, paper-based quizzes, and scored exams. It involves designing activities that approximate real-world markets and challenges graduates may encounter in their careers. Unlike traditional assessments that focus on memorization, authentic assessment evaluates students' ability to apply knowledge and skills in practical ways. Students engage in meaningful tasks, demonstrating conceptual and analytical understanding of complex problems and generating solutions. Authentic assessment features criterion-based or open-ended assignments, requiring students to construct extended answers, perform actions or create digital artifacts, participate in debates, prepare oral presentations, or produce artifacts in real-world or simulated situations.

In contemporary educational settings, authentic assessment has gained significant attention from researchers, scholars, instructors, and practitioners, in both face-to-face (Petre, 2017) and online settings (Sutadji et al., 2021; Shikwaya & Amadhila, 2023). However, it remains a challenging and complex topic in educational practice. The constant emergence of novel themes and challenges makes the field particularly fascinating. This study delves into the concept of authentic assessment and investigates its key elements to provide practical implications and policy recommendations for higher education.





The purpose of this review is to identify relevant prior research focused on authentic assessment for evaluation and feedback purposes and to analyze the results in comparison to previous findings. The research questions guiding the literature review analysis are:

- Research question 1: What are the patterns concerning authentic assessment studies in higher education?
- Research question 2: How can the best practices and methods for designing and incorporating authentic assessments in higher education be identified?
- Research question 3: How can authentic assessment enhance student learning in higher education?

This review is organized into the following sections: Section 2 offers theoretical support by analyzing major concepts from theorists and researchers on authentic assessment. Section 3 addresses relevant literature reviews, conceptual papers, and reflective essays on applying authentic assessment in higher education, exploring research gaps that need investigation. Section 4 describes the research methodology, including the search process, selection criteria, data collection, and analytical procedures. The results are discussed in Section 5, organized by research questions to highlight key themes in the evidence-based literature. Finally, Section 6 suggests the need to transition from traditional to postmodern forms of assessment and presents a future research agenda. It also provides practical and policy implications for theorists, institutional authorities, policymakers, faculty, staff, and practitioners aiming to design and implement effective authentic assessment techniques





## 2. Theoretical background

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While many authors have noted that the concept of authentic assessment is not new and has evolved significantly over the years, others have highlighted various aspects of its authenticity as a core pillar (Gulikers, Bastiaens & Kirschner, 2004; Mueller, 2005; Ashford-Rowe et al., 2014; Villarroel et al., 2018). However, there is an acknowledged lack of conceptual clarity and connectivity among these authors. Many scholars use the term “alternative assessment” instead of “authentic assessment” (Kong & Yuen, 2022; Bakar & Sulaiman, 2023). Although authentic assessment is being introduced into business school curricula, it remains in an embryonic state (Manville, Donald, & Eves, 2022). The main purpose of incorporating authentic assessment into modern curricula is to prepare students for skill acquisition and work-readiness after graduation (Sotiriadou et al., 2020). This approach contrasts with traditional invigilated assessments that focus on memorization and recall of information with limited real-world applicability.

Authentic assessment is rooted in Piaget’s (1974) belief that learners must be actively involved in the learning process and the Situated Learning Theory (Lave, 1988). It also draws on the social nature of knowledge and social constructivist perspectives that emphasize constructing knowledge through meaningful and authentic activities (Kasimatis & Papageorgiou, 2021). O’Malley and Valdez (1996) refer to authentic assessment as criterion-referenced assessment, not dictated by standardized measures, defining it as “multiple forms of assessment that reflect student learning, achievement, motivation, and attitudes on instructionally-relevant classroom activities” (p. 4). Ivy, Hay, and Ritenour (2023) agree, describing it as “an assessment requiring students to use the same competencies, combinations of knowledge, skills, and attitudes that they need to apply in the criterion situation in their professional life” (p. 223). These researchers agree that criteria-based situations reflect or simulate real-life scenarios that students may encounter in internships and future careers (Gulikers et al., 2004).

Several authors emphasize the performance-oriented nature of this type of assessment (Wiggins, 2011; Merrett, 2022). Collins (2022) defines authentic assessment as providing students with opportunities to perform tasks, solve problems, or express knowledge as they would in real life, aiding in their comprehension of the task’s relevance to future employment. Andreatos (2023) suggests that assessments should be pluralistic, including a variety of tests of skills, attitudes, and knowledge.

Other authors highlight the responsibility placed on students in authentic assessment. Petre (2017) describes alternative assessment as encouraging students to be innovative, original, and eager to provide and receive qualitative feedback, leading to self-regulation. Al-Zoubi (2019) emphasizes students' ability to be critical thinkers, analyzing and interpreting information, and describes authentic assessment as reflecting learners' outcomes in real situations, making them active participants in meaningful learning tasks.

Boud (2000) views authentic assessment through the lens of sustainable assessment, which meets present needs while preparing students for future learning needs (p. 151). This approach ensures long-term development and is linked to the construction of students' evaluative judgment (Bearman, Nieminen, & Ajjawi, 2023). Sustainable assessment builds on formative assessment, shifting from assessment of learning to assessment for learning (Boud & Soler, 2016) and real-world learning approaches (Archer, Morley, & Soupeez, 2021). This shift calls for educational reform, including rethinking pedagogy and curriculum, and aligns with the economic dimensions of sustainability in the workplace. Fergusson et al. (2022) emphasize the connection between authentic assessment and work-based learning, developing a framework focusing on capabilities and competencies associated with professional practice. Schultz et al. (2022) highlight the importance of lifelong learning, arguing that authentic assessment requires students to engage in contextualized, problem-based experiences, increasing their awareness of sustainability.

Some scholars attribute historical or political connotations to authentic assessment. Forsyth and Evans (2019) suggest situating students and their communities beyond the confines of the "real world," focusing on their responsibility to act in an unknown future and transforming assessment into a more inclusive practice. Vu and Dall'Alba (2014) propose an ontological perspective, facilitating students' incorporation of knowledge and skills into holistic thinking and behavior. McArthur (2023) critiques authenticity through the lens of social justice, advocating for a focus on students in relation to society rather than just task performance. Ajjawi et al. (2023) expand on McArthur's work, advocating for a broader perspective on authenticity, preparing graduates to reform or reshape the transforming world while maintaining the importance of workplace realities.

Authentic assessment should expand beyond imaginary "real world" scenarios, seeking authenticity for students and their communities. Placing students at the center of authentic assessment may better prepare them for an unknown future. Additionally, due to pandemic limitations, time-restricted invigilated examinations have been replaced by alternative assessments through online platforms (Butler-Henderson & Crawford, 2020; Kaiser, 2023), allowing students to complete exams remotely without proctoring.



For clarity, this study will use the terms “authentic assessment” and “alternative assessment” interchangeably. It adopts the view that authentic assessment is an innovative, student-centered pedagogy that equips graduate students with the knowledge, attitudes, skills, and competencies necessary to thrive in the labor market and as competitive professionals.

### 3. Framing the rationale of the present study

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In the initial stage, relevant literature reviews, conceptual papers, and reflective essays on the use of authentic assessment in higher education were examined to establish contexts and identify research gaps. A multitude of articles were analyzed, and their findings were summarized as follows, providing interesting stimuli for further research.

