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Using new assessment tools during and post-COVID-19

Gbolahan Olasina
golasina@gmail.com

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Abstract

This work tackles the need to evaluate and identify fresh assessment techniques utilized in LIS education during and after the COVID-19 epidemic. It investigates the impact of digital media, feedback, formative assessments, and concerns such as cheating and authenticity, providing critical insights for future assessment practises in the post-pandemic period. Accordingly, there is a pressing need to employ new assessment tools post-pandemic to adapt to online and hybrid learning challenges. This qualitative study investigates complex social phenomena in higher education assessments by exploring behaviours, preferences, beliefs, customs, attitudes, viewpoints, and experiences. Twelve LIS instructors, 6 teaching and learning administrators, and 20 LIS students from South Africa and Nigeria were chosen using convenience sampling. Key informant interviews were conducted, with constructivist learning orientation-driven questions examining new assessment technologies, the role of digital media in student assessment, authenticity concerns in e-assessment, feedback and formative assessments. The research concludes that incorporating Computer-Based Learning (CLT) in e-assessments for LIS education enhances students' knowledge construction and accessibility. Digital examinations offer benefits like instant feedback and personalized learning experiences, leading to improved problem-solving skills and decision-making. Future research should focus on larger, diverse samples and longitudinal approaches to evaluate intervention effectiveness and sustainability.

Keywords: traditional assessment, e-assessment, higher education, teaching and learning, South Africa.

1. Introduction

The onslaught of COVID-19 brought many changes in all spheres of our lives, such as personal hygiene, social interactions and everyday living, healthcare, mental well-being and work-life balance, and education, to name a few. To this day, we are still measuring the impact of COVID-19 on student learning outcomes. It is known that many institutions already adopted and used online assessment tools, but these were exacerbated during and post-pandemic, and the purpose of this paper is to identify and evaluate these novel assessment tools. For example, in the health sector, new assessment techniques emerged to assess the impact of the virus on the health and well-being of people, given the long-term consequences of the virus and associated vaccines and interventions. The COVID-19 symptom assessment tool (C-SAT), the psychological impact scale (CPIS), and patient-reported instruments were some of the tools constructed to examine the impact of the virus on physical and emotional health and the psychological effects on people's mental health and their lived experiences (Tran *et al.* 2022). The pandemic sped up digital transformation in higher education, with many faculty members realigning their curriculum, syllabi and student assessment tools to online platforms and digital pedagogy. With the post-pandemic period, students, programmes, faculty, university and teaching and learning administrators and managers face the challenge of the best approach towards online teaching, learning and assessments with the return of in-person classes and associated traditional assessments. Library and Information Science is not immune to this critical debate. The LIS field, like others, was forced to adapt to the new digital assessment landscape. Accordingly, this research aims to determine the benefits and drawbacks of utilising new evaluation tools in LIS education after COVID-19. The study helps evaluate the value of innovative assessment methods and their potential in LIS education.

Kurtz, Lloyd, Harwin, Chen, and Furuya (2021) present the findings of a study conducted by EdWeek Research Centre where K-12 district leaders reported that assessing student learning is a fundamental priority. The respondents also indicated increased use of online formative assessments during the pandemic. It demonstrates that teachers now embrace the new normal and edge towards a more formative, continuous and innovative assessment model. Pophiwa, Deliwe, Mathe, and Taylor (2020) report that the Department of Basic Education in South Africa reveals a shift towards using formative assessment during COVID-19. Chirinda, Ndlovu, and Spangenberg (2021), in a study published in the South African Journal of Education, found that online assessment tools effectively evaluated students' understanding of mathematics during the pandemic. The report highlights that digital assessment tools provide real-time feedback to students and learners and support ongoing learning during the pandemic. The current research evaluates the effectiveness of feedback and formative assessments in new e-assessment methods for LIS education in the post-pandemic future. This research provides insights into the future of assessment practices in LIS education by examining the role of feedback and assessments in e-assessment tools. Consequently, this study aims to examine the role of digital media in student assessment in LIS education. Digital media offers affordances for interactive and participatory evaluation approaches and innovative opportunities to facilitate authentic assessment tasks, stimulate real-life scenarios and capture students' abilities and skills (Godsk 2020; Marín, Carpenter, Tur, and Williamson-Leadley 2022). Understanding the role of digital media in student assessment can help educators to improve their assessment practice, ensure that students acquire the required skills and enhance student engagement.

Nevertheless, many teachers and staff struggled with traditional assessment techniques during the pandemic (Kamal, Abo Omirah, Hussein, and Saeed 2021). Kosimov (2022) signposts how fundamental it is to use new evaluation techniques during and after the pandemic. The author shares faculty experiences with assignments and in-person assessments, which may be inappropriate for new distant learning of the future. Pais and Hall (2021) report faculty experiences using online formative assessment tools, such as Google Forms, Quizlet and Kahoot, with evidence of improved student engagement and provision of quick feedback on learning progress. The experiences with online assessment tools resulted in educators modifying their instruction for targeted assistance.

García-Alberti, Suárez, Chiyón, and Mosquera Feijoo (2021) narrate the experiences of students who could not focus using online exams. Many authors reported the difficulty experienced by lecturers who used more hours grading online assessments during the emergency transition to online teaching, learning and assessments (Lemay, Bazelais, and Doleck 2021; Clark, Callam, Paul, Stoltzfus, and Turner 2020). Joshi, Vinay, and Bhaskar (2021) report technical issues affecting online assessments, such as software and technical glitches, device malfunctions and internet connectivity. There are reports of exacerbation in the rates of cheating, authenticity issues, using unathorised resources, getting help from others or AI-generated content, such as ChatGPT and Bard (Cotton, Cotton, and Shipway 2023). Additional areas of concern include equitable and reliable access to the internet and devices, vulnerabilities to hacking exam questions and answers, security and integrity breaches, lack of personal interaction between students and educators and adaptability to student and instructor needs (Comas-Forgas, Lancaster, Calvo-Sastre, and Sureda-Negre 2021; Selwyn, O'Neill, Smith, Andrejevic, and Gu 2023). While the approach offers affordances, such as flexibility and enhanced efficiency, e-assessments raise fundamental concerns about authenticity in student assessment. Consequently, it examines some of the challenges of e-assessment, such as cheating, plagiarism and cut and paste using AI-generated content, to contribute to the

ongoing discussion about the validity and authenticity of student assessments in the post-pandemic era. Cameron-Standerford *et al.* (2020) capture how some faculty feel rigour is a fine line between challenging and frustrating a student and how online assessment is characterised by its difficulty level, level of interest, perceived relevance to future goals, increased workloads and grading-related standards. The earlier-mentioned authors highlight the influence of the emotional reactions of faculty members to the chaotic emergency online teaching and learning to grasp how to incorporate compassionate yet rigorous modules.

COVID-19 teaching and learning continue to inform our approach post-pandemic. Bashir, Bashir, Rana, Lambert, and Vernallis (2021) suggest that with the resumption of in-person classes, faculty continued using online evaluation tools to augment traditional examinations. The approach enabled meeting the learning needs of students while aiding the transition from COVID-19 teaching and learning to in-person classes easier. The experiences suggest that new assessment methods are critical in response to changes in our learning environments, changing how faculty understand student learning progress.

In other words, the research analyses the using new tools in student assessment in higher education. The traditional assessment faced challenges before the pandemic but faced more hurdles, such as keeping social and physical distance and conducting in-person tests and examinations. Online assessments gained popularity and deployment during the pandemic. Post-COVID-19 has seen a critical debate between returning to traditional assessment and augmenting the traditional with online assessment while others call for exclusively online assessment tools and techniques. Assessing students in LIS education has been a topic of critical debate (Raju 2021; Colón-Aguirre, and Cooke 2022). The study aims to explore the discourse more comprehensively while analysing different perspectives on student assessment post-pandemic. The purpose is to identify the fundamental arguments and counterarguments related to post-pandemic assessment methods while evaluating each approach's merits and limitations.

Equally, online assessment is challenged by restrictions of internet proctoring, authenticity, designing pedagogically sound online assessments and AI-generated content. The impact of ChatGPT and Bard continues to transform educational assessments. Chaudhry, Sarwary, El Refae, and Chabchoub (2023) examine the application of ChatGPT and demonstrate its potential to enhance formative assessment processes because of its affordances for critical thinking, problem-solving and real-world scenarios. Rudolph, Tan, and Tan (2023) explore Google Bard for examination issues, such as defined evaluation standards, effective feedback and automatic grading. Despite the affordances of large language models, many challenges and concerns require scholarly analysis. For example, Rudolph, Tan, and Tan (2023) raise concerns about domain-specific knowledge, dependability and validity of AI-generated content in evaluating complicated cognitive competencies as fundamental considerations, just as data privacy, prejudice in AI algorithms and ethical issues. The research aims to explore the crucial questions about the contentious issue and showcase the traditional and online assessment techniques. The overriding research objective is critically analysing and comparing traditional and online assessment techniques in Library and Information Science (LIS) education.

1.2 Research objectives

The specific research objectives are to

1. Identify the advantages and disadvantages of using new assessment tools post-COVID-19 in LIS education.
2. Examine the role of digital media in student assessment.
3. Explore authenticity issues in student e-assessment in LIS education.
4. Critically analyse the debates on student assessment in LIS education.
5. Explore and gain insights into the dimensions and experiences associated with feedback and formative assessments in new assessment tools for LIS education in the post-pandemic future.

