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EXPLORING DIGITAL ALTERNATIVES FOR LEARNING ASSESSMENT: A COMPARATIVE STUDY OF GOOGLE FORMS AND QCM CAM

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ABSTRACT

Integrating ICTE in learning assessments brings benefits but faces challenges like limited internet access. This can hinder fair evaluations, especially in rural or developing areas. Not all learners have personal computers or internet connections, creating disparities in digital resource access. Such inequalities compromise assessment equity and impartial evaluation. Exploring alternative options is crucial for effective and accessible assessment methods.

This article presents a comparative analysis of the advantages and disadvantages/limits of Google Forms and QCM CAM tools for digitized assessment in the educational environment. The study was conducted among 14 trainee teachers of earth and life science, selected from 36 individuals undergoing training at the RCETP of Tangier during the academic year 2022/2023. The nominal group technique (NGT) was employed to achieve the study's objectives. The results indicate that the choice between QCM CAM and Google Forms for digitized assessment strongly depends on the context.

In urban environments with robust infrastructure and extensive connectivity, Google Forms are favored for their flexibility and user-friendliness. However, in rural areas facing connectivity challenges and a lack of digital devices, teachers prefer to opt for QCM CAM due to its ability to function locally, ensuring uninterrupted and equitable assessment. The study underscores the significance of considering educational and technological contexts when selecting assessment tools. Instead of a universal approach, diversified solutions are necessary to cater to specific needs. Achieving fair and effective evaluation requires a judicious adaptation of technologies, maximizing benefits while minimizing drawbacks.

In essence, the research emphasizes a thoughtful and context-driven integration of Information and Communication Technology for Education (ICTE) in educational assessment. This aids decision-makers and educators in making informed choices to enhance learning, whether in dynamic urban settings or less connected rural regions.

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INTRODUCTION

The assessment of learning is a cornerstone in the educational process, with diagnostic and formative assessments playing pivotal roles. These assessments serve as dynamic tools that go beyond merely measuring the knowledge acquired by learners. They act as diagnostic instruments, adept at identifying specific areas of strength and weakness in a student's understanding of a subject. This nuanced understanding allows educators to tailor their pedagogical methods, ensuring a targeted and effective approach to address individual learning needs (Harris, Adie & Wyatt-Smith, 2022; Baker, 2012).

In the ever-evolving landscape of education, the integration of Information and Communication Technologies for Education (ICTE) represents a significant advancement, signaling a paradigm shift in how learning is assessed. ICTE brings forth new possibilities, allowing for a more comprehensive and dynamic evaluation of student knowledge and skills. This integration is particularly beneficial for teachers, professors, and students (Ota et al., 2023), providing a diverse range of digital tools from sophisticated e-learning platforms to user-friendly applications. Commonly used tools in assessments include Google Forms and QCM Cam.

Google Forms, a part of the Google office suite, is a free and ad-free tool enabling the creation of assessments in questionnaire form, with feedback options for each participant. Users can access statistics such as the percentage of correct answers and identify challenging questions. Google Forms accommodates various question types, including short answers, paragraphs, multiple-choice, checkboxes, dropdown lists, linear scales, and multiple-selection grids (Sivakumar, 2019; Pertama Sari et al., 2020).

QCM Cam, a web-based assessment tool, allows teachers to swiftly collect real-time formative assessment data without requiring students to use devices or traditional paper and pencil methods. Designed for multiple-choice surveys, it employs a webcam and square markers provided to participants (COGEZ, 2019).

These tools offer interactive and engaging learning environments, transcending traditional assessment boundaries by enabling interactive quizzes, multimedia integration, and real-time feedback.

However, the transition to digital tools for learning assessment brings forth challenges related to accessibility, particularly with regards to the digital literacy levels of both learners and educators (Tsayem Tchoupou et al., 2023). The accessibility of these tools relies heavily on the availability of computer resources and internet access. According to the National Telecommunications Regulatory Agency in Morocco (NTRA), this remains a significant obstacle, especially in rural and developing regions (NTRA, 2017). The digital divide, exacerbated by disparities in access to personal computers and reliable internet connections, poses a significant threat to the equity of assessments.