An early study by Vu and Dall’Alba (2014) attempted to give ontological implications to the meaning of authenticity as a quality of the educational process that engages students in becoming more fully human. They argued that authentic assessment practices should be recognized not only as tasks and behaviors but also as opportunities for students to critically interrogate their lives, interactions with others, and self-awareness. They emphasized the ontological significance of authentic evaluation in the construction of self-meaning, rather than viewing authenticity as an attribute of a particular task. This work aligns with the recent study by Lean and Barber (2022), which opposes the restricted view of authenticity to an external real-world context and argues that important aspects of students’ ontological and epistemological subjectivity are neglected. Using Habermas’s theoretical lens, they analyze self-, peer-, and negotiated assessment, and the potential of digital tools to support these processes. They advocate for holistic, ontologically, and epistemologically grounded authentic approaches to balance reliability, communicative rationality, and validity in assessments.

The paradigm shift during the COVID-19 and post-pandemic era from traditional forms of assessment to more dynamic online evaluation environments has prompted researchers to investigate the use of authentic assessment in digital contexts. Griffith (2023) highlighted the need for a transition in assessment culture from memory-dependent assessments to more meaningful evaluations. She emphasized helping students acquire competencies relevant to post-course employment, including teamwork, collaboration, leadership, conflict management, organizational, and time management skills, facilitated by digital technology. Lim, Gottipati, and Cheong (2022) conducted a meta-analysis of literature from 2011 to 2021, exploring learning technologies for authentic assessment in digital education.



They found that immersive learning technologies, such as game-based and mixed-reality tools, are highly validated but face challenges such as technology immaturity, uncertain skill transfer, and system specialization issues. Adaptive learning technologies ranked second, but ethical debates concerning their use for assessment and grading issues emerged. Ubiquitous learning technologies, despite implementation challenges, added to the authenticity of digital education.

Recent literature (Hosseini Arefian, 2023; Kaiser, 2023) suggests that technology-based and online learning requires a more student-centered approach to learning, teaching, and assessment. Teachers can design authentic assignments, give students options and responsibilities, create peer groups, provide motivation and encouragement, and prepare them with related tasks before performance. Raynault et al. (2022) emphasized the iterative process of e-authentic assessments, such as collaboration exams, recorded video presentations, PechaKucha presentations, blog posts, social media, and e-portfolios, which enhance authenticity, develop 21st-century skills, and stimulate active student learning. Nieminen, Bearman, and Ajjawi (2023) critically outlined the need to design digitally-mediated authentic assessments to prepare students for the digital world. They concluded that current authentic assessment methods are not fully “fit for purpose” in preparing students for the digital era.

Heil and Ifenthaler (2023) reviewed 114 studies and identified four major categories of online assessment modes: peer, teacher, automated, and self-assessment. Peer assessment is used in formative and summative forms through writing tasks, e-portfolios, and projects; automated assessment is frequently used in formative assessment through quizzes and standardized exercises; teacher assessment is mainly formative, applied through e-portfolios and project-based activities; and self-assessment is formative and reflective, involving e-portfolios, essays, and projects. They highlighted the effectiveness of online assessment in improving learning outcomes such as motivation, self-regulation, engagement, reflection, and satisfaction. Success factors include instructional support and transparent predefined assessment criteria.

Loureiro and Gomes (2022) investigated the impact of online peer assessment on students' learning in higher education. They found it effective in stimulating student performance, facilitating knowledge acquisition, and developing competencies such as critical thinking, metacognitive and collaborative skills, and self-awareness. Zhang, Zhang, and Liu (2021) agreed that authentic assessment tools enhance student learning, although in mathematics education, the focus remains on computational skills rather than fostering reasoning, creativity, and realistic problem-solving skills.

Other reviews have synchronized authentic assessment tasks with professional life, highlighting employability and authenticity. Sokhanvar, Salehi, and Sokhanvar (2021) demonstrated the significance of authentic assessment in enhancing learning by engaging students and positively influencing their educational goals. They emphasized the development of professional skills such as communication, collaboration, critical thinking, problem-solving, reflectiveness, self-awareness, and self-confidence. Atifnigar, Alokozay, and Takal (2020) supported these findings, noting that alternative assessment motivates and engages students, making them reflective and critical thinkers.

Villarroel et al. (2018) highlighted three core dimensions of authentic assessments: realism, cognitive knowledge, and evaluative judgment. They proposed a four-stage model considering the workplace context, designing authentic assessments on a problematized basis, engaging students in judgment criteria application, and providing formative, summative, and sustainable feedback.

Specific discipline-focused reviews, such as Maude et al. (2021) in nursing education, identified themes like clinical practice, self-assessment, and simulations. Bayley (2023) noted that healthcare professionals positively perceived authentic assessment. Monib, Karimi, and Nijat (2020) demonstrated the positive effect of authentic assessment on students' language learning performance in EFL classrooms. Sundari (2023) presented the effectiveness of various types of authentic assessment in English Language Teaching.

Nkhoma, Nkhoma, and Tu (2018) highlighted the impact of authentic assessment in accounting courses, emphasizing the development of essential skills and attributes through rubrics, reflective journals, presentations, and self/peer assessments. Ghosh et al. (2017) discussed the importance of validity and reliability in authentic assessment for seafarer education.

The major difference between this systematic literature review and past reviews is its focus on both face-to-face and online educational contexts. While previous reviews have been conceptual, reflective, or focused on specific domains, this study extends research across a wide spectrum of disciplines and educational environments. It highlights the potential of authentic assessment in various settings and its significant role in the learning process. Moreover, it discusses the practical and policy implications of incorporating authentic assessment into higher education curricula, providing a foundation for future research.



## 4. Materials and methodological approach

To minimize potential bias, a predefined review protocol was organized to answer the research questions. The literature review was conducted between November 2023 and February 2024, following the design stages outlined below.