2. Constructivist learning theory (CLT)

Dewey *et al.* (1997) state that the constructivist learning theory (CLT) prioritises active learners constructing their knowledge and meaning based on their experiences. It assumes that the learning climate, such as the socio-cultural, drives learner engagement as a foundation for prior and new knowledge and experiences. Chuang (2021) describes adult learners as actively engaged in learning and led to construct their knowledge and excel in retention and understanding in the environment of life-wide learning. Ozkara and Cakir (2020) underpin their investigation of the effectiveness of a learning management system with the CLT. The authors found a positive effect on the learning of the students. The researchers report the appropriateness of the theory for online learning contexts. Equally, Magnuson (2013) used a constructivist lens to explore teaching information literacy (IL) skills to undergraduate students finding that the approach resulted in significant improvements in the IL skills of the students, such as location, evaluation and use of information abilities. Fernando and Marikar (2017) try to understand the military and civilian students' response to constructivist learning theory (CLT) and participatory teaching techniques and their concepts and knowledge in the context of online learning. The authors report that learning is an active experience, students' views are formed as part of their learning experience, and that learning is socio-culturally founded. The strengths of the CLT include its focus on personalised and active learning, holistic approach, practical application to face-to-face, hybrid, traditional and online learning settings and support for collaboration. Nevertheless, it has weaknesses, such as unsuitability for all learners, difficulty creating a balance between social and individual learning and its complexity of execution in conventional settings (Alanazi 2016). Despite the weaknesses of the CLT, it is solely used to underpin the current research because it meets the needs of the study. At the same time, the drawbacks are addressed by the researcher being aware of their own biases and how they influence the study. The researcher is open about personal perspectives and prejudices in ways to reduce their effect on the fundamental results of the research (Liu, and Matthews 2005). Similar procedures to minimising the weaknesses of the CLT in this study included using a diverse sample of LIS experts from various experiences and backgrounds to reduce the possible limitations of the CLT in line with Eyisi (2016). The approach ensures that CLT underpins the study of assessment in LIS education, considering assessment methods and procedures support the construction of knowledge by students. Accordingly, the CLT help position the researcher as a critical realist who actively co-constructs meanings with respondents, acknowledges meanings as fluid and recognises respondents' accounts of accounts reflecting the subjection stories of their experiences.

3. Methods

A qualitative research design is adopted because the research focuses on complex social phenomena requiring exploring behaviours, preferences, beliefs, customs, attitudes, perspectives and experiences. The choice of a qualitative design is based on informing and refining existing theories in the landscape of assessments in higher education, as the focus areas include identifying themes and patterns (Islam, and Aldaihani 2022). The participants are LIS educators, teaching and learning administrators and LIS students drawn from diverse experiences and socio-cultural backgrounds. The research sites are selected LIS schools in South Africa and LIS schools in Nigeria using convenience sampling. The sample sizes of 12 LIS educators, 6 teaching and learning administrators and 20 LIS students are adopted. The student respondents include postgraduate and undergraduate levels. Eight LIS educators were selected at LIS schools in Nigeria; otherwise, the selection was distributed evenly between the two research sites. Many research methodologists suggest appropriate sample sizes for qualitative studies. For example, Miles and Huberman (1994) argue that 10-15 individuals from a homogeneous cohort may be sufficient for qualitative research. Creswell (2014) justifies the appropriateness of a sample size of 5-25 people for qualitative research. Gill (2020) describes the goal of qualitative sampling as recruiting enough respondents to provide rich data to understand phenomena. The sample size should be sufficient to generate quality data providing a rich understanding of an experience in line with the needs of the study. In other words, the selection of the sample sizes is framed by the guidelines for determining sample sizes in qualitative research. A rigorous purpose sampling technique is adopted to select experts who are LIS educators, students and teaching and learning administrators. Rigour is demonstrated by carefully considering the population, sampling frame, sampling sizes and the sampling scheme to ensure representativeness and limit bias (Landreneau 2009). The criteria allow for expertise in LIS education and systematic processes to include diverse experiences and perspectives, including more experienced and newly registered students, to ensure a transparent selection process. Participant recruitment employs contacting the experts and administrators through appropriate channels, such as emails and formal communication platforms.

The data collection method is in-depth interviews with expert LIS educators, teaching and learning administrators and students. The interview instrumentation is constructivist learning orientation driven, stressing social interaction, knowledge building and learner participation. The interview schedule design involves delicately capturing respondents' experiences and opinions on the focus of the study. The open-ended questions illuminate the affordances, advantages and disadvantages of new assessment tools, the role of digital media in student assessment, concerns about authenticity in e-assessment domains and debates and controversies about student assessment in LIS education and gaining insights of feedback and formative assessments. The reasoning is based on the distinct strengths and advantages of interviews as a data-gathering tool, particularly in capturing participants' viewpoints and experiences richly and nuancedly. Several studies, such as Akimov, and Malin (2020), Ismail, Khelifi and Harous (2022), Lynch, Sage, Hitchcock and Sage (2021), inform the design of the interview schedule.

A total of 12 LIS educators consented and participated. All the faculty members are full-time with PhDs in Library and Information Science, Information Studies and Information Science. Accordingly, the experts have adequate qualifications and a record of active participation in LIS-related debates, workshops, conferences, and engagement with varied perspectives and exchanging ideas. The lecturers demonstrate the ability to acknowledge and critically evaluate opposing views, ideas and approaches in the LIS field. This is evidenced by their research publications and public engagements in their keynote addresses, invited seminars and industry-related events, such as LIS professional bodies and academic societies. The lecturers

demonstrate incorporating innovative teaching practices, such as revision of course templates and adjusting their teaching methods in line with the needs of the students and industry. For instance, during the COVID-19 pandemic, they demonstrate a range of responses to integrating digital and online teaching and learning modes. The lecturers demonstrate in their teaching portfolio a proven record of integrating diverse student cultures and perspectives in teaching content and using inclusive classroom techniques. Their teaching experiences range between 10 and 35 years, 7 (58%) are women, and 5 (42%) are men per gender balance. The 6 teaching and learning administrators have first, second and advanced degrees (PhD) depending on their roles. Some roles include serving as the sub-Dean, LIS examinations officer, LIS teaching and learning coordinator, programme assistant, LIS teaching technologist, and LIS computer laboratory support staff. The teaching and learning administrators have experience ranging between 5 and 20 years. They are 3 females and 3 males. A total of 20 registered students in the LIS/Information Studies programme participated in the study. Student enrolment involved those from various ethnicities, races, age groups, backgrounds and various perspectives and experiences during online emergency assessments during and post-pandemic. The students comprise undergraduate (16) and postgraduate (4) students. A larger sample size of undergraduate students is expected to provide rich data on how e-assessment tools are perceived and experienced by students who are relatively new to LIS training. The postgraduate students are included to shed more light on and understand LIS education with traditional and digital assessments (Webber-Ritchey *et al.* 2021).

The current researcher recognises potential personal biases and their impact on the entire research process. Continuous self-reflection is used to detect and acknowledge my personal biases, prior beliefs in technology adoption and use and assumptions about assessment tools in LIS education. The approach to self-awareness enabled the researcher to identify potential influence on the research process and results. The researcher holds second and advanced degrees in LIS with exposure to diverse assessment approaches in different contexts with a strong resolve to investigate the nexus between digital tools and educational assessment. The researcher has practical experience working as a systems librarian in a university, where I directly observed the emergence of online quizzes. The researcher has been an educator in LIS schools across Africa, specialising in Information Systems for over seventeen years. I observed the introduction of new technologies, digital and online tools to university libraries and LIS schools in the early 2000s and the quick and emergency transition to digital assessments during the COVID-19 pandemic. These experiences allowed me to follow the obstacles and opportunities of applying new assessment tools in LIS education. The researcher has participated in continuous professional development, attending conferences, workshops and seminars on assessment procedures, EdTech, and the impact of the pandemic on education, and these encounters impact the researcher's ideas and deepen the understanding of these issues. The adopted reflexivity strategy retained throughout the research process is expected to reduce the impact of the researcher's personal biases. The researcher outlines background information and experiences for readers to evaluate how the researcher's position may inform the study design, data interpretation and analytic conclusions. Consistency and rigour in the analysis are ensured using two coders based on a code framework to improve reliability. Each coder analyses the interview data independently to identify formulated meanings and emerging themes, reduce biases, and compare and discuss different opinions to boost the validity of the conclusions. The adopted coding rules contribute to transparency by allowing others to follow and imitate the coding process. Overall, regular conversations and meetings bring the coders together to make coding decisions, align interpretations and resolve conflicts to reach a consensus and share knowledge of data on significant themes.

After confirming participation, interview sessions are conducted based on mutually convenient schedules, and participants are provided resources for data-gathering. The research adhered to ethical criteria, such as approval from requisite institutional review boards, data protection, privacy standards, informed consent (including permission to record the interviews) and providing information on the rights of participants. The research ethics protocol involved informing the respondents about their rights to withdraw from the research at any point and pursuit of anonymity, confidentiality and good ethical practice.