Recognizing these challenges, it becomes imperative to explore alternative options that offer effective and accessible means of assessment. The present study aims to contribute to this exploration by undertaking a detailed comparison and evaluation of two specific alternatives – Google Forms and QCMCAM – both positioned as digitized assessment tools. This comparative analysis seeks not only to assess the efficacy of these tools but also to scrutinize their accessibility and usability in diverse educational settings.

1. METHODOLOGY

1.1. Description of the research instrument

To address the objectives of this research, we employed the Nominal Group Technique (NGT), which is a technique for collecting perceptions. Its objective is to gather opinions, attitudes, ideas, and experiences from a group of individuals on a specific question that directly concerns them (Delbecq, Van Ven, & Gustafson, 1975). The method's originators introduced it as a process for identifying strategic problems and developing innovative programs. Over time, NGT has found applications in various fields

such as education, consumer preference research, healthcare services, health promotion, criminology, and market and management research (Hugé & Mukherjee, 2018)

The steps of the Nominal Group Technique (Grenier & Lagarde, 2000 ; Mullen et al., 2021) are :

- Determine the timing, location, and list of individuals invited to participate in the session.
- Choose the nominal question.
- Individually produce statements.
- Collect and clarify ideas generated by participants.
- Conduct individual and anonymous voting.
- Analyze and present the results.

1.2. Presentation of the Participant Sample

We randomly selected 14 trainee teachers of earth and life science, comprising 7 females and 7 males, from a group of 36 teachers undergoing training at the Regional Center for Education and Training Professions (RCETP) of Tanger for the academic year 2022/2023. It is essential to note that these teachers have already had the opportunity to use Google Forms and QCM CAM (assessment tools) during their training.

In order to successfully conduct this research, we followed a series of steps, the main ones of which are as follows:

- **Grouping the Trainee Teachers**

During an afternoon in the month of May 2023, we gathered the 14 trainee teachers in a classroom at the RCETP of Tanger to explain to them the concept of the Nominal Group Technique (NGT), emphasizing that it was part of a doctoral research study.

- **Selection of the Nominal Question**

The choice of the nominal question is not arbitrary, as the Nominal Group Technique (NGT) is not always suitable for all questions posed to a group of individuals. It is particularly useful for open-ended questions that involve a perception, viewpoint, or opinion of the respondents. The question should also be precise, perfectly clear, unambiguous, and should elicit responses of equivalent level (Grenier & Lagarde, 2000). With this in mind, we selected the following question:

"What are the advantages and disadvantages/limitations of QCMCAM and Google Forms as assessment tools?"

In parallel with this nominal question, we asked the trainee teachers to determine which of these two tools they would use in an urban environment and in a rural environment.

- **Individual Statement Generation**

Once we had established a climate of trust with the 14 trainee teachers in the sample, we encouraged and motivated them to express themselves freely, without any constraints, on one of the two sheets we distributed to them.

- **Collection and Clarification of Ideas Produced by Participants**

The objective of this step is to ensure a maximum number of responses in order to create an exhaustive list of the advantages and disadvantages/limitations of QCMCAM and Google Forms as assessment tools. Data collection revealed several responses, which we recorded on the board, rephrased, and numbered for clarity. We also eliminated redundant proposals and those that appeared irrelevant, such as responses solely dependent on respondents' logic. As a result, the number of retained responses was reduced to 9 for each aspect of the nominal question.

- **Individual and Anonymous Voting**

In this step, we asked the trainee teachers to prioritize the 9 responses listed on the board by assigning a

weight of 9 to the top-ranked response, 8 to the second, and so on down to the last.

- **Analysis and Presentation of Results**

At the conclusion of the NGT session, we obtained a list of weighted and personalized statements for each participant. Next, we added up the weights received for each of the statements. For the statistical analysis of the results, we employed Microsoft Excel.

2. RESULTS AND DISCUSSION

After summing up the weights assigned to each statement, we obtained the following results:

2.1. Advantages of QCMCAM

The results regarding the advantages of QCMCAM are presented in the table below.