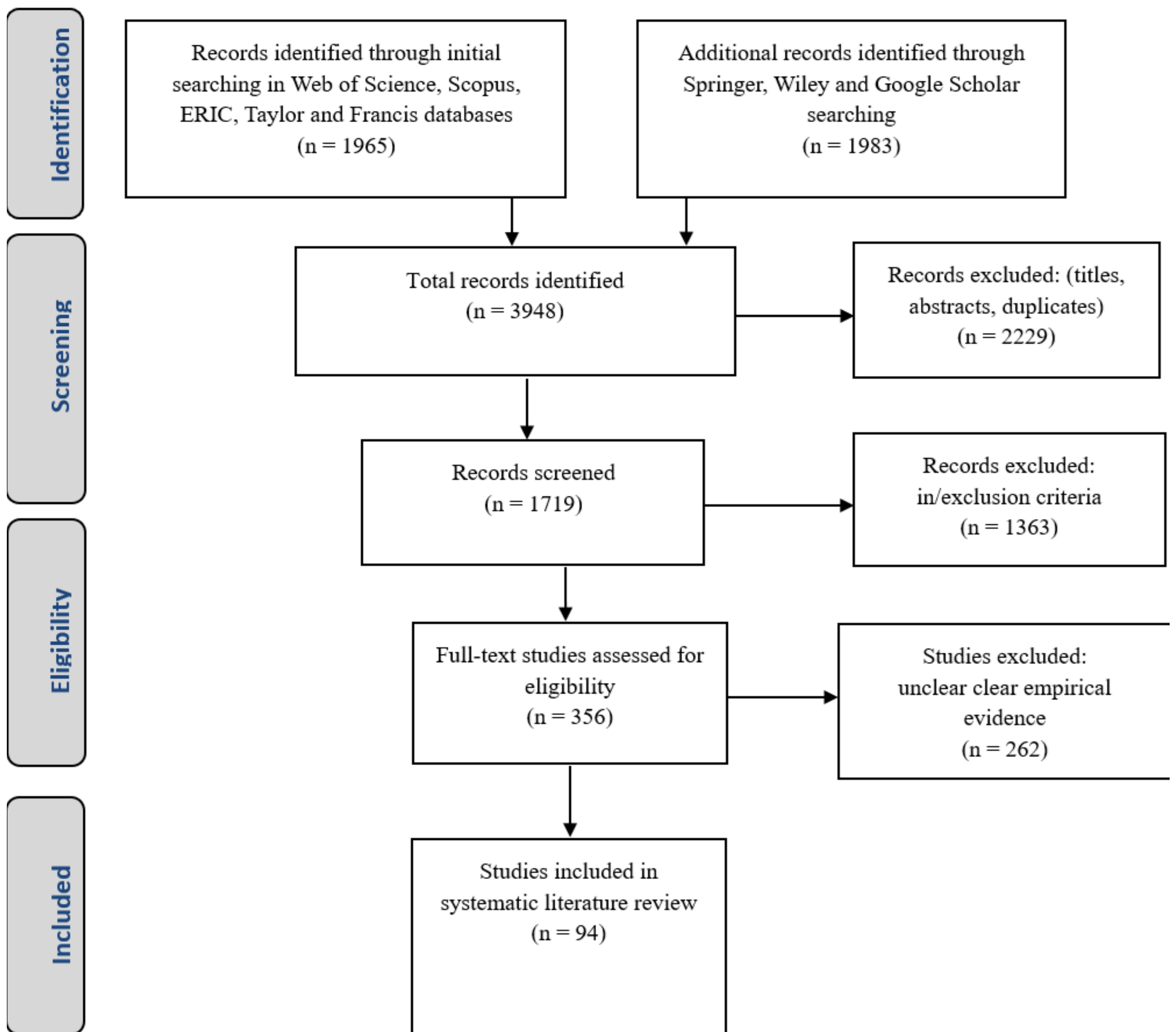
A systematic literature review of relevant studies published within the timeframe of 2014 to 2024 was performed using electronic databases, namely Web of Science, Scopus, ERIC, Taylor and Francis, Springer, Wiley, and Google Scholar. A comprehensive literature review helps identify knowledge gaps, introduce theoretical frameworks, develop conceptual frameworks, discuss key findings, generate research ideas, and evaluate research outcomes, ultimately supporting research (Sajeevanie, 2021). Reviews play a pivotal role in describing the state-of-the-art in a research field, synthesizing previous work, providing in-depth analysis, critiquing existing studies, evaluating methodologies, and proposing future research pathways. Although the concept of authentic assessment is not new, the review focused on the last decade due to a significant increase in publications related to this topic. This surge in publications, particularly after the pandemic, is attributed to the suspension of exam periods in tertiary education, mandatory detention of students and staff, and the shift from face-to-face examinations.

The PRISMA model (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) for conducting literature reviews (Moher et al., 2015; Page et al., 2021) was applied in the study, comprising the following steps: (i) search strategy, (ii) selection, (iii) quality assessment, (iv) data extraction, and (v) data synthesis.





**Fig. 1**



Flow diagram illustrating the literature review selection process



The first phase (search strategy) involved using search engines such as Google and ResearchGate to search for the term “authentic assessment” to obtain a general impression of synonymous words or phrases for this concept (see Table 1). This preliminary phase provides an overview of the current state-of-the-art and is useful for experts to draw a framework for systematic research (Linnenluecke, Marrone, & Singh, 2020). Through this preliminary phase, it was found that the concept of authentic assessment is well-defined by other researchers. Additionally, some authors used terms such as “alternative assessment,” “performance assessment,” “performance-based assessment,” and “competency-based assessment” interchangeably with “authentic assessment.” However, the terms “authentic assessment” and “alternative assessment” were the most commonly identified in the studies.

Subsequently, seven reliable online databases were consulted: Web of Science, Scopus, ERIC, Taylor and Francis, Springer, Wiley, and Google Scholar. The search string used was (“authentic assessment” OR “alternative assessment” OR “performance assessment”) AND (“effects” OR “impact”) AND “higher education.” The search focused on abstracts rather than keywords, as abstracts better represent the content of an article. This search yielded 1965 records from Web of Science, Scopus, ERIC, Taylor and Francis, and 1983 records from Springer, Wiley, and Google Scholar, totaling 3948 records (see Figure 1).

**Table 1 Key concepts and closely related concepts**

<b>Key concepts</b>	<b>Closely related concepts</b>
<b>Authentic assessment</b>	Alternative assessment, performance assessment, performance-based assessment, sustainable assessment, descriptive assessment, informal assessment, direct assessment, process assessment, process evaluation, criterion-referenced assessment, dynamic assessment, formative assessment

In the second phase (selection), the remaining 3948 publications' titles, abstracts, and duplicates were independently screened. A total of 2229 papers were excluded, leaving 1719 articles for further review. To focus on the application of authentic assessment in higher education institutions, several inclusion and exclusion criteria were established to filter out non-relevant articles. These criteria were crucial for ensuring the transparency and reproducibility of the selection process (Table 2).

**Table 2 Inclusion and exclusion criteria**

	<b>Inclusion criteria</b>	<b>Exclusion criteria</b>
<b>Study design</b>	Empirical studies (qualitative research, quantitative research, experimental, quasi-experimental, case studies, observational studies, mixed-methods research), meta-analyses, reflective papers, systematic literature reviews	Non-empirical studies, reports, editorials, thesis, doctoral dissertations
<b>Publication date</b>	Articles published between the years 2014 - 2024	Articles published before 2014
<b>Participants</b>	Aged over 18 (students, tutors, adult learners)	Ages younger than 18
<b>Type of selected articles</b>	Journal articles, book chapters, conference papers	Books, editorials, book reviews, theses, dissertations
<b>Written language</b>	English	All other languages
<b>Delivery mode</b>	Face-to-face, online education	Hybrid model of education
<b>Research themes</b>	Authentic assessment, alternative assessment, employability, authenticity, digital technologies	No reference to forms of authentic assessment, alternative assessment
<b>Education level</b>	Higher education	All other forms of education (Pre-primary education, primary education, secondary education, vocational education, adult education)

After scrutinizing each document, we excluded all those irrelevant to the study's focus or that did not meet our predetermined inclusion and exclusion criteria, resulting in the exclusion of 1363 papers. The 356 remaining full-text articles were thoroughly examined for clarity of empirical methodological evidence.

We then applied a thematic analysis procedure (see Fig. 1). Each researcher individually took notes and thoroughly read each article multiple times to understand its focus, theoretical underpinnings, methodological approach, dominant themes, and main results. Subsequently, all obtained information was compared and discussed until a consensus was reached. Of the 356 studies, 262 did not include clear empirical evidence on the use of different authentic assessment methods in higher education and were therefore excluded.

In the third phase, the quality of the data set was assessed concerning the research questions. To answer the research questions on the use of authentic assessment forms in face-to-face or online educational settings, all studies meeting the inclusion criteria were included. The final data set consisted of 94 documents, which were further analyzed to provide aggregate data on the literature review's research questions.



The thematic analysis, with a qualitative-based orientation, aimed to illustrate the concepts and definitions of authentic assessment from different authors' perspectives (Clarke & Braun, 2017; Herzog, Handke, & Hitters, 2019; Naeem et al., 2023), the factors associated with its use in the higher education evaluative process, and provide insights for practical and policy implementations and future research paths. The theoretical goal was to generate valuable ideas and specific proposals on utilizing various alternative forms of assessment, particularly in the post-pandemic norm, and how these methods could be used for future research.