4. Data analysis

Interview transcription and recording increased the accuracy of the participants' responses by allowing a thorough examination of interview data. Detailed notes are taken during the sessions to capture contextual information and non-verbal cues. As a result of the focus of the study, the researcher conducted the interviews to have a deep understanding of the respondents' experiences, anecdotes, perspectives, emotions and feelings. The researcher's direct connection with the respondents enhances probing, obtaining nuances and clarifying questions (Solarino, and Aguinis, 2021). Equally, given the controversial nature of some of the themes, respondents may be more at ease discussing the opinions since the researcher has built rapport and trust with some of them over the years. While thematic analysis has many pathways, some authors provide frameworks. Consequently, the adopted thematic analysis procedure involves uncovering patterns, themes and fundamental findings in the interview data in line with Braun, and Clarke (2023; 2022). The procedure consists of transcribing the recorded interview sessions, driven by familiarisation by reading and re-reading the transcripts. Initial coding is done to identify and categorise ideas, opinions and experiences relating to the critical questions of the study. After that, a codebook approach is created to enhance consistency and a systematic method (Finlay, 2021). The next phase is determining the themes by grouping relationships, commonalities and codes. The identified themes will now be revised and refined for compatibility, relevance and coherence with the study's critical questions, prioritising themes conveying the data's complexity and nuances. Data exploration and interpretation investigates themes concerning the purpose of the study through an understanding of the benefits, drawbacks, role of digital media, debates, authenticity issues, and the effectiveness of feedback and formative assessments in post-pandemic LIS education. The final phase synthesises and creates a more extensive report by transforming the analytic narrative into a comprehensive picture incorporating a rich and nuanced interpretation of data. The approach enables a methodical and target-oriented presentation, illuminating how each research objective is met and shedding new insights based on interview data (Salamzadeh, 2020). Throughout the research process, the researcher kept a reflexive notebook to record my ideas, reflections, and any biases. The journal acts as a self-analysis tool, critically evaluating the researcher's participation in data gathering, processing, and interpretation (Ortlipp, 2008). Finally, peer reviewing with colleagues, other researchers and experts are conducted based on the findings, interpretations, and potential biases (Keddem, Barg, and Frasso, 2021). Seeking feedback and viewpoints from others assist in challenging the researcher's preconceptions and providing a more balanced and impartial picture of the research. The next section frames the outcomes based on each research objective.

4.1 Identify the advantages and disadvantages of using new assessment tools post-COVID-19 in LIS education.

The study explores the experiences and perspectives of faculty, students and teaching and learning administrators to help our understanding of the effects of e-assessment tools and associated practices, the affordances, challenges and limitations. The analysis is in the domain of LIS education and outlines creative, imaginative, current and futuristic ways to measure academic performance and give student feedback. Some significant statements are presented next. A faculty member sees e-assessments as "*offering a broader range of options for assessing student learning outcomes and engagement during remote learning."* A teaching and learning administrator emphasises "*one advantage of digital assessment tools as the ability to give instant feedback helping students to monitor their progress to close any gaps."* Some of the insights into the identified advantages and disadvantages are nuanced. For instance, the experiences are framed by carefully considering the affordances and drawbacks. A lecturer states that *"the affordances of photographs, videos, interactive simulations, AR, VR and other hypermedia components enhance teaching and learning experiences and frame an improved understanding of complicated concepts in cataloguing, classification and knowledge organisation are critical advantages of digital assessment tools and methods in LIS."* One teaching and learning (TandL) administrator says *"e-assessments allow for incorporation of real world data and real life scenarios affording students to apply theory from class to hands-on application and helping to develop problem-solving abilities to problems in the field."* Some of the experiences of students in this regard are illuminated here. " *Online discussion forums and collaborative platforms create a sense of community and enhance peer-to-peer learning in LIS, enhancing engagement and information exchange between students and lecturers and among students.* " *As one student highlights "a benefit of using e-assessment tools in LIS is the ability to collaborate and connect worldwide by participating in joint projects and participation in discussions outside cultural confines, geography given the flexibility of online teaching and learning."* The formulated meanings for the aforementioned significant responses show respondents see advantages when multimedia components are incorporated into digital examinations promoting complications in learning cataloguing, classification and knowledge organisation. Respondents describe the strengths of digital assessments promoting applying theory to real-world scenarios, fostering problem-solving skills and developing hands-on in LIS. Respondents describe online assessment as a platform for building a feeling of community and facilitating peer-to-peer learning, connections and exchanges. The emerging themes from the formulated meanings above are Improving Understanding of Multimedia Integration, Bringing Theory and Practice Together in Real-life Contexts, and Promoting Community and Connections Through Online Learning.

Some counterarguments, disadvantages and considerations in the statements and responses are presented next. A respondent emphasised a fundamental disadvantage of e-assessment in Library and Information Science (LIS): the lack of face-to-face connection and its impact on engagement, morale, understanding, and interpersonal interactions in traditional classroom settings. For example, a lecturer shares that "*a significant disadvantage of e-assessment in LIS is the loss of face-to-face interaction and the lost opportunity for nuanced engagements in conventional classroom environments, ultimately affecting the morale and the depth of understanding and interpersonal interactions."* Heavy reliance on e-assessments can create a technological hurdle, thereby worsening inequalities and marginalisation of black and economically disadvantaged students with a lack of digital skills and limited access to technology resulting in poor academic outcomes. In this light, a TandL administrator says *"reliance on digital assessments may lead to a technological barrier, exacerbate inequities, marginalisation and exclusion for economically and digitally disadvantaged students with either limited access to technology or lack of digital skills resulting in poor academic outcomes."* Despite their convenience and flexibility, there are fears of a shift in focus with e-

assessment. A student outlines "*that while digital examinations may be flexible and convenient, I see a problem of surface-only learning with students focusing on meeting assessment criteria instead of deeply engaging with the study focus area and critically reflecting on their learning experiences.*" Many institutions were using LMS and online quizzes and assessments before COVID-19 but the pandemic hurried up the diffusion of digital assessments. A lecturer in the context of drawbacks states, "*the e-assessments may limit the types of tasks and assessments that can be conducted, particularly in disciplines, such as LIS that require hands-on practical skills, potentially overlooking important aspects of learning and evaluation.*" However, participants raised certain concerns, such as the possibility of growing reliance on technology, privacy problems, and the necessity to maintain the legitimacy of assessments. For example, a TandL administrator is learning "*the authenticity of assessments can be compromised in online environments, as there is an increased risk of plagiarism and the temptation to rely on online resources without proper citation and acknowledgement, raising concerns about dumbing down academic integrity.*" Despite the enthusiasm, some students expressed concerns about the increased reliance on technology, which may pose challenges for those with limited access to devices or stable internet connections." For instance, a student respondent says, "*as students are frequently required to navigate unfamiliar and uncharted online terrains, adapt to new assessment formats, and manage technical issues that can impact their performance and overall experience, e-assessments introduce additional stress and anxiety.*"

Based on the formulated meanings, online assessments require targeted interventions and careful planning on the nuanced insights provided by the respondents. For instance, the formulated meanings from the significant statements highlight respondents who experience a lack of face-to-face connection with e-assessment and suffer damaging and hurting morale and drawbacks of the depth of comprehension and interpersonal relationships. Respondents outline a heavy dependence on e-assessments that exacerbates disparities and isolate economically disadvantaged students with inadequate digital skills, technological access, and low academic achievement. A respondent is worried about a shift in focus since some students may over-indulge in meeting digital assessment criteria over critical and meaningful engagement in their learning. A respondent explains how e-assessments may limit tasks that can be performed, thereby omitting key parts of learning and evaluation in LIS and other fields requiring practical skills. Another respondents show concerns about the legitimacy of online examinations, such as increased plagiarism risk, reliance on online materials without sufficient reference, and potential challenges to academic integrity. Finally, the formulated meaning from a respondent discusses students who do not have access to devices or consistent internet connections who may face difficulties, raising tension, anxiety, and technical concerns that affect their performance and overall experience with e-assessments.

Some key themes drawn from the formulated meanings include e-assessment tools' expanded assessment possibilities, quick feedback, improved teaching and learning experiences, real-world application, community building, peer learning, and bridging theory and practice. Also, the formulated meanings reveal the downsides of utilising new assessment tools in LIS education, such as the loss of face-to-face interaction, technological barriers, inequalities and inequities, a shift in focus and surface-level learning, limitations in task variety and practical skills evaluation, and difficulties in maintaining authenticity and academic integrity. The analysis emphasises the need for careful consideration and tailored approaches when implementing digital assessments in specific domains. The in-depth analysis demonstrates diverse perspectives of LIS students, lecturers and administrators.

4.2 Examine the role of digital media in student assessment

The study investigates how digital media platforms and technologies are used in the assessment process. Digital media is a fundamental aspect of education, disrupting teaching and learning and incorporating digital media into student assessment in response to adapting new e-assessment methodologies. The goal is to get a thorough understanding of the role of digital media in student evaluation, which will provide significant insights for stakeholders, such as educators, policymakers, and educational researchers. Understanding the role of digital media in student assessment is vital to deal with inclusivity and equity concerns. It may reveal how various online exams may inform student categories within the context of the digital divide. Relevant extracts are embedded in the paper to provide an analytic narrative with compelling illustrations about the interview data to make arguments and arrive at formulated meanings drawn from cluster themes to cover this objective. Using visual representations, the thematic analysis approach involved organising many codes into prospective themes. After that, themes are examined, improved and validated against the data set and revised as appropriate with defined themes, labels and a logical structure as approved by Braun and Clark (2006). In short, the themes reflect the interview responses' fundamental experiences, perspectives and viewpoints. An in-depth analysis of the interview data stresses the value of social, human, and cultural components in the function of digital media in student evaluation. They highlight the formulated meanings, such as the importance of balancing creativity and cultural knowledge, investigating varied views, cultural expression, human connection and relationships, interdisciplinary learning, and equitable access, and the critical need for balancing creativity and cultural understanding in the context of digital media and assessments. Thus, some of the significant statements, formulated meanings and emerging themes obtained are presented in Table 1.