Table 1. Advantages of QCMCAM as Perceived by Trainee Teachers

Rank	Advantages of QCMCAM	Σpi
1	Does not require learners to have computer tools (smartphones, computers...) to respond to MCQs.	98
2	Rapid Assessment: QCM CAM allows for almost instant evaluation of learners' responses, enabling teachers to quickly obtain results and adjust their teaching accordingly.	95
3	Learner Engagement: QCM CAM can make assessment more interactive and enjoyable for learners. They can use QR codes to answer questions, which can promote active participation.	91
4	The application can function locally (without the need for internet).	78
5	implified Classroom Management: QCM CAM eases classroom management during assessments, as teachers can swiftly collect learners' responses and gain real-time insight into their understanding.	67
6	Workload Reduction: QCM CAM automates the evaluation correction process, saving teachers time by avoiding manual and tedious paper grading.	67
7	Ability to question a student who has answered correctly (or not).	52
8	Data Analysis and Detailed Reports: QCM CAM offers advanced data analysis features, such as graphs and detailed reports, enabling teachers to gain deeper insights into learners' performance and progress.	47
9	Availability of a library of MCQs.	35

According to the table above, it is evident that trainee teachers attach significant importance to specific advantages of QCMCAM.

The most significant advantage, ranking first with a weight of 98, is the fact that this tool does not require electronic devices such as smartphones or computers for learners to respond to multiple-choice questions (QCM). This can be particularly advantageous in contexts where technological resources are limited or not readily accessible. Opting for QCMCAM allows teachers to assess learners without relying on electronic devices, making assessment more inclusive and equitable for learners from various socio-economic backgrounds. This aligns perfectly with the findings of the literature review which indicate that the use of ICT can be hindered by the need for electronic devices (Buda, 2020; Haleem et al., 2022). The second advantage, with a very close weight of 95, is the rapidity of assessment. Learners' responses can be evaluated almost instantly using QR code reading technology. This is in complete accordance with the results presented in the article by Rao et al. (2020). This feature provides teachers with swift access to results, enabling them to make informed decisions regarding the adaptation of their teaching to cater to specific student needs. Learner engagement, noted with a weight of 91, is also highlighted as a major advantage of QCMCAM. The interactive and playful nature of the tool, facilitated

by the use of QR codes to answer questions, encourages learners to actively participate in assessments. This increased engagement can stimulate their motivation, interest in learning, and ultimately enhance their overall performance in assessments. Other significant advantages of QCMCAM have been identified. Firstly, with a weight of 78, local operation without internet connectivity was emphasized by the trainee teachers as a key aspect of the tool. This functionality enables teachers to use QCMCAM even in environments where Internet connectivity is limited or unavailable. In rural or remote areas where accessing the internet might be a challenge, QCMCAM offers a practical solution for conducting assessments without depending on an online connection. Thus, this advantage extends the tool's utility to diverse educational contexts, ensuring equitable assessment for all learners, regardless of their geographical location. Another key advantage of QCMCAM, noted with a weight of 67, is the simplification of classroom management during assessments. The quick collection of learner responses allows teachers to gain real-time insights into the overall class understanding, this aligns entirely with the outcomes of Rao et al. (2020). This functionality empowers teachers to make informed educational decisions, such as adjusting the pace of teaching based on learner responses or immediately revisiting certain concepts if necessary. Classroom management becomes smoother and more efficient through the automation of the response collection and processing process, allowing teachers to focus more on the specific needs of their students. Reducing workload is another significant advantage of QCMCAM, also noted with a weight of 67. Automating the assessment correction process saves teachers time by avoiding laborious manual paper grading. This reduction in administrative tasks enables teachers to concentrate more on other essential aspects of their pedagogical role, such as lesson planning, developing more effective teaching strategies, and individualized student progress monitoring. Thus, QCMCAM proves to be a valuable ally for teachers, enabling them to optimize their time and efforts in their practice. Other important points deserve attention as well. The first, noted with a weight of 52, is the ability to question a student who has answered correctly (or not). This feature is a major asset for teachers, as it allows them to better understand each learner's level of comprehension. By directly questioning a student who has given a correct response, teachers can positively reinforce their effort and performance, encouraging them to continue performing well. Similarly, by questioning a student who has answered incorrectly, teachers can identify specific gaps and provide targeted feedback to help the learner progress. This possibility of individual questioning promotes personalized monitoring and closer communication between the teacher and learners. The second significant aspect is data analysis and detailed reports, with a weight of 47. QCMCAM offers advanced data analysis features, such as graphs and detailed reports, enabling teachers to gain in-depth insights into learners' performance and progress. These analysis tools help teachers identify strengths and weaknesses in each learner, as well as general class trends. With this knowledge, teachers can adjust their teaching based on specific student needs and adapt their pedagogical approach to enhance learning. Moreover, the data collected by QCMCAM can be used to evaluate the effectiveness of pedagogical strategies and guide future decisions in curriculum planning and development. Lastly, the availability of a library of multiple-choice questions (QCM), noted with a weight of 35, is an additional advantage that facilitates assessment creation. Access to a variety of pre-defined multiple-choice questions saves teachers time in assessment preparation. This library offers a reliable source of quality questions, covering different learning areas and levels of difficulty, allowing teachers to compose balanced and consistent assessments.