Methodologically, we first portrayed the profile of the peer-reviewed articles through descriptive findings and characteristics of the dataset, such as target-group participants, publication year, geographical distribution, methodological approach, and other significant aspects. The thematic analysis led to certain derived themes. It is important to stress that there was no intentional bias in the selected studies, and while most reviewed studies were conducted in Australian regions, this reflects the selection process. There appears to be growing interest in applying authentic assessment pedagogy to evaluate student progress and the educational process as a whole.



## 5. Results and discussion

### The patterns of authentic assessment studies in higher education

This section discusses the key findings of the studies on the use of authentic assessment in higher education collected for this review and provides pertinent answers to our research questions. Of the 94 articles selected for review, the distribution by publication year is as follows: two studies in 2014 (2.1%), one study in 2015 (1.06%), two studies in 2016 (2.1%), six studies in 2017 (6.3%), eight studies in 2018 (8.5%), six studies in 2019 (6.4%), eleven studies in 2020 (11.7%), eleven studies in 2021 (11.7%), twenty-one studies in 2022 (22.3%), twenty-six studies in 2023 (27.6%), and one study in 2024 (1.06%). The amount of literature on authentic assessment has increased considerably in the past two years, and more papers are expected to be published in the coming years, especially after the pandemic crisis, as this type of assessment is the current and future trend in assessing university students.

Most of the papers were published in highly indexed international scientific journals, such as “Assessment & Evaluation in Higher Education” (n=14), “Studies in Higher Education” (n=3), “Nurse Education in Practice” (n=3), among others (see Table A1 in Appendix A). The research papers are categorized as peer-reviewed journal papers (n=80), conference papers (n=9), or book chapters (n=5). Regarding the types of papers, the majority are empirical research (n=67), followed by literature reviews/critical scoping reviews (n=19), theoretical/conceptual papers (n=5), reflective essays/papers (n=2), and meta-analysis/bibliometric analysis (n=1).

Australia and New Zealand accounted for the largest number of studies (n=22, 32.8%), followed by Asia with 21 studies (31.3%). These results reveal that researchers from Australia and Asia, especially Indonesia, have significantly contributed to authentic assessment in higher education. This is influenced by Indonesia’s 2013 curriculum, which mandates formative assessment to promote student engagement, autonomy, and critical thinking (Puad & Ashton, 2023). Similarly, Australian accreditation bodies, such as Certified Practising Accountant (CPA), require invigilated assessments, including either in-person or online examinations conducted via human or online invigilators (CPA Australia, 2023). Additionally, eight studies (11.9%) were recorded in Europe, six studies (8.9%) in American/Canadian contexts, six studies (8.9%) in African contexts, and one study (1.5%) in both Asia and Europe. Three studies did not mention their country of origin.

The empirical studies involved a total of 7,143 respondents, a large sample size. Among them, 5,639 were undergraduate, graduate, or postgraduate students, with sample sizes ranging from four to 1,176 participants. Additionally, 1,504 participants were lecturers or faculty members, with sample sizes ranging from three to 296 participants.

This comprehensive analysis highlights the global interest and diverse application of authentic assessment in higher education, reflecting its growing importance and relevance in contemporary educational practices.

Authentic assessment tasks can be integrated and applied across a variety of scientific disciplines, allowing for truly meaningful assessment in different areas of higher education without being confined to the narrow confines of a particular discipline. This type of assessment establishes meaningful connections between new knowledge learned, life skills cultivated, and their application in real-life contexts.

The data revealed that the majority of the studies (n=22) were related to Applied Science; 12 studies covered the fields of Human, Social, and Education Sciences; 18 studies focused on various STEM concepts and Healthcare Sciences; and only 2 studies were related to the Natural Sciences. Interestingly, 6 studies covered multiple disciplines, while the remaining 7 studies did not mention a specific content area. Additionally, 27 articles selected for the present study were theoretical papers and literature reviews. The representation of the areas of empirical studies recorded in this review is depicted in the following table (Table 3):

**Table 3 Discipline areas**

Subject area	Number of studies
Applied Sciences*	22
Human/Social/Education Sciences**	12
STEM subjects***	9
Healthcare Sciences****	9
Natural Sciences*****	2
Mixed*****	6
NS*****	7
Total	67

\*Includes Management, Business Administration, Financial Administration, Accounting, Marketing, Sport Studies, Applied Statistics. \*\*Includes Literature, Language and Linguistics, Philosophy, Psychology, Sociology, Social Welfare and Justice, Criminology and Law. \*\*\*Includes Science, Technology, Engineering, Mathematics, Robotics, Technology and Marketing, Computer Engineering, and Digital Electronics. \*\*\*\*Includes Medicine, Nursery, Pharmacy, and Midwifery. \*\*\*\*\*Includes Biology, Chemistry, Physics, Astronomy, and Geology). \*\*\*\*\*Studies referred to many content areas (e.g. Natural Science and Social Science, Nursing and Social Sciences, Digital Media and Medicine, Criminology/Communities and criminal Justice/Sport, Physical Activity and Health). \*\*\*\*\*Not stated.



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## Research methodological approaches

This section assesses the methodological approaches utilized in the studies included in this literature review and the assessment tools used to collect the data. The included studies reveal that research on the use of authentic assessment methods in higher education is dominated by diverse research structures that differ significantly in their methodological approaches.

Of the 67 empirical studies that met the inclusion criteria, most were qualitative studies (n=23). These primarily employed case study methodology (Merrett, 2022; Connolly, Dickinson, & Hellewell, 2023), semi-structured interviews for data collection (Ajjawi et al., 2020; Sewagegn & Diale, 2020), or focus group discussions (Thurab-Nkhosi, Williams, & Mason-Roberts, 2018; Huber et al., 2024). Other studies were based on written reflections from assessments (Wiewiora & Kowalkiewicz, 2019; Asgarova, Macaskill, & Abrahamse, 2023), observations (Dawson, Carless, & Lee, 2021), data analytics from Learning Management Systems (LMS) (Way et al., 2021), online chats (Maniram & Maistry, 2018), as well as document analysis and assessment pieces (Shikwaya & Amadhila, 2023). These qualitative studies relied on inductive thematic analysis to extract critical data for authentic assessments.

Twenty studies (n=20) utilized quantitative methods, employing questionnaires or online surveys to collect quantitative data (Keinänen, Ursin, & Nissinen, 2018; Lim, 2022), experimental factorial designs (Darma, 2017; Al-Sabbah et al., 2022), quasi-experimental designs (Chong et al., 2016), action research designs (Bakar & Sulaiman, 2023), and scenario-based designs (James & Casidy, 2018).

Additionally, twenty-two studies (n=22) used a mixed-method approach. Mixed-method studies are significant because triangulating the results improves the comprehension of the findings and thereby the validity of the conclusions (Creswell & Poth, 2016). These studies applied Likert-scale questionnaires and opinion surveys as quantitative data, open-ended interviews (van Rensburg, Coetzee, & Schmulian, 2022), semi-structured interviews (Nyinge, 2022), and focus group interviews (Carter et al., 2015). Only one study used a multi-phase approach to design and conduct an authentic assessment task and explore tutors' perceptions (Akbari et al., 2022).

**Table 4 Methods used in the reviewed empirical studies**

Methods	Frequency	Percentage %
Mixed-method	22	32.8%
Quantitative	20	29.8%
Qualitative	23	34.3%
Multi-phased approach	1	1.5%
Not mentioned	1	1.5%
Total	67	

## Authentic assessment types, modes, and methods

Several papers revealed that there are numerous authentic assessment types, methods, and techniques, and their application often depends on the instructors' teaching experience, assessment competencies, and practices. Sulaiman et al. (2020) found that lecturers from the faculties of education and medical schools who are experienced tend to use more alternative assessment methods compared with lecturers in other faculties, implying that more experienced lecturers are more likely to apply appropriate assessment practices. However, the way academic staff approaches authentic assessment implementation also depends on their colleagues' attitudes. In the Hains-Wesson et al. (2020) study, most academic participants enjoyed transforming their assessments to be more work-related, though there was no shared understanding of what reform based on authentic assessment would entail, and they felt overwhelmed when required to collaborate with others.