Table 1: Interview data on the role of digital media in student assessment

Significant statement	Formulated meaning	Emerging theme
"The use of digital media in student assessment has enabled the investigation of a wide range of social, human, and cultural behaviours, preferences, and perspectives." Students can use online platforms to collaborate on projects, allowing them to grasp complicated social processes better." LIS expert L)	Respondent describes using digital media in student evaluation allows for investigating various social, human, and cultural behaviours and viewpoints.	Investigating various Social and Cultural Points of View
"Through multimedia projects, digital media allows LIS students to express their cultural identities and beliefs." It gives students a forum to share their thoughts and connect with the social and human dimensions of many cultural contexts." (TandL administrator 06)	Respondent describes how digital media platforms improve student collaboration and comprehension of complicated social processes.	Multimedia Projects for Cultural Expression
"While digital assessments are convenient, there is concern about the potential loss of human connection and the inability to thoroughly interact with the course material's social and cultural dimensions. Understanding the intricacies and complexities of human behaviour and society conventions	Respondent is concerned about the potential loss of personal connection and the limited contact with social and cultural components in digital assessments, which could influence overall	Human Connection and Understanding in Digital Assessment

requires personal engagement." (Student A)	engagement and understanding.	
"In my experience, digital media in student assessment has provided a platform for authentic and collaborative learning experiences." It helps students to connect with practical social concerns and apply theoretical principles to real-life circumstances, strengthening critical thinking and problem-solving abilities." (LIS expert X)	Respondent describes that using digital media in student assessment promotes realistic and collaborative learning experiences by connecting theoretical ideas to real-world situations and enhancing critical thinking.	Learning Experiences that are both Authentic and Collaborative
"Incorporating digital media in student assessment has allowed students to participate in collaborative projects, such as group discussions, shared document editing, and virtual presentations." This collaborative approach improves cooperation skills and helps students to investigate complicated social problems as a group." (LIS expert C)	Respondent describes using digital media in student evaluation encourages collaborative projects, improves cooperation skills, and allows for exploring complex societal problems.	Online Learning Platforms and Collaborative Learning
"I have observed that incorporating digital media in student assessment has sparked creativity and self-expression among students in the Faculty. They have effectively communicated their ideas through multimedia presentations, digital storytelling, and online exhibitions, improving their communication and presenting skills." (TandL 01)	Respondent shares how digital media assessments encourage students' creativity and self-expression while improving communication and presentation abilities.	Improved Communication and Expression
"While digital media offers flexibility and convenience, I believe there is a risk of overlooking the human assessment strands. Personal engagement with instructors and classmates, essential for intellectual growth and emotional support, may be jeopardised in digital evaluation, resulting in students feeling detached and isolated." (Student 15)	Respondent shares a risk that digital evaluations would ignore the human side of assessment, potentially leaving students feeling distant and lonely.	Digital Assessment-led Detachment and Isolation
"Digital media assessments promote interdisciplinary learning by allowing students to investigate the social, human, and cultural components that intersect in LIS." It encourages students to examine society's challenges from various angles critically." (LIS expert K)	Respondent describes how LIS digital media assessments promote transdisciplinary learning and critically examine societal issues in the industry.	Exploration of Social and Human Components from a Multidisciplinary Perspective
"The use of digital media in student evaluation has increased opportunities for interdisciplinary learning in LIS and broadly in the social sciences and	Respondent describes how using digital media in student evaluation broadens chances for	Opportunities for Interdisciplinary Learning

humanities." Students can investigate many points of view, gain access to enormous digital archives, and engage in multimedia analysis to better understand complex social and cultural issues." (LIS expert B)	interdisciplinary learning and provides access to extensive digital archives for studying complicated social and cultural concerns.	
"Equitable access to digital assessments is critical to ensuring that students from various social, cultural, and economic backgrounds have equal opportunities to participate in and contribute to assessments." It is critical to address technological impediments and assist underrepresented and marginalised students." (TandL administrator 05)	Respondent expresses that ensuring fair access to digital assessments is critical to overcoming technological barriers and empowering students from varied backgrounds.	Equity in Accessing Social and Cultural Learning Opportunities
"While digital media has increased assessment opportunities, we must ensure that technological barriers do not impede equitable access to assessment opportunities." Addressing digital divide issues and supporting economically disadvantaged and marginalised students to participate in digital assessments fully is critical." (TandL administrator 04)	Respondent explains that technological hurdles must not prevent students from having equal access to assessment opportunities, demanding measures to bridge the digital divide and support underprivileged and underrepresented students.	Identifying and Addressing Technological Barriers and Equity
"During assessments, digital media has allowed me to demonstrate my creativity and critical thinking skills in new ways." However, I have found that the pressure to make visually appealing digital presentations or projects can sometimes eclipse the depth of my comprehension of the issue." (Student 20)	Respondent explains how digital media allows unique ways to exhibit creativity and critical thinking skills and how during examinations, the emphasis on visually appealing digital presentations or projects can sometimes overwhelm the depth of understanding of the problem.	Balancing Creativity with Depth of Knowledge

4.3 Explore authenticity issues in student e-assessment in LIS education

The interview analysis on authenticity difficulties in student e-assessment in LIS education provides a variety of responses from postgraduate and undergraduate students, TandL administrators, and expert LIS professionals. These results illuminate the intricacies of digital assessments, the difficulty of ensuring authenticity, and novel techniques for increasing how stakeholders accept, use and sustain digital assessments in a post-COVID-19 environment. The statements unravel the real-world views of students, TandL administrators, and expert LIS lecturers from African universities. The formulated meanings outline authenticity challenges in student e-assessment, pre- and post-COVID-19 considerations, and assessment techniques and predictions for the future. The formulated meanings of the student responses demonstrate the complex human nature considerations concerning authenticity difficulties. The central

themes are cooperation and peer learning, socio-cultural contexts, relevance and personal interaction. The results frame human, behavioural and attitudinal elements of student interactions with digital assessments. The interview results offer provocative insights and shed new light on authenticity difficulties in student e-assessment in LIS education.

Relevant significant statements, formulated meanings and related themes are outlined in Table 2.

Table 2: Interview data on authenticity issues in e-assessment in LIS education

Significant statement	Formulated meaning	Emerging theme
"Authentic assessments in LIS education, in my opinion, should go beyond traditional exams/papers and augmented e-assessments in South African higher education." We must combine real-world projects, internships, and industry collaborations to educate students for their future jobs. This strategy ensures that assessments represent our future professional problems." (LIS expert A)	Respondent explains that authentic assessments in LIS education should go beyond standard exams/papers and augmented e-assessments but include real-world projects, internships, and industry collaborations to better prepare students for future professional problems.	Authenticity beyond Current Approaches to Evaluations Application in the Real World and Career Preparation
"I'm conflicted about digital assessments." On the one hand, they seem to provide convenience and flexibility, particularly in the COVID-19 era. However, I sometimes doubt the validity of online assessments compared to in-person/physical evaluations. It is easier to cheat or rely on outside resources without being caught, compromising the credibility of the assessment process." (Student 7)	Respondent is concerned about issues regarding their validity when compared to in-person evaluations, as cheating and reliance on external resources may jeopardise the assessment process's credibility.	Authenticity versus Convenience Academic Integrity and Honesty
"As we move toward more online assessments, it is critical that we address accessibility concerns." Not all students have reliable and stable internet connection or access to appropriate devices. We must make alternative plans to accommodate all students with varying requirements so no one lags behind." (TandL administrator 02)	Responded is worried that not all students have dependable internet connection or adequate equipment, the change to online examinations demands addressing accessibility challenges to meet varying needs and promote equal participation.	Digital Divide and Inequities in Access Practices of Inclusive Assessment
"The COVID-19 pandemic made us reconsider our risk assessment strategies in my LIS school in Nigeria." While there are barriers, such as maintaining academic integrity online, it has exposed a window to new assessment methodologies. We may use technology to develop	The COVID-19 pandemic triggered a rethinking of risk assessment procedures at a LIS school, showing the potential for interactive multimedia	COVID-19-driven Adaptation and Innovation Using Technology to

interactive multimedia tasks that promote critical thinking, creativity, communication and interpersonal skills, technology proficiency and project management skills going forward." (LIS expert F)	projects that encourage critical thinking, creativity, and communication skills.	Create Engaging Assessments post-COVID-19
"I see e-portfolios playing a significant role in future assessment methods." LIS students can collect their work, such as research and digital library projects, reflections, and multimedia presentations, to demonstrate their skills and growth as they progress through their academic journey and search for jobs. This provides a dynamic and interactive way to showcase their talents."* (LIS expert D)	Respondent predicts the role E-portfolios will play an important part in future evaluation techniques, allowing LIS students to display their abilities, growth, and successes through research, digital library projects, reflections, and multimedia presentations.	E-Portfolios as Comprehensive Evaluation Tools Holistic Evaluation and Skill Demonstration
"I appreciate the convenience of digital assessments, but I feel that the personal interaction and immediate feedback from face-to-face evaluations in focus areas such as cataloguing, classification and subject analysis are irreplaceable. The human connection in traditional assessments motivates me to perform better and engages me more deeply in learning." (Student 13)	Respondent highlights concern with personal interaction and rapid feedback in areas such as cataloguing, classification, and subject analysis, where traditional assessments are regarded as irreplaceable in generating motivation and deeper engagement in learning.	The Importance of Personal Interaction and Immediate Feedback Motivation and Participation in Traditional Assessments
"Authenticity in assessments is more than just format or content; it is also about relevance to our local socio-cultural contexts." We require assessments that address our community-specific requirements and issues, allowing us to impact the LIS field significantly."* (Student 03)	Respondent describes how authentic evaluations should be relevant to local socio-cultural contexts and address community-specific requirements and concerns to have a meaningful impact on the LIS sector.	Empowerment and Contextual Relevance Social Impact and Community Participation
Online tests can feel lonely at times, especially when learning remotely. Collaborative evaluations that promote teamwork and peer-to-peer learning would be a welcome improvement, allowing us to learn from one another while also developing key social skills." (Student 15)	Respondent shares experiences of feeling isolated and describes how integrating collaborative evaluations that promote teamwork and peer-to-peer learning would improve the learning experience	Getting Over Isolation Through Collaboration Development of Social Skills and Peer Learning

	while supporting social skills development.	