2.2. Disadvantages/Limitations of QCMCAM

The responses of the trainee teachers regarding the disadvantages/Limitations of QCMCAM are presented in the table below:

Table 2. Disadvantages and Limitations of QCMCAM as Perceived by Trainee Teachers

Rank	Disadvantages/Limitations of QCMCAM	Σpi
1	Limitation of Question Types: QCMCAM is primarily designed for multiple-choice questions, which can limit the ability to assess more complex skills or in-depth knowledge that require open-ended responses.	88
2	Technical Difficulties: Technical issues such as Internet connectivity problems, device failures, or software bugs can lead to disruptions in the assessment process and create frustrations for both learners and teachers.	87
3	No Storage on Server: QCMCAM does not store anything on its server.	74
4	Risk of Cheating: There is a risk of cheating, as learners may share their answers or use external resources during the assessment.	72
5	In-Person Requirement: QCMCAM assessments need to be conducted in person (responses need to be scanned), which could present logistical challenges.	70
6	Technology Dependency: QCMCAM requires technological devices (computers, tablets, smartphones, etc.), which can be a barrier in contexts where technological resources are limited or unavailable.	67
7	Difficulty in Collaborative Work: Collaborative creation of assessments among teachers can be difficult with QCMCAM.	66
8	Close Proximity for Scanning: Scanning of responses requires close proximity to the markers.	53
9	Camera Requirement: QCMCAM requires a camera on a computer, phone, or tablet for scanning QR codes.	53

The first significant disadvantage, noted with a weight of 88, is the limitation of question types. QCMCAM is primarily designed for multiple-choice questions, which can limit the ability to assess more complex skills or in-depth knowledge that require open-ended responses. Indeed, certain subjects or pedagogical skills require more open-ended questions that allow learners to demonstrate their critical thinking, creativity, and problem-solving abilities. In such cases, QCMCAM may not be the most suitable tool to assess these more qualitative aspects of learning, this is entirely consistent with the outcomes or findings of Couch et al. (2018). The second disadvantage, noted with a very close weight of 87, concerns technical difficulties. Internet connectivity issues, device failures, or software bugs can lead to interruptions in the assessment process. This can create frustrations for both learners and teachers, resulting in assessment delays and a degradation of the overall learning experience. Technological constraints can therefore be a barrier to smooth and effective use of QCMCAM in certain contexts. Another disadvantage noted with a weight of 74 is that QCMCAM does not store anything on its server. While this may be considered an advantage in terms of privacy protection and data security, it can also have drawbacks. Not storing results on a centralized server can make it more difficult to centralize data for deeper analysis or to track learners' performance over the long term. The risk of cheating is also a disadvantage highlighted by the trainee teachers, noted with a weight of 72. Since learners can share their answers or use external resources during the assessment, ensuring the