Authentic assessment requires specific competencies and abilities that students need to acquire to perform real work. It is imperative that students apply what they have learned in similar real-world situations. Thus, it is essential to evaluate students' practices both inside and outside the university/college classroom to properly prepare them to become efficient employees. Authentic assessment should include various techniques such as self-assessment, peer-assessment, group-assessment, practical in-class assessments, written essays, group projects, field reports, reviews of articles, portfolios, case study discussions, proposal developments, interviews, role-play exercises, and teacher observations (Sewagegn & Diale, 2020). These strategies play a crucial role in enhancing students' creativity and critical thinking, making them proficient in their learning experiences and accountable for directing positive changes in contemporary work environments (van Rensburg et al., 2022).

Peer assessment and self-assessment techniques are utilized in literature and linguistic science evaluation processes. Kaya and Özkan (2019) found that pre-service language teachers expressed a positive attitude toward these methods, which foster collaboration, interaction, and self-confidence. However, students' intense focus on assessment scores may emphasize the product rather than the process. Engaging students in activities that help them construct their knowledge and synthesize new information leads to higher levels of learning and competencies applied in authentic contexts. Eminent tutors use assessment as a learning opportunity to estimate students' efforts and evaluate their ability to bridge theory and practice (Thurab-Nkhosi et al., 2018; Wiewiora & Kowalkiewicz, 2019). In nursing education, allowing students to practice real-life skills with authentic assessments builds confidence, improves knowledge and understanding, enhances self-motivation, and fosters skill competencies (Wu, Heng & Wang, 2015; Chong et al., 2016).

21st-century graduates need elements of digital literacy and skills applicable in modern business environments. Such authenticity promotes employability and increases student satisfaction, demonstrating positive attitudes and behavioral intentions, such as promoting their subject of study to peers (James & Casidy, 2018). Collins (2022) concluded that authentic assessment experiences are positive for students, contributing to their enjoyment and deepening their subject knowledge. Nursing students' learning outcomes in cognitive, psychomotor, affective, and critical competencies were empowered through authentic assessments in clinical settings (Chong et al., 2016).

Authentic assessment tasks vary by course discipline. In law courses, students prepare for client meetings, write legal opinions, and argue court cases (Collins, 2022). In pharmacy, assessments commonly involve simulation exercises like patient interviews or counseling (Ivy et al., 2023). Business management and medical courses often use project-based learning (Wright, 2023). As medical and nursing environments become more complex, rubrics are used to enhance critical thinking and creativity, improving problem-solving skills, self-regulation, confidence, metacognition, and communication skills (Chong et al., 2016; Chong et al., 2020; Colthorpe et al., 2021; Montano et al., 2023). In health care, group activities emphasize communication, collaboration, and conflict resolution skills (Carter et al., 2015). Hospitality financial management courses also implement group activities due to the social constructivist nature of authentic assessment (Maniram & Maistry, 2018).

Instructors' perceptions of authentic assessment tools vary by discipline. Education course instructors prefer portfolios, seminar presentations, and microteaching to develop pedagogical competence, while science course instructors focus on content competence with practicum and projects (Nyinge, 2023). Applied business courses, such as logistics and supply chain management, use multi-dimensional authentic assessments like visual posters, video presentations, and case studies to foster cognitive thinking skills (Akbari et al., 2022; Nkhoma & Nkhoma, 2019).

Reflective exercises in business domains enable generic competencies for judgment and planning. In-class discussions, group projects, and problem-solving assignments aid cognitive, emotional, and communication skills development. Authentic assessment constructs converge with elements like collaboration or peer feedback, motivating students to engage in feedback processes similar to professional contexts (Carter et al., 2015; Villarroel et al., 2018; Dawson et al., 2021). Peer assessment activities allow students to evaluate work quality and manage constructive feedback, crucial in current work environments (Ketonen, Körkkö, & Pöysä, 2023).

Authentic assessment emphasizes performance over memorization, encouraging active learning for students of different backgrounds and abilities. Another notable form is simulation, used in marketing education to provide reflection, feedback, and a deeper understanding of real-world complexities (Farrell, 2020). However, unlike Ashford-Rowe et al. (2014), who argue for skill transferability across domains, students in Farrell's (2020) study did not appreciate the transferability of skills acquired in simulations to other areas.



## Technological aspects of authentic assessment

The rapid transition to online environments, driven by technological advancements and pandemics, has led to the significant adoption of online continuous assessment methods. This adoption allows for a wide range of assessment tasks similar in nature and setting to those in the industrial sector, thereby increasing the validity of assessments (Lim & Lim, 2023). Online assessments, as conceptualized by Allan (2020), are assessments mediated by digital technology and delivered online under secure conditions, such as invigilation and limited access to course materials or communication. These assessments can be delivered either synchronously or asynchronously.

Many students preferred computerized assessments during the COVID-19 crisis, as they are digital natives and familiar with digital technologies embedded in their lives, which aids their academic growth (Al-Sabbah et al., 2022). However, the use of online authentic assessments is also associated with sustainability issues. Wakefield, Pike, and Amici-Dargan (2023) concluded that digital media products, if aligned with the United Nations Sustainable Development Goals (United Nations, 2018), could create solutions to global problems, echoing McArthur's (2023) perspective that authentic assessment can activate students for positive societal change. To prepare students for sustainability challenges, increasing the authenticity of assessments in university curricula is essential (Asgarova et al., 2023). This engagement helps students develop pivotal skills for sustainability-focused careers and make a difference in their communities. Several alternative assessments can be embedded in curricula, such as in-class case analysis or problem-solving activities (Ajajawi et al., 2020), to prepare students for future employment. Digital transitions and technologies also raise students' awareness of environmental issues and develop their sustainability awareness, a key competency in a digitally transformed world (Zakopoulos et al., 2023). The assessment landscape is evolving towards more holistic and sustainable approaches, seen in disciplines like online theater. For instance, Online Reader's Theatre (ORT) offers creative opportunities in drama preparation and remote presentation, enhancing collaboration and engagement with peers and instructors (Nugent, 2021; Bakar & Sulaiman, 2023). This approach fosters deeper learning and autonomy. Gaikwad et al. (2023) identified case analysis/discussion/presentation, quizzes/MCQs, and group projects as the top preferred assessment types by learners, promoting active engagement and practical knowledge use. Conversely, teachers preferred quizzes/MCQs, viva, and online assessments (e.g., Mentimeter, Spinwheel), which focus on individual knowledge and performance. While many teachers apply online assessment strategies, few use student-preferred methods like debates, research-based assignments, simulations, seminars, and reflections, indicating a lack of awareness or understanding of these strategies.

Sotiriadou et al. (2020) advocate for interactive oral examinations in virtual business management classes. These assessments, where students interview a client and prepare a written report, improve communication skills, employability, professional identity, and awareness. The interactive nature reduces opportunities for academic dishonesty, as it is difficult to cheat in assessments requiring higher-order and critical thinking skills. This aligns with Way et al. (2021), who found that online simulations improve student behavior and learning outcomes by enabling early intervention against plagiarism and misconduct. Students are more likely to engage with peers and learning materials through lecture videos, interactive images, documents, and online forums, enhancing their engagement and interaction skills.