4.4 Critically analyse the debates on student assessment in LIS education

The research explores the critical debates on student assessment in LIS education, including humanising, communication, power negotiation, empowerment, entitlement, persuasion, substitution, and radical pedagogy and digital assessments versus traditional assessments. The formulated meanings recognise the efficiency and accessibility benefits of digital assessment while emphasising the need to address limitations and challenges related to algorithmic assessment and digital literacy skills among students. The formulated meanings of the statement of students illustrate the advocacy for a blended approach of traditional and digital methods. It illuminates the value of face-to-face interactions and critical thinking in traditional assessments and the benefits of flexibility, quick feedback, and technological integration in digital assessments. The formulated meanings draw attention to the conflicting views on efficiency and uniformity with the advocacy for realistic, context-based assessments, emphasising the significance of striking a balance between both perspectives. The analysis demonstrates the LIS expert's acknowledgement of digital assessment's transformational potential in LIS education while highlighting reasonable concerns regarding privacy, security, and technological problems that may undermine the reliability and integrity of assessments. Another viewpoint of the LIS educator argues for a balanced approach to the dispute over digital versus traditional evaluation. The formulated meaning emphasises the complementing qualities of each technique, with digital assessments providing efficiency and rapid response and conventional evaluations encouraging critical thinking and interpersonal interactions. A further formulated meaning represents the perspective of a LIS educator who recognises digital assessment's benefits while emphasising the importance of pedagogical principles and skill development. They illuminate the significance of striking a balance between technical improvements and the fundamental concepts of LIS education. Examining these comments and formulated meanings illustrates the complicated and multidimensional character of student assessment discussions in LIS education. The themes depict opposing opinions and the necessity for a middle ground that blends the benefits of digital evaluation with the authenticity and contextualisation provided by traditional assessment methods to advance the skills of future LIS professionals. Table 3 presents the summaries of the analysis of significant statements and their conversion to formulated meanings, clusters and emerging themes.

Table 3: Results of critical analysis of the debate on student assessment in LIS education

Significant statement	Formulated meaning	Emerging theme
"In terms of efficiency, accessibility, and scalability, digital assessment offers numerous advantages." It supports synchronous feedback, automated grading, and the incorporation of multimedia elements. However, its limitations, such as potential biases in algorithmic assessment and the requirement for digital literacy skills among pupils, must be carefully considered." (LIS expert 01)	Respondent argues that any biases in algorithmic evaluation and the demand for students to have digital literacy abilities must be carefully considered.	Digital Assessment Benefits: Efficiency and Accessibility **Limitations and Difficulties: Biases and Digital Literacy**
"I believe that a blended assessment approach is the way to go." Traditional	Respondent describes a blended assessment	Combined Traditional and

examinations provide valuable face-to-face interactions and critical thinking opportunities, whereas digital tests provide flexibility, quick feedback, and technology integration. The finest of both worlds can be combined to provide a more inclusive and engaging assessment experience." (Student 11)	approach that combines traditional exams and digital tests that offers the best of both worlds, with valuable face-to-face interactions, critical thinking opportunities, flexibility, quick feedback, and technology integration, resulting in a more inclusive and engaging assessment experience.	Digital Assessment Methods **Improving Assessment Inclusivity and Engagement**
"The debate over digital versus traditional assessment stems from a larger debate about the purpose of assessment in education." Some say that digital assessment promotes speed and standardisation, while others argue that realistic, contextualised examinations that represent real-world events and abilities are required. I think it is critical to strike a balance between both points of view." (TandL administrator 05)	Respondent's take is that the dispute over digital vs traditional assessments arises from conflicting perspectives, with some prioritising speed and standardisation and others arguing for realistic, context-specific exams that reflect the real world.	Assessment Purpose: Efficiency and Standardisation versus. Authenticity **A Balance in Assessment Methodologies**
"The debate over digital versus traditional assessments should not be seen as either-or." Instead, we should combine each technique's advantages to develop a holistic assessment framework. Traditional examinations allow for more critical thinking and human connections, whereas online evaluations can improve efficiency and provide real-time feedback."	Respondent argues that rather than perceiving the conflict between digital and traditional exams as either/or, combining each technique's benefits creates a holistic assessment framework in line with needs.	Combining the Strengths of Digital and Traditional Assessment **A Framework for Assessment Using a Balanced Approach**
"The debate over digital assessments reflects broader concerns about the effect of technology on education." While digital assessment has benefits, we must guarantee that it adheres to pedagogical frameworks and does not jeopardise the development of critical skills. It is critical to balance technical improvements and the essential ideas of LIS education."	Respondent raises concerns that despite the advantages of digital assessments, they must be aligned with pedagogical frameworks and promote the development of crucial skills to strike a balance between technological improvements and the	Striking a Balance: Technological Advances and Fundamental Principles **Ensuring Pedagogical Principles Alignment**

	fundamental concepts of LIS education.	

4.5 Explore and gain insights into the dimensions and experiences associated with feedback and formative assessments in new assessment tools for LIS education in the post-pandemic future

Feedback is crucial based on the participants' responses. Feedback is critical to student learning and development. More importantly, effective feedback informs students about their progress, isolates areas for improvement and frames a pathway to reaching their learning targets. Accordingly, we must improve feedback's effectiveness and impact on learning outcomes by enhancing our understanding of student experiences of feedback and associated components. Feedback research is necessary because it advances educational techniques, student involvement, and academic performance. We can improve the learning experience, adapt to shifting contexts, and ultimately improve the quality of education in the post-pandemic future by investigating and obtaining insights from feedback and formative assessments in new assessment tools for higher education. Consequently, research objective five dives into the characteristics and experiences of feedback and formative assessments, their intricacies and complexities in novel assessment tools for post-pandemic using the lens of LIS education. The analysis offers a window into the features and experiences associated with feedback and formative assessments in LIS education. The outcome themes illustrate the fundamental elements and considerations with theory-practice integration, individualised feedback, skill enhancement, technology experimentation, peer feedback, cooperation, professional growth and teamwork. Table 4 demonstrates how examples of how significant statements transitioned to formulated meanings and converted to cluster and emerging themes. The analysis offers a window into the features and experiences associated with feedback and formative assessments in LIS education. The outcome themes illustrate the fundamental elements and considerations with theory-practice integration, individualised feedback, skill enhancement, technology experimentation, peer feedback, cooperation, professional growth and teamwork. More details of the study's findings by highlighting a few significant statements, the formulated meanings, clusters and emerging themes are given in Table 4.

Table 4: Results of insights into feedback in new assessment tools for LIS education

Significant statement	Formulated meaning	Emerging theme
"As a postgraduate student in Records Management, timely and constructive feedback has been invaluable in deepening my understanding of electronic record management and equipping me with necessary skills." It assists me in bridging the theoretical and practical gaps." (Student 17)	Respondent emphasises the significance of timely and constructive criticism and highlights the importance of feedback in developing approaches that solve real-world situations of users of LIS services.	Timely Feedback, Constructive Feedback, Deepening Understanding, Critical Thinking **Theory-Practice Integration**.
"Providing formative feedback is critical in helping a student with selection, preservation, and organisation of digital	Respondent recognises the role of formative feedback in guiding students' digital	Skill Refinement

artefacts in the context of digital curation." It helps students to hone their curatorial skills and promotes deliberate decision-making in an ever-changing digital landscape." (LIS expert E)	curation competencies for enhanced decision-making in changing digital environments.	**Thoughtful Decision-Making**.
"In courses like Library and Society, formative assessments allow students to investigate libraries' social and cultural dimensions." We hope to enhance their knowledge of other perspectives and stimulate self-reflection as they work to become socially responsible information workers and social advocates, maintain the rights of all people, and meet the needs of communities through ongoing feedback." (TandL administrator 02)	The respondent underlines the value of formative evaluations in specific courses and illuminates how continuous feedback is essential in assisting students in promoting human rights, meeting community needs, and embracing diversity in their professional activities.	Social and Cultural Dimensions of Libraries Stimulating Self-Reflection Social Responsibility in LIS Work Advocacy and Human Rights **Ongoing Feedback for Development**
"I value the structured feedback I receive in the Information Retrieval course." It assists me in identifying my strengths and areas for improvement, resulting in improved search techniques and knowledge retrieval skills." (Student 09)	Respondent expresses the need for tailored feedback in the context of a course, information retrieval, allowing students to improve their search tactics and information-seeking abilities.	Skill Enhancement **Personalised Feedback**
"In the digital environment, formative assessments in a Digital Libraries module allow students to experiment with various technologies and evaluate their effectiveness in improving information access." Feedback assists the students to critically engage and analyse their options and make guided selections." (LIS expert J)	Respondent describes experiences with formative assessments allowing students to investigate and evaluate digital technologies in the context of a digital libraries module, with feedback assisting critical thinking processes.	Technological Experimentation
"Peer feedback activities have been integrated into the Library and Information Science Practicum, fostering a collaborative learning environment." Students receive insights from the viewpoints of their classmates, increasing their career development and experiential learning and preparing them for industry teamwork." (TandL administrator 05)	Respondent signposts the implementation of peer evaluation activities in the practicum, which promotes collaboration and provides students with various views for professional development, experiential	Professional Growth

	learning, mentorship and team skills.	

5. Discussion

Online teaching, learning and evaluations provided continuity during the pandemic (Adedoyin, and Soykan, 2023). Online assessments offer affordances and opportunities to rethink and realign them post-pandemic and advance new frontiers for evaluation. Nevertheless, they reveal several limitations, deficiencies and challenges to providing effective and equitable education (Maatuk, Elberkawi, Aljawarneh, Rashaideh, and Alharbi, 2022). This change has driven the development and use of novel evaluation techniques and digital media to assess student learning outcomes in education. However, COVID-19-driven approaches require careful consideration. Some of the fundamental issues brought to the eye of scholarly analysis are the themes that frame the discussion. The discussion is organised in the order of the research objectives.