integrity and validity of the results can be more challenging. This underscores the importance of maintaining a controlled testing environment and implementing measures to prevent cheating, which is entirely consistent with the findings of Koçdar et al. (2018). Additionally, there are several other limitations mentioned by the trainee teachers, such as the requirement for in-person scanning of responses (weight 66), difficulties in collaborative work among teachers for assessment creation (weight 59), dependence on technology and potential barriers in resource-limited contexts (weight 58), the need for close proximity for scanning (weight 55), and the requirement for a camera on a device for scanning QR codes (weight 51). These limitations and drawbacks of QCMCAM underscore the need for educators to carefully consider the specific assessment goals, learning outcomes, and technological context before deciding to use QCMCAM or any other assessment tool. It's important to choose the tool that best aligns with the desired educational objectives and provides a balanced approach to assessing various types of knowledge and skills. However, it should be noted that the creators of QCMCAM have assigned different QR codes for each student and have used a distinct color for the responses to make cheating more challenging (see Figure1). This design element aims to enhance the integrity of the assessment process by minimizing the risk of unauthorized sharing of answers or external resource usage.

Figure 1. Examples of markers distributed to students

Another point noted with a weight of 70 is that QCMCAM is conducted in person, meaning that students' responses need to be scanned by the teacher. While this can be convenient in certain cases, it can be cumbersome for teachers who need to manually scan a large number of responses, which can be time-consuming, especially during assessments involving a significant number of students. The difficulty of collaborative work among teachers to create assessments is also highlighted with a weight of 66. Due to the specific nature of QCMCAM and its use of QR codes, it can be more challenging for teachers to collaborate and share resources to create common assessments. This can limit the possibility of standardizing assessments within the same pedagogical context. Another disadvantage noted with a weight of 67 is the technology dependency for teachers. The use of QCMCAM requires technological devices such as computers, tablets, or smartphones. In contexts where technological resources are limited or unavailable, this can be a barrier to optimal tool usage. Furthermore, the need to be in close proximity to markers for scanning, noted with a weight of 53, can be restrictive for teachers who have to physically move to scan students' responses. This can be particularly challenging in larger classrooms. Finally, also noted with a weight of 53, QCMCAM requires a camera on the computer or on the phone/tablet to scan QR code markers. This can be a limitation in cases where teachers do not have access to a functional camera or when the device being used does not support this functionality. These drawbacks emphasize the importance of considering the practical implications of using QCMCAM, especially in terms of the logistical challenges and technological requirements it may pose for educators. While QCMCAM offers valuable features, these limitations need to be carefully weighed against its benefits when making decisions about its implementation in educational settings.

2.3. Advantages of Google Forms

The advantages of Google Forms, as perceived by the trainee teachers, are as follows:

Table 3. Advantages of Google Forms as Perceived by Trainee Teachers

Rank	Advantages of Google Forms	Σpi
1	Flexibility of Response: Google Forms offers a variety of question types, such as multiple-choice questions, short answer questions, checkboxes, rating scales, etc. This allows teachers to assess students' skills in different ways.	107
2	Ease of Use: Google Forms is user-friendly and easy for both teachers and students to navigate.	92
3	Automatic Data Collection: Student responses are automatically collected and recorded in a Google Sheets spreadsheet, facilitating easy tracking and subsequent analysis of results.	79
4	Instant Feedback: Teachers can set up automatic responses to provide instant feedback to students after they submit their forms, which can enhance learning and reflection.	74
5	Multimedia Integration: Google Forms allows the integration of multimedia elements such as videos, images, or links to online resources, making questions more interactive and engaging.	70
6	Accessibility: Students can access Google Forms from any device with an internet connection, enabling them to submit their responses from anywhere.	66
7	Time Saving: Google Forms saves time by automating data collection and organization, as well as providing features like form duplication for future assessments.	55
8	Real-time Collaboration: Multiple teachers can collaborate on the same form, facilitating the sharing of resources and ideas to create more comprehensive assessments.	47
9	Progress Tracking: Through the response tracking feature, teachers can monitor individual student progress over time, leading to a better understanding of their needs and areas for improvement.	40

The results clearly show that the trainee teachers recognize and appreciate various advantages offered by Google Forms as an assessment tool. The weight assigned to each advantage reflects their perceived significance in the context of teaching and evaluation.