However, some students may engage in cheating behaviors, influenced by grade level, age, and assessment duration. Adama et al. (2023) found that younger students, particularly first-year students, are more prone to collusion and collaboration with peers. Additionally, longer assessments increase the likelihood of collaboration. These findings highlight the need for careful design and monitoring of online assessments to maintain academic integrity.

Wakefield et al. (2023) suggest replacing individually written essay assignments with learner-generated podcasts, recognizing that authentic assessments equip students with real-world relevant skills and increase their satisfaction. Podcasts are positively perceived by students, who overwhelmingly prefer them as assessment tools. They serve as a motivator, helping students develop transferable skills needed to become qualified graduates, including collaborative learning, critical debate, creativity, communication, community building, and digital media training. This diversifies the assessment landscape, particularly in virtual learning environments, and can be applied across various disciplines. Through designing e-book projects, students sharpen teamwork, collaboration, self-regulation, and creativity, becoming motivated self-publishers and self-directed learners with increased responsibility and autonomy, thereby enhancing crucial 21st-century skills.

To increase the authenticity of both synchronous and asynchronous online assessments, Sutadji et al. (2021) used various methods, including written tests with case study questions, online discussions, teacher-assessed participation, paper writing, and case study analysis. Asynchronous tools such as assignments and portfolios assess students' knowledge and skills, while synchronous assessments include portfolios, independent projects, and journals/scientific papers. Effective online assessments include discussion forums, individual or collaborative projects, self-assessments, peer evaluations, simulations, and quizzes (Gray, 2013, as cited in Sutadji, 2021). E-portfolios are also highlighted as a digital tool for authentic assessment, providing a well-organized, visually appealing record of students' academic and professional knowledge, skills, and attributes (Bearman et al., 2023; White, 2019).

Interactive oral assessments encourage students to develop professional communication and collaboration skills, preparing them for future work and promoting their professional identity by simulating workplace scenarios (Sotiriadou et al., 2020; Tan et al., 2022). These assessments help meet current and future learning needs in flexible technological environments, promoting sustainable assessment strategies (Asgarova et al., 2023). Online discussions and dialogue simulations are preferred by instructors as formative assessment methods to evaluate student learning performance (Al Ghazo, 2023). The study found that lecturers with more teaching experience possess better professional teaching and assessment skills, highlighting the need for training courses on online authentic assessment strategies for faculty.

The use of technological tools and innovative practices can improve authentic assessment designs to cultivate learners' professional competencies and digital skills. Hussain and Al Saadi (2019) showed that tech-savvy students develop technology skills and communicate more efficiently through the design of e-books. A novel skill-oriented authentic assessment approach introduced by Lim et al. (2022) and Lim et al. (2023) combines elements of gamification (G), heutagogy (H), and multimodality (M) of assessments, known as GHMA. This approach allows learners to determine their goals and create personalized multimodal artifacts through feedback from learning analytics, promoting self-reflection, self-esteem, self-efficacy, and intrinsic motivation (Chong et al., 2020). The LMS facilitates tracking student progress and access to online feedback, crucial in online education. Despite the positive impacts of online authentic assessment in higher education, challenges remain, such as concerns about academic integrity and the expectations of professional accrediting bodies regarding invigilated assessments (Holden, Norris, & Kuhlmeier, 2021). Remote online invigilation is essential for delivering and validly assessing courses while meeting professional accreditation requirements during the pandemic, with a gradual increase in innovative online assessment designs predicted (Huber et al., 2024). The International Center for Academic Integrity defines academic integrity as a commitment to six fundamental values: honesty, trust, fairness, respect, responsibility, and courage (ICAI, 2021). Extensive literature addresses academic integrity issues, particularly the role of assessment design in assuring integrity in higher education (Shikwaya & Amadhila, 2023; Huber et al., 2024). Imperfections in assessment design and a lack of instructor surveillance have been linked to academic misconduct, with the robust use of AI tools like ChatGPT inducing cheating and dishonesty (Sullivan, Kelly, & McLaughlan, 2023; Hua, 2023; Oravec, 2023). To overcome these challenges, several strategies should be introduced: preparing different questions for different students, combining various assessment methods, designing assessments suitable for remote delivery, incorporating new assessment technologies, ensuring fairness and security, and using e-proctoring software for remote invigilation (Stavride & Kokkinaki, 2023; Shikwaya & Amadhila, 2023; Kaiser, 2023).



## The impact of authentic assessments in enhancing students' 21st-century skills

One of the key characteristics of authentic assessment is the development of employability competencies relevant to or simulating real-life practices. Employability is defined as "the ability to find, create, and sustain meaningful work across the career lifespan, having the skills, knowledge, understanding, and personal attributes that make a person more likely to choose and secure occupations in which they can be satisfied and successful" (Villarroel et al., 2021). This definition emphasizes the need for students to develop metacognitive capacities for their professional lives. For example, in a social work education case study presented by O'Keefe (2020), course assessments and activities simulated real-world activities, encouraging students to see themselves as social agents responding to actual-world challenges, drawing on the knowledge, skills, and practices developed throughout their courses. Teachers used assessments as learning opportunities, evaluating students' efforts and their ability to translate knowledge into practice (Thurab-Nkhosi et al., 2018).

Prospective employers often criticize the quality of graduates entering the labor market, claiming they lack the ability to plan strategically, cope with uncertainty, or work under pressure (James & Casidy, 2018). Römgens, Scoupe, and Beusaert (2020) conceptualize employability through a multi-dimensional, competence-based approach, combining insights from higher education and workplace learning. They describe employability dimensions as including disciplinary knowledge, generic skills, social and networking skills, lifelong learning, flexibility, and metacognitive skills for reflecting on one's goals, values, ambitions, and identity. Authentic assessment provides opportunities for lifelong learning and employability, offering sustainable competitive benefits for academic institutions (Donald, Baruch, & Ashleigh, 2020). The employability agenda, with its main components, has prevailed in the business and management sciences curriculum (Manville et al., 2022). Higher education institutions are challenged to produce employable graduates by collaborating with employers to secure employment opportunities, creating career-oriented students (James & Casidy, 2018). Incorporating authentic assessment into business school curricula helps learners adapt to the evolving workplace (Thurab-Nkhosi et al., 2018), requiring academic staff to move beyond traditional norms and explore innovative assessment methods. There needs to be a linkage between the curriculum and authentic assessment methodologies to develop essential skills for real-world work settings (James & Casidy, 2018). Pallant, Pallant, and Jopp (2022) examined the impact of highly authentic client-based projects (CBPs) on student satisfaction and success rates. At the undergraduate level, highly authentic CBPs may negatively impact student satisfaction due to the challenging and ambiguous nature of the experience, whereas at the postgraduate level, it could have a positive impact if implemented effectively.



Authentic assessment plays a pivotal role in ensuring that graduate students transition easily from the learning environment to the workplace (Davidson et al., 2019). Embedding work-integrated learning in authentic assessments increases graduate employability. Journalism students, for instance, appreciate authentic assessments for their career aspirations but may lack the confidence to share their work with a broad audience (Fulton et al., 2021). Employability skills can be enhanced through problem-solving scenarios, critical thinking, and practical skills targeting specific work environments (Connolly et al., 2023). A significant feature of authentic assessment is its formative use to improve learning outcomes related to competency acquisition. A mixed-method research study found that authentic assessments, primarily portfolios and practical work, are used both formatively and summatively, despite the prevalence of summative use (Nyinge, 2022). When assessments do not involve grading, learners may not take them as seriously. While authentic assessment tools can be used formatively to improve learning and summatively to grade achievement, tutors often rely more on summative assessments (Sewagegn & Diale, 2020; Nyinge, 2023), possibly due to a lack of awareness of formative uses or a culture of traditional assessment methodologies (Sulaiman et al., 2020).