5.1 Identify the advantages and disadvantages of using new assessment tools post-COVID-19 in LIS education

Digital assessments integrate theory and practice in real-life contexts by comprehensively understanding multimedia-driven assessment benefits and setbacks in LIS education. The interview analysis shows they offer quick feedback, helping students bridge the gap between theory and real-world application. Data-driven insights identify challenges and inform instructional techniques. Digital assessments foster community involvement, peer-to-peer learning, and collaboration through virtual and augmented reality tools. The fundamental results confirm the arguments of constructivist learning theory (CLT) on the importance of socio-cultural elements determining e-assessments' benefits and drawbacks in facilitating active engagement and meaningful learning experiences. Mayer (2021) and Buzhardt, and Meadan (2022) report that properly structured multimedia integration results in higher learning and knowledge transfer levels than conventional text-driven training. Hulaikah, Degeng, and Murwani (2020) and Sanchez-Muñoz, Carrió, Rodríguez, Pérez, and Moyano (2022) provide evidence of data-driven insights from data generated from digital assessments of students' weaknesses and strengths to monitor where students are challenged with practical application and help rethink instructional techniques and interventions at bridging the gap between theory and practice. Respondents in the current study raise numerous concerns about the disadvantages and challenges of digital assessments. Mitigating some of them for more effective integration of multimedia, bridging theory and practices, and fostering community and culture of online learning and assessment environments involves support for economically disadvantaged students, practices that bridge the digital divide, combining digital and non-digital assessments, providing structured opportunities for collaborative activities and balancing technology with human interaction (Ebadi, Karimi, and Vakili, 2023; Widiastuti, Mantra, Sukoco, and Santosa, 2021).

5.2 Examine the role of digital media in student assessment

The interview analysis indicates diverse meanings and themes connected to digital media in student assessment using social and cultural learning. Tapingkae, Panjaburee, Hwang, and Srisawasdi (2020) and Loureiro, and Gomes (2023) corroborate the findings in the current study that digital assessments allow students to incorporate diverse social and cultural perspectives, encourage collaborative and authentic learning experiences and improve

communication and expression skills. Respondents in the current study have raised concerns about the possibility of separation and isolation produced by digital assessments, illuminating the significance of preserving human connection and understanding. The findings imply the centrality of equality in gaining access to social and cultural learning opportunities, overcoming technological challenges and assisting marginalised and underrepresented populations. The concept of learner engagement by CLT illuminated itself in this study. The learning context, the relevance of the LIS topic area to the learner's experiences and the opportunities for reflection and active participation are vital. The balance between originality and depth of knowledge in digital evaluations is crucial. The CLT emphasises constructs, such as knowledge building and collaborative learning, with the results emphasising socio-cultural elements influencing learner engagement and learning outcomes. Students' engagement with peers and participation in digital media-led group assessment activities facilitate the construction of knowledge. We can rethink how cultural norms, social interactions and collaborative learning experiences affect knowledge acquisition and meaning-making using digital media in assessment contexts. Sergeyeva, Bronin, and Turlakova (2022), Meijer, Brouwer, Hoekstra, and Strijbos (2022), and Madaio *et al.* (2022) corroborate the results in the current study stressing the multidisciplinary character of digital media assessments and the value of collaborative learning and peer assessments, and the difficulties in guaranteeing fairness and inclusivity. In short, the current study provides a deeper understanding of digital media in student evaluation, particularly regarding social and cultural learning.

5.3 Explore authenticity issues in student e-assessment in LIS education

Analysis of interview data reveals several articulated meanings and themes linked to authentic assessments and evaluation approaches in LIS education. There is an increasing realisation of the necessity to incorporate real-world projects, internships, and industry collaborations for realistic assessment beyond standard tests and papers. Concerns were raised, however, about the authenticity and trustworthiness of online evaluations, emphasising the significance of maintaining academic integrity and addressing the issues of cheating and reliance on external resources. The findings emphasise the digital divide and the importance of ensuring equitable access to online examinations to promote equal participation among students. The reassessment of assessment practices prompted by COVID-19, requires realignment in carefully and intentionally using interactive multimedia projects and e-portfolios to encourage critical thinking, creativity and communication abilities. Furthermore, the significance of personal connection, quick feedback, and the motivational components of conventional evaluations was recognised, emphasising their role in greater engagement and learning. The findings highlight the importance of context-specific evaluations that address community-specific needs and empower the LIS sector. Finally, incorporating collaborative assessments that promote teamwork, peer learning, and the development of social skills was beneficial for overcoming feelings of isolation. The results show a direct connection between knowledge development and learner engagement. For instance, respondents describe how ensuring authenticity in assessments fosters active engagement by allowing learners to relate their experiences and existing knowledge to the assessment activities, thereby contributing to the development of authentic understanding in line with the assumptions and arguments of the CLT. These findings are consistent with previous research on the changing nature of assessments and the need for accurate, contextually relevant, and inclusive evaluation procedures (Dawson, and Bearman, 2020; Brown, 2020).

5.4 Critically analyse the debates on student assessment in LIS education

The interview data analysis shows various defined meanings and emerging themes connected to the contrast between digital and traditional LIS education assessments. There are opposing viewpoints and disputes identified in the literature over digital versus traditional examinations. While some push for efficiency and standardisation, others advocate authenticity and context-specific tests that mirror real-world scenarios. However, the study shows that a balanced approach incorporating the benefits of both digital and conventional assessment methods can result in a more inclusive and engaging assessment experience. Considering potential biases in algorithmic evaluation and ensuring that LIS students have essential digital literacy abilities is critical. Furthermore, to balance technology improvements and the essential principles of LIS education, the alignment of digital assessments with pedagogical frameworks and encouraging critical skill development are highlighted. This study adds to the current literature by emphasising the need to consider several perspectives and implement a holistic evaluation framework that includes both the benefits and limits of digital and traditional assessment methods. Popham (2006) argues that traditional evaluations like written examinations and essays provide a reliable and valid measure of students' knowledge and skills. The author stresses the significance of standardisation and comparability in evaluating student achievement. Jaggars and Xu (2016) support digital assessments for collecting rich data that may be used for diagnostic purposes and to inform instructional practices. They emphasise the value of digital assessments in offering real-time analytics and individualised learning paths. Assessment tools' effectiveness depends on contexts, topic areas and specific learning outcomes. Applying CLT to examine assessment debates critically allows us to consider how the socio-cultural framing of LIS education may shape, reshape and inform these arguments, impacting ways to evaluate and build knowledge among students and develop capacity for faculty and TandL administrators to sustain using digital assessment solutions.

5.5 Explore and gain insights into the dimensions and experiences associated with feedback and formative assessments in new assessment tools for LIS education in the post-pandemic future

Timely and constructive feedback is vital for increasing students' learning, developing critical thinking, and integrating theory and practice. The study underlines the need for formative evaluations to establish digital curation abilities, improve decision-making skills in changing digital environments, and address libraries' social and cultural components. Customised and personalised feedback is critical for skill development and enhancing information retrieval and search methods. Furthermore, including peer evaluation activities in practicum experiences promotes collaboration, professional development, experiential learning, mentorship, and team skills. These findings are consistent with previous research (such as Dahal, Luitel, Pant, and Rajbanshi, 2022; Yüksel, and Başaran, 2020). The results are on the importance of feedback as a stimulant for student development and the incorporation of real-world situations in education. The study adds to the body of knowledge by emphasising the specific parts of feedback and formative assessments that improve students' skills, critical thinking, social responsibility, and professional progress in LIS. Aspects of feedback and assessments, such as constructive criticism, specific guidance, and self-reflection opportunities, allow students to critically evaluate their work and progress critically, thereby improving their future career success using reflections on their strengths and weaknesses that require further development. Digital assessments afford collaborative learning experiences that enhance the usefulness of feedback and formative assessments in new ways, such as promoting knowledge creation.

6. Conclusion

Incorporating the CLT into understanding e-assessments in LIS education sheds light on supporting the broader understanding of how learners construct knowledge and meaning in e-assessment contexts. Digital examinations afford improved accessibility for remote participation, allowing options for students with limitations, such as geographical or physical disabilities. The power of instant feedback from digital quizzes and tests will enable students to access information about their performance in a record time. This enhances self-correction, timely introspection and a better knowledge of course content and topics. With digital assessments, students can more effectively identify areas for improvement and implement correction activities. Rof, Bikfalvi, and Marques (2022) provide evidence that digital examinations are tailored to meet individual student's learning styles and requirements. Personalised learning experiences focusing on strengths and limitations based on adaptive assessments to change difficulty levels and module materials according to the student's performance (Minn, 2022). Integrating rich multimedia into assessments, such as interactive simulations, photographs, and films, deliver information to students in dynamic formats corresponding to real-world circumstances to enhance comprehension, engagement and knowledge retention. Digital assessments extend the frontiers of possibilities for putting theory into practice allowing students to apply their knowledge and skills in real-world settings by improving their problem-solving capacity and decision-making. Hardware and software are critical for the drawbacks and disadvantages to be minimised, and dependable access to the internet is provided. LIS educators and administrators require training and professional development in designing and administrating digital assessments and pedagogical strategies, diverse methods and best practices for efficiency. Sustainability plans require long-term issues, such as funding, resource allocation, and technical and human resources, to continue to support digital assessments post-COVID-19. The study has limitations. For instance, the conclusions are based on a small sample size drawn from a few LIS schools, and time and methodological constraints. Finally, future studies may use larger sample sizes, including more diverse contexts, be more comparative, explore longitudinal approaches to explore the impact of sustainability interventions and evaluate the effectiveness of intervention efforts in filling gaps.