The first major advantage, noted with a weight of 107, is the flexibility of response offered by Google Forms. The variety of question types available allows teachers to design assessments tailored to specific learning objectives and subjects taught. This adaptability enhances the relevance and accuracy of assessments, providing a more comprehensive and holistic assessment approach. Ease of use, noted with a weight of 92, is also a crucial asset. Google Forms' user-friendly and intuitive interface not only simplifies the creation of assessments but also ensures a seamless experience for both teachers and students. This ease of use helps optimize time and effort invested in assessment creation and administration. Automatic data collection, noted with a weight of 79, is another significant advantage. Student responses are automatically recorded in a Google Sheets spreadsheet, making compilation, tracking, and analysis of results easier. This functionality streamlines administrative processes for teachers while providing greater visibility into student performance. Instant feedback, noted with a weight of 74, contributes to active and reflective learning. Teachers can provide immediate feedback to students after submitting their forms, helping students understand their mistakes and progress. This

real-time feedback promotes ongoing engagement and continuous improvement. Multimedia integration, noted with a weight of 70, enriches the assessment experience by allowing the addition of videos, images, and links to online resources. This makes questions more interactive and engaging for students, potentially enhancing their interest and participation. Accessibility, noted with a weight of 66, is an important aspect of Google Forms. Students can access the form from various devices, promoting equitable participation and facilitating response submission regardless of location. Time savings, noted with a weight of 55, is a particularly appreciated advantage by teachers. Automation of data collection and organization, along with the ability to duplicate forms, optimize the preparation and administration of assessments. Real-time collaboration, noted with a weight of 47, opens opportunities for collaborative work among teachers. This feature facilitates the sharing of resources and ideas, thereby promoting the creation of richer and more diverse assessments. Finally, the progress tracking feature, noted with a weight of 40, is highlighted as an asset. Teachers can monitor individual student progress over time, enhancing their understanding of individual needs and contributing to targeted instructional adaptation.

2.4. Disadvantages/Limitations of Google Forms

The responses of the trainee teachers regarding the disadvantages/Limitations of Google Forms are presented in the table below:

Table 4. Disadvantages and Limitations of Google Forms as Perceived by Trainee Teachers

Rank	Disadvantages/Limitations of Google Forms	Σpi
1	Constraints of Internet Connectivity: The use of Google Forms requires a stable internet connection, which can be problematic in regions with limited or unstable internet access.	115
2	Lack of Real-time Monitoring: Google Forms does not allow real-time monitoring of students as they complete the form, potentially leading to cheating or a lack of verification of response authenticity.	91
3	Risk of Cheating: Since students can access Google Forms from their own devices, there is an increased risk of cheating by using external resources during the assessment.	86
4	Difficulty in Subjective Grading: Google Forms is better suited for objective grading, such as multiple-choice or short-answer questions. It can be more challenging to evaluate more subjective work, like essays or artistic projects, using this tool.	85
5	Need for Technological Skills: Both teachers and students need a certain level of proficiency with digital tools and the Google Forms platform to use it effectively, which can be a challenge for users less familiar with technology.	56
6	Complexity for Younger Students: Learners, especially younger ones, may encounter difficulties navigating and responding accurately to questions on Google Forms, especially if they are not familiar with the tool.	53
7	Difficulty in Assessing Critical Thinking: Google Forms may struggle to assess critical thinking skills, which often require in-depth analysis, argumentation, or decision-making.	52
8	Limitation of Feedback: While Google Forms can provide automated feedback for responses, giving personalized and detailed feedback to students, especially for more complex assignments, can be challenging.	52
9	Risk of Data Loss: Although student responses are automatically saved, there is still a risk of data loss due to technical issues or computer glitches.	40

According to the result, the foremost major disadvantage is related to Internet connectivity constraints, marked with a weight of 115. This dependency on a stable internet connection can