Sewagegn and Diale (2020) noted that despite the strategy to enhance student learning effectiveness, lecturers often rely on traditional methods that do not contribute to competency development. Ajjawi et al. (2020) stressed that authentic assessments must align with industry demands to establish students' professional identities. Whittam's (2023) study shows that authentic assignments empower students with practical experience and employability skills, increasing their work-readiness and motivation.

Ultimately, authentic assessment tasks focus on developing students' professionalism during and after their university studies. Educators play a crucial role in preparing students for immediate future employment, fostering their professional identities, and helping them become conscious professionals ready for the labor market.



Authentic assessment focuses on identifying professional relevance and developing transferable skills such as planning, working with others, and critical thinking (Searle & Poth, 2021). Binkley et al. (2012) categorize these skills into four groups: a) ways of thinking (creativity, innovation, critical thinking, problem-solving, decision making, learning how to learn, metacognition), b) ways of working (communication, collaboration/teamwork), c) tools for working (information and digital literacy), and d) living in the world (citizenship, life and career, personal and social responsibility, cultural awareness, and competence). Universities should connect with society's needs and promote changes necessary for cultivating 21st-century skills. However, a lack of experience among academic staff in designing assessments is an obstacle to transitioning to authentic assessment (Brown et al., 2022). Authentic assessment encourages deeper reflection on student practice, demonstrating progress throughout their studies and aiding successful labor market entry (Vargas-Mendoza, Gallardo-Córdova, & Castillo-Díaz, 2018; Archer et al., 2021).

Authentic assessment experiences and the development of transferable skills often depend on course design. For example, in an Australian engineering course, project-based learning, computer-assisted assessment, 3D printing, group projects, and peer assessment were added to develop lifelong learning skills (Pang & Kootsookos, 2021). These assessments positively affected students' learning outcomes and overall course satisfaction because they were pertinent to real-world workplace situations. Knowledge derived from these assessments supported independent and self-directed learning, leading to self-regulation skills development. Assessment formats vary by discipline; Sutandji et al. (2021) found that non-exam formats and performance tests were more common in social sciences, while natural sciences used measured tests with higher-order skill questions, significantly impacting student learning outcomes and competencies.

Kashef and Townsley (2023) highlight the importance of authentic assessment for developing higher-order thinking skills and real-world practices for future labor market entry. They surveyed faculty views on the challenges and benefits of authentic assessment, finding agreement with Villarroel et al. (2018) on engaging assessment strategies that promote higher levels of Bloom's taxonomy. However, the effectiveness of authentic assessments can be threatened by insufficient instructor support and monotonous assessment types (Kong & Yuen, 2022). Higher education institutions play a pivotal role in engaging students in real tasks while assessing critical competencies needed to solve contextualized problems using higher-order skills, preparing them to become professionals and responsible citizens (Villarroel et al., 2020).

The importance of critical thinking and higher-order thinking skills is emphasized by researchers such as Lisdawati and Umam (2022), who found that authentic assessment tasks allow students to be creative in analyzing contexts, evaluating sources, and finding solutions. Tailoring these tasks to students' needs helps develop critical thinking. Fergusson et al. (2022) emphasize reflective practice for fostering lifelong learning outcomes, focusing on the relationship between authentic assessment and work-based learning to enhance professional identity in sustainable work contexts.

Interpersonal and intrapersonal skills, such as critical thinking, creativity, communication, collaboration, and problem-solving, are crucial for student success in real-life circumstances (Juanda, 2022; Connolly et al., 2023). Professional competencies require practical content knowledge and technical skills, along with creativity, teamwork, and higher-order thinking skills (Guzzomi, Male, & Miller, 2017). For instance, case study-based projects in engineering courses yielded higher performance than build projects due to workload and scheduling demands (Merrett, 2022). Reflective authentic tasks improve leadership skills, self-efficacy, and self-concept, enhancing students' leadership identity and self-confidence (Wiewiora & Kowalkiewicz, 2019).

Innovation skills are also crucial for future leaders. Keinänen et al. (2018) evaluated an assessment tool for measuring innovation skills, concluding that creative problem-solving, goal orientation, teamwork, and networking competencies are prerequisites for a successful career. Similarly, Darma (2017) found that problem-based authentic assessment models led to higher scores in mathematical understanding and problem-solving compared to conventional learning models.

However, lecturers face constraints in performing authentic assessments focused on 21st-century skills, such as the absence of standardized measures, time limitations, multiple aspects to consider, negative student reactions, and heterogeneity in student needs and abilities (Juanda, 2022). Heavy workloads and early preparation for authentic assessments are challenging, and students often struggle to meet deadlines (Thurab-Nkhosi et al., 2018). While authentic assessments stimulate practice and significantly influence learning, they can negatively affect learners' quality achievements due to inadequate preparation (Villarroel et al., 2020). Other hurdles include diverse career paths, traditional scoring systems, and the challenge of designing appropriate assessment tasks (Schultz et al., 2022). Al-Sabbah et al. (2022) mention limitations such as the time-consuming and difficult nature of creating authentic assessments, requiring tutors to receive adequate training.

Assessment literacy among teachers is another challenge. Gaikwad et al. (2023) found that most teachers demonstrated a moderate level of assessment literacy, particularly in evaluating student performance, enhancing collaboration, assessing higher-order thinking skills, and using assessment as a learning tool. Yan and Pastore (2022) noted low levels of assessment literacy among tutors, highlighting the need for training in assessment instruments, strategies, and new approaches.

Lessons from authentic assessment in higher education can help graduate students develop entrepreneurial opportunities and career-related advantages, sharing their knowledge and experience with potential employers.

## **6. Limitations, practical & policy implications and recommendations**

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### **Limitations and future agenda**

The purpose of this paper is to evaluate the current state-of-the-art by analyzing recent literature to gain insight into the implementation of authentic assessment methods in face-to-face and online environments in higher education. The forms and practices of authentic assessment in tertiary education institutions have received significant attention in recent years, confirming a growing trend of researchers working on this topic worldwide. Papers on authentic assessment in higher education have been published in numerous scientific and educational journals, though their presence is scarce in European and African countries.

We employed the rigorous PRISMA method and conducted an extensive search of recent literature. Despite our efforts, this study had several limitations that could have threatened the validity of our work. Additionally, despite conducting multiple database searches, relevant publications may have been missed due to biases in database selection and the search strings used. As more scientific studies are published, we suggest using more engines, electronic libraries, indexes, and databases such as Academic Search Premier (EBSCO) and ProQuest to mitigate database selection bias. Furthermore, to overcome language bias, we propose including articles written in other languages in addition to English. Expanding the search to other types of publications, such as books, bachelor's theses, master's theses, doctoral dissertations, reports, and official documents, would also be beneficial. By omitting these publications, we may have missed some important empirical or literature-reviewed articles. Another considerable limitation is that several crucial parameters were neglected in some studies, such as demographic information, sample characteristics, and methodology, which could have affected the validity of the results. Future studies could also focus on other levels of education, such as K-12, secondary, vocational, and adult education, to obtain results comparable to those in higher education.



To overcome the challenges associated with the lack of reliability and consistency of qualitative research, we justified the entire review process, from the theoretical basis of the study to the research methodology to the steps and phases of selection and analysis. We aimed for objectivity in our decisions, selection, and interpretation, ensuring the trustworthiness and consistency of our work. Due to time constraints, quantitative meta-analysis was not feasible. Therefore, we suggest a bibliometric analysis in the form of network metrics, clustering, and visualization of results (Donthu et al., 2021) to enrich the present qualitative data.