References

Aashima, Nanda, M., & Sharma, R. (2021). A review of patient satisfaction and experience with telemedicine: a virtual solution during and beyond COVID-19 pandemic. *Telemedicine and e-Health*, *27*(12), 1325-1331.

Abraham, G. Y. (2014). Critical pedagogy: Origin, vision, action & consequences. *KAPET*, *10*(1), 90-98.

Adedoyin, O. B., & Soykan, E. (2023). Covid-19 pandemic and online learning: the challenges and opportunities. *Interactive learning environments*, *31*(2), 863-875.

Akimov, A., & Malin, M. (2020). When old becomes new: a case study of oral examination as an online assessment tool. *Assessment & Evaluation in Higher Education*, *45*(8), 1205-1221.

Alanazi, A. (2016). A critical review of constructivist theory and the emergence of constructionism. *American Research Journal of Humanities and Social Sciences*, *2*, 1-8.

Bashir, A., Bashir, S., Rana, K., Lambert, P., & Vernallis, A. (2021). Post-COVID-19 adaptations; the shifts towards online learning, hybrid course delivery and the implications for biosciences courses in the higher education setting. In *Frontiers in Education* (p. 310). Frontiers.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology*, *3*(2), 77-101.

Braun, V., & Clarke, V. (2022). Conceptual and design thinking for thematic analysis. *Qualitative Psychology*, *9*(1), 3.

Braun, V., & Clarke, V. (2023). Toward good practice in thematic analysis: Avoiding common problems and be (com) ing a knowing researcher. *International Journal of Transgender Health*, *24*(1), 1-6.

Brown, S. (2020). *Learning, teaching and assessment in higher education: global perspectives*. Bloomsbury Publishing.

Buzhardt, J., & Meadan, H. (2022). Introduction to the special issue: A new era for remote early intervention and assessment. *Journal of Early Intervention*, *44*(2), 103-109.

Cameron-Standerford, A., Menard, K., Edge, C., Bergh, B., Shayter, A., Smith, K., & VandenAvond, L. (2020, November). The phenomenon of moving to online/distance delivery as a result of COVID-19: Exploring initial perceptions of Higher Education Faculty at a Rural Midwestern University. In *Frontiers in Education* (Vol. 5, p. 583881). Frontiers Media SA.

Chaudhry, I. S., Sarwary, S. A. M., El Refae, G. A., & Chabchoub, H. (2023). Time to Revisit Existing Student's Performance Evaluation Approach in Higher Education Sector in a New Era of ChatGPT—A Case Study. *Cogent Education*, *10*(1), 2210461.

Chirinda, B., Ndlovu, M., & Spangenberg, E. (2021). Teaching mathematics during the COVID-19 lockdown in a context of historical disadvantage. *Education Sciences*, *11*(4), 177.

Chuang, S. (2021). The applications of constructivist learning theory and social learning theory on adult continuous development. *Performance Improvement*, *60*(3), 6-14.

Clark, T. M., Callam, C. S., Paul, N. M., Stoltzfus, M. W., & Turner, D. (2020). Testing in the time of COVID-19: A sudden transition to unproctored online exams. *Journal of chemical education*, *97*(9), 3413-3417.

Colón-Aguirre, M., & Cooke, N. A. (2022). LibCrit: Moving Toward an Ethical and Equitable Critical Race Theory Approach to Social Justice in Library and Information Science. *Journal of Information Ethics*, *31*(2), 57-69.

Comas-Forgas, R., Lancaster, T., Calvo-Sastre, A., & Sureda-Negre, J. (2021). Exam cheating and academic integrity breaches during the COVID-19 pandemic: An analysis of internet search activity in Spain. *Heliyon*, *7*(10), e08233.

Cotton, D. R., Cotton, P. A., & Shipway, J. R. (2023). Chatting and cheating: Ensuring academic integrity in the era of ChatGPT. *Innovations in Education and Teaching International*, 1-12.

Creswell, J. W. (2014). *A concise introduction to mixed methods research*. SAGE publications.

Dahal, N., Luitel, B. C., Pant, B. P., & Rajbanshi, R. (2022). Enhancing student-teachers assessment skills: A self-and peer-assessment tool in higher education. *International Journal of Education and Practice*, *10*(4), 313-321.

Dawson, P., & Bearman, M. (2020). *Concluding Comments: Reimagining University Assessment in a Digital World* (pp. 291-296). Springer International Publishing.

Dewey, J., Montessori, M., Strzemiński, W., Piaget, J., Vygotsky, L., von Foerster, H., ... & Morin, E. (1997). Constructivism (learning theory). *Journal of Social Sciences, Literature and Languages*, 9-16.

Ebadi, S., Karimi, E., & Vakili, S. (2023). An exploration into EFL learners' perspectives on online computerized listening comprehension dynamic assessment. *Language Testing in Asia*, *13*(1), 5.

Eyisi, D. (2016). The usefulness of qualitative and quantitative approaches and methods in researching problem-solving ability in science education curriculum. *Journal of education and practice*, *7*(15), 91-100.

Fernando, S. Y., & Marikar, F. M. (2017). Constructivist Teaching/Learning Theory and Participatory Teaching Methods. *Journal of Curriculum and Teaching*, *6*(1), 110-122.

Finlay, L. (2021). Thematic Analysis:: The 'Good', the 'Bad'and the 'Ugly'. *European Journal for Qualitative Research in Psychotherapy*, *11*, 103-116.

García-Alberti, M., Suárez, F., Chiyón, I., & Mosquera Feijoo, J. C. (2021). Challenges and experiences of online evaluation in courses of civil engineering during the lockdown learning due to the COVID-19 pandemic. *Education Sciences*, *11*(2), 59.

Ghosh, S., Bowles, M., Ranmuthugala, D., & Brooks, B. (2015). Using authentic assessment to enhance seafarer student engagement and their ability to transfer learning. In *16th Annual General Assembly of the International Association of Maritime Universities* (pp. 93-98).

Gill, S. L. (2020). Qualitative sampling methods. *Journal of Human Lactation*, *36*(4), 579-581.

Godsk, M. (2022). Learning Design as an efficient educational development methodology: conceptualization, assessment, and practice. In *Handbook of Digital Higher Education* (pp. 38-50). Edward Elgar Publishing.

Grey, C., Knights, D., & Willmott, H. (1996). Is a critical pedagogy of management possible. *Rethinking management education*, 94-110.

Hasanov, A., Laine, T. H., & Chung, T. S. (2019). A survey of adaptive context-aware learning environments. *Journal of Ambient Intelligence and Smart Environments*, *11*(5), 403-428.

Huggins, S. (2017). Practice-based learning in LIS education: an overview of current trends. *Library Trends*, *66*(1), 13-22.

Hulaikah, M., Degeng, I., & Murwani, F. D. (2020). The Effect of Experiential Learning and Adversity Quotient on Problem Solving Ability. *International Journal of Instruction*, *13*(1), 869-884.

Islam, M. A., & Aldaihani, F. M. F. (2022). Justification for adopting qualitative research method, research approaches, sampling strategy, sample size, interview method, saturation, and data analysis. *Journal of International Business and Management*, *5*(1), 01-11.

Ismail, H., Khelifi, A., & Harous, S. (2022). A Cognitive Style Based Framework for Usability Evaluation of Online Lecturing Platforms-A Case Study on Zoom and Teams. *International Journal of Engineering Pedagogy*, *12*(1), 104-122.

Jaggars, S. S., & Xu, D. (2016). How do online course design features influence student performance?. *Computers & Education*, *95*, 270-284.

Jiang, J. P., Hu, J. Y., Zhang, Y. B., & Yin, X. C. (2022). Fostering college students' critical thinking skills through peer assessment in the knowledge building community. *Interactive Learning Environments*, 1-17.

Joshi, A., Vinay, M., & Bhaskar, P. (2021). Impact of coronavirus pandemic on the Indian education sector: perspectives of teachers on online teaching and assessments. *Interactive technology and smart education*, *18*(2), 205-226.

Kamal, M., Abo Omirah, M., Hussein, A., & Saeed, H. (2021). Assessment and characterisation of post-COVID-19 manifestations. *International journal of clinical practice*, *75*(3), e13746.

Kebritchi, M., Lipschuetz, A., & Santiague, L. (2017). Issues and challenges for teaching successful online courses in higher education: A literature review. *Journal of Educational Technology Systems*, *46*(1), 4-29.

Keddem, S., Barg, F. K., & Frasso, R. (2021). Peer reviewed: practical guidance for studies using freelisting interviews. *Preventing Chronic Disease*, *18*.

Kirylo, J. D., Thirumurthy, V., Smith, M., & McLaren, P. (2010). Issues in education: Critical pedagogy: An overview. *Childhood Education*, *86*(5), 332-334.

Kosimov, A. (2022). The Importance of Choosing Appropriate Assessment Tools in Language Teaching and its Impact to Second Language Acquisition. *British View*, *7*(1).

Kurtz, H., Lloyd, S., Harwin, A., Chen, V., & Furuya, Y. (2021). Student Mental Health during the Pandemic: Educator and Teen Perspectives. *Editorial Projects in Education*.

Landreneau, K. J., & Creek, W. (2009). Sampling strategies. *Available on: http://www. natco1. org*.

Lemay, D. J., Bazelais, P., & Doleck, T. (2021). Transition to online learning during the COVID-19 pandemic. *Computers in human behavior reports*, *4*, 100130.

Liu, C. H., & Matthews, R. (2005). Vygotsky's Philosophy: Constructivism and Its Criticisms Examined. *International education journal*, *6*(3), 386-399.

Loureiro, P., & Gomes, M. J. (2023). Online peer assessment for learning: findings from higher education students. *Education Sciences*, *13*(3), 253.

Lynch, M., Sage, T., Hitchcock, L. I., & Sage, M. (2021). A heutagogical approach for the assessment of Internet Communication Technology (ICT) assignments in higher education. *International Journal of Educational Technology in Higher Education*, *18*(1), 55.

Maatuk, A. M., Elberkawi, E. K., Aljawarneh, S., Rashaideh, H., & Alharbi, H. (2022). The COVID-19 pandemic and E-learning: challenges and opportunities from the perspective of students and instructors. *Journal of computing in higher education*, *34*(1), 21-38.

Madaio, M., Egede, L., Subramonyam, H., Wortman Vaughan, J., & Wallach, H. (2022). Assessing the Fairness of AI Systems: AI Practitioners' Processes, Challenges, and Needs for Support. *Proceedings of the ACM on Human-Computer Interaction*, *6*(CSCW1), 1-26.

Magnuson, M. L. (2013). Web 2.0 and information literacy instruction: Aligning technology with ACRL standards. *The Journal of Academic Librarianship*, *39*(3), 244-251.

Makransky, G., Mayer, R., Nøremølle, A., Cordoba, A. L., Wandall, J., & Bonde, M. (2020). Investigating the feasibility of using assessment and explanatory feedback in desktop virtual reality simulations. *Educational Technology Research and Development*, *68*, 293-317.

Marín, V. I., Carpenter, J. P., Tur, G., & Williamson-Leadley, S. (2022). Social media and data privacy in education: an international comparative study of perceptions among pre-service teachers. *Journal of Computers in Education*, 1-27.

Marks, A., & Al-Ali, M. (2022). Digital transformation in higher education: a framework for maturity assessment. In *COVID-19 Challenges to University Information Technology Governance* (pp. 61-81). Cham: Springer International Publishing.

Mayer, R. E. (2021). Evidence-based principles for how to design effective instructional videos. *Journal of Applied Research in Memory and Cognition*, *10*(2), 229-240.

McArthur, J. (2023). Rethinking authentic assessment: work, well-being, and society. *Higher education*, *85*(1), 85-101.

Meijer, H., Brouwer, J., Hoekstra, R., & Strijbos, J. W. (2022). Exploring Construct and Consequential Validity of Collaborative Learning Assessment in Higher Education. *Small Group Research*, *53*(6), 891-925.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook*. sage.

Minn, S. (2022). AI-assisted knowledge assessment techniques for adaptive learning environments. *Computers and Education: Artificial Intelligence*, 100050.

Moratilla, N. C. A. (2019). Revisiting Paulo: Critical Pedagogy and Testimonial Narratives as Liberative Spaces in the Philippines' K-12 Curriculum. *Journal for Critical Education Policy Studies (JCEPS)*, *17*(2).

Nomdo, G. (2023). Unpacking the notion of'criticality'in liberatory praxis: A critical pedagogy perspective. *Critical Studies in Teaching and Learning (CriSTaL)*, *11*(si1), 50-70.

Noor Azizi, N. A., & Kaur, K. (2023). Indicators for Modernising the LIS Internship: Evidences from a systematic literature review. *Journal of Librarianship and Information Science*, 09610006231154536.

Odgers, C. L., & Jensen, M. R. (2020). Annual research review: Adolescent mental health in the digital age: Facts, fears, and future directions. *Journal of Child Psychology and Psychiatry*, *61*(3), 336-348.

Ortlipp, M. (2008). Keeping and using reflective journals in the qualitative research process. *The qualitative report*, *13*(4), 695-705.

Ozkara, B. O., & Cakir, H. (2020). Comparison of Collaborative and Individual Learning in Online Learning. *Turkish Online Journal of Educational Technology-TOJET*, *19*(4), 66-74.

Pais, S., & Hall, A. (2021, September). Using Kahoot! to Enhance the Motivation of Undergraduate Students of Tourism in Mathematics Classes-A Case Study. In *European Conference on Games Based Learning* (pp. 591-XX). Academic Conferences International Limited.

Popham, W. J. (2006). Assessment for Learning: An Endangered Species?. *Educational Leadership*, *63*(5), 82-83.

Pophiwa, N., Deliwe, C. N., Mathe, J., & Taylor, S. (2020). Using evaluations to inform policy and practice in a government department: the case of the Department of Basic Education in South Africa. In *Using Evidence in Policy and Practice* (pp. 75-91). Routledge.

Prahani, B. K., Deta, U. A., Yasir, M., Astutik, S., Pandiangan, P., Mahtari, S., & Mubarok, H. (2020). The Concept of" Kampus Merdeka" in Accordance with Freire's Critical Pedagogy. *Studies in Philosophy of Science and Education*, *1*(1), 21-37.

Rahwan, I., Krasnoshtan, D., Shariff, A., & Bonnefon, J. F. (2014). Analytical reasoning task reveals limits of social learning in networks. *Journal of The Royal Society Interface*, *11*(93), 20131211.

Raju, J. (2021). Shaping LIS education for blended professionals in a pluralist information environment: global reflections. *Journal of Education for Library and Information Science*, *62*(4), 366-382.

Rof, A., Bikfalvi, A., & Marques, P. (2022). Pandemic-accelerated digital transformation of a born digital higher education institution. *Educational Technology & Society*, *25*(1), 124-141.

Rudolph, J., Tan, S., & Tan, S. (2023). War of the chatbots: Bard, Bing Chat, ChatGPT, Ernie and beyond. The new AI gold rush and its impact on higher education. *Journal of Applied Learning and Teaching*, *6*(1).

Rudolph, J., Tan, S., & Tan, S. (2023). War of the chatbots: Bard, Bing Chat, ChatGPT, Ernie and beyond. The new AI gold rush and its impact on higher education. *Journal of Applied Learning and Teaching*, *6*(1).

Salamzadeh, A. (2020). Five approaches toward presenting qualitative findings. *Journal of the International Academy for Case Studies*, *26*(3), 1-2.

Saleebey, D., & Scanlon, E. (2005). Is a critical pedagogy for the profession of social work possible?. *Journal of Teaching in Social Work*, *25*(3-4), 1-18.

Sanchez-Muñoz, R., Carrió, M., Rodríguez, G., Pérez, N., & Moyano, E. (2022). A hybrid strategy to develop real-life competences combining flipped classroom, jigsaw method and project-based learning. *Journal of Biological Education*, *56*(5), 540-551.

Sellers, C. S., & Akers, R. L. (2018). Social learning theory: Correcting misconceptions. In *The essential criminology reader* (pp. 89-99). Routledge.

Selwyn, N., O'Neill, C., Smith, G., Andrejevic, M., & Gu, X. (2023). A necessary evil? The rise of online exam proctoring in Australian universities. *Media International Australia*, *186*(1), 149-164.

Sergeyeva, T., Bronin, S., & Turlakova, N. (2022, April). Multidisciplinary Dimension of E-Learning in the Innovative Eco-System of a Modern University. In *2022 International Conference on Smart Information Systems and Technologies (SIST)* (pp. 1-8). IEEE.

Serrano, M. M., O'Brien, M., Roberts, K., & Whyte, D. (2018). Critical Pedagogy and assessment in higher education: The ideal of 'authenticity' in learning. *Active Learning in Higher Education*, *19*(1), 9-21.

Solarino, A. M., & Aguinis, H. (2021). Challenges and best-practice recommendations for designing and conducting interviews with elite informants. *Journal of Management Studies*, *58*(3), 649-672.

Swaffield, S. (2011). Getting to the heart of authentic assessment for learning. *Assessment in Education: Principles, Policy & Practice*, *18*(4), 433-449.

Tapingkae, P., Panjaburee, P., Hwang, G. J., & Srisawasdi, N. (2020). Effects of a formative assessment-based contextual gaming approach on students' digital citizenship behaviours, learning motivations, and perceptions. *Computers & Education*, *159*, 103998.

Tran, V. T., Riveros, C., Clepier, B., Desvarieux, M., Collet, C., Yordanov, Y., & Ravaud, P. (2022). Development and validation of the long coronavirus disease (COVID) symptom and impact tools: a set of patient-reported instruments constructed from patients' lived experience. *Clinical Infectious Diseases*, *74*(2), 278-287.

Villarroel, V., Bloxham, S., Bruna, D., Bruna, C., & Herrera-Seda, C. (2018). Authentic assessment: creating a blueprint for course design. *Assessment & Evaluation in Higher Education*, *43*(5), 840-854.

Villarroel, V., Bloxham, S., Bruna, D., Bruna, C., & Herrera-Seda, C. (2018). Authentic assessment: creating a blueprint for course design. *Assessment & Evaluation in Higher Education*, *43*(5), 840-854.

Webber-Ritchey, K. J., Aquino, E., Ponder, T. N., Lattner, C., Soco, C., Spurlark, R., & Simonovich, S. D. (2021). Recruitment strategies to optimize participation by diverse populations. *Nursing Science Quarterly*, *34*(3), 235-243.

Widiastuti, I. A. M. S., Mantra, I. B. N., Sukoco, H., & Santosa, M. H. (2021). Online assessment strategies to enhance students' competence and their implementational challenges. *JEES (Journal of English Educators Society)*, *6*(2).

Wiggins, G. P., & McTighe, J. (2005). *Understanding by design*. Ascd.

Yüksel, İ., & Başaran, B. Ç. (2020). Reflective peer feedback in the practicum: Qualitative and quantitative practices. *Turkish Online Journal of Qualitative Inquiry*, *11*(1), 85-109.