Most of the empirical studies reviewed relied on students' self-reported learning outcomes and competencies, which do not always accurately reflect the actual acquisition of knowledge or skill development. For this reason, a quasi-experimental design is suggested for future research. This design should employ external measurements of student performance, specifically through authentic assessment, rather than random assignment of students to specific groups, with experimental groups engaging in pre- and post-test measurement. Furthermore, very few researchers in the present study used multiple resources for data extraction. To map student learning effects more extensively, researchers would benefit from extracting data from various resources, including field observations, student reflection comments, learning analytics from LMS, online chats, etc. Skills competency assessments are typically conducted through performance assessments, project-based assessments, product assessments, and portfolio assessments (Yustitia & Wardani, 2017).

## **Practical implications and policy considerations**

Implementing authentic assessment in universities can be daunting due to the reluctance and inflexibility of tutors to change from traditional assessment forms, such as written closed-book tests and oral examinations. While recent literature underscores the value of authentic assessment, embedding its practical aspects and characteristics into national curricula can nurture students' capacity to apply new knowledge in real-world contexts, equipping them with essential 21st-century skills for employability.

The Quality Assurance Agency (QAA, 2017) endorses authentic assessment as a strategy to address cheating and assure academic integrity. To support students' understanding and knowledge achievement, promote satisfaction, and enhance engagement, well-developed, realistic, and challenging authentic assessments should be reframed and incorporated, as suggested by recent literature. Students should be prepared to face new assessment demands, empowered with clear instructions, scaffolding, appropriate resources, and emotional support from instructors to tackle new challenges and complex problems. Researchers (Murphy et al., 2017; Barker, 2022) highlight the necessity of encouraging lecturers to introduce authentic assessment methods into their teaching processes by providing clear guidelines.

Kong and Yuen (2022) and Akbari et al. (2022) advocate for detailed instructions, including clarifying the grading system and offering constructive feedback to help students overcome anxiety and uncertainty. University tutors should be professionally developed, trained, and equipped with essential knowledge and skills to design and implement various authentic assessment methods confidently. Sulaiman et al. (2020) recommend improving lecturers' literacy levels regarding authentic assessment methods. Given the trend toward online assessments, promoting the development of tutors' digital skills to design fully online assessments and leverage technology-based multimedia is crucial (Ibrahim, Malik, & Avianti, 2023).

Further research is needed to comprehensively understand the interrelations between authentic assessment and sustainable development in education, aligning with the 17 Sustainable Development Goals (SDGs) of the United Nations 2030 Agenda (UNESCO, 2019). University tutors should receive more training opportunities on assessment design to transition from conventional forms to more authentic strategies consistent with sustainable behaviors and attitudes for future generations.

To achieve higher-order learning outcomes, students need assistance in understanding and defining assessment criteria and quality standards. This can be accomplished by designing proper curricula and valuable rubrics with feedback guidelines. The culture in assessment processes should shift from traditional scoring to authentic assessment, which aligns with labor market demands and is central to students' professional welfare. The rise of conversational AI language models (e.g., ChatGPT, Google Bard) raises concerns about academic integrity, suggesting the need to embed AI programs in authentic assessments to prepare graduate students for their use in industries (Montano et al., 2023).

Prompt and constructive feedback interventions should be provided to prepare students for learning through feedback, avoiding misinterpretations, and fostering self-confidence and responsibility. Multiple opportunities for dialogues and reflective experiences enhance peer assessment and feedback skills, and digital technology can support peer interaction and group work through gamified mechanisms (Wood et al., 2013). The European Association for Quality Assurance in Higher Education outlines standards for quality assurance of e-learning courses, emphasizing student assessment, certification, and electronic security measures (Huertas et al., 2018).

To minimize academic misconduct, institutions should design time-restricted authentic assessments requiring the application of theoretical and practical skills, promote ethical values, and use plagiarism detection tools (e.g., Turnitin, Cadmus) (Adama et al., 2023).

Higher education institutions must assess the quality standards of assessment methods, closely related to evolving quality assurance. Stakeholders within universities should review assessment and feedback policies to ensure they meet quality components. These features should align with student satisfaction, real-world claims, and 21st-century skills. Collaboration with external stakeholders, such as employers and professional organizations, is essential to revise and reform authentic assessment methods.

Aligning assessments with course or program learning outcomes and objectives ensures that authentic assessments accurately measure knowledge achievement and competencies (Al-Ghazo, 2023).

Communication with employers and industry supervisors is vital for designing assessments that increase authenticity. Interaction with fellow faculty members working on authentic assessments is also crucial.

Students should be familiarized with digital equipment needed for authentic assessment tasks, and institutions should provide flexible solutions that include digital and blended elements. Systematic radical transformations should be adopted in the national curriculum to meet accreditation and quality standards, encouraging a quality culture of participation and shared responsibility (Lucander & Christersson, 2020).

Clear and transparent policies and procedures should guide the implementation of authentic assessments, including guidelines on assessment design and feedback protocols. By implementing these strategies, higher education institutions can effectively integrate appropriate assessments into educational practices, promoting meaningful learning experiences for graduate students.

## 7. Conclusions

After thoroughly reviewing a vast amount of literature, we conclude that the Achilles' heel of education is finding powerful assessment mechanisms relevant to real-world situations and professional life. In recent years, there has been a cultural shift from summative assessment methods—such as written assignments, standardized tests, examinations, and pen-and-paper exercises—towards assessment for learning. This includes more innovative and holistic approaches in higher education, calling for a harmonious pairing between traditional and modern assessment methods. Authentic assessment has gained significant attention from scholars, researchers, and practitioners.

This article contributes to the debate on authentic assessment by providing a historical perspective to clarify the concept. As researchers delve into this field, new aspects and challenges emerge for theorists, teaching staff, practitioners, and institutional authorities. The paradox between authentic assessment in real-world situations and societal transformation, as advocated in numerous papers, should converge into a more inclusive definition of authentic assessment.

Based on the literature, some best practices for designing and incorporating authentic assessments in higher education include:

1. **Determine Learning Outcomes:** Design assessments aligned with learning objectives to ensure they accurately measure the knowledge and competencies students are expected to acquire.
2. **Design Meaningful Assessments:** Create assessments that are meaningful to students, have value beyond merely the score achieved, and mirror real-world tasks students may encounter in their academic pursuits or future workplaces.
3. **Incorporate Multiple Assessment Methods:** Use various assessment methods to provide a comprehensive evaluation of students' performance.
4. **Provide Clear Instructions:** Offer clear instructions about the assessment tasks, including their purpose, criteria, rubrics, and expected learning outcomes to enable fair and consistent evaluation.
5. **Constructive and Timely Feedback:** Provide feedback that guides students' learning and improvement.
6. **Reflect on Assessments:** After completion, reflect on the assessment to identify areas for improvement, make necessary changes for future use, and ensure continuous enhancement of the assessment process.

This systematic review provides insights into authentic and online authentic assessments in universities, focusing on enhancing employability and developing 21st-century skills, which are often treated separately. Practical and policy implications for university academics and educational institutions have been outlined to develop work-ready graduates. Emphasis is given to students becoming protagonists of the learning and assessment process and acting as collaborators in shaping their learning experience.

Despite the progress, a dilemma identified in the literature remains: what matters more, the quantity or quality of assessment methods? This question requires further investigation in future studies. This ongoing debate highlights the need for continuous research and adaptation in the implementation of authentic assessments to ensure they meet educational goals and prepare students for professional success.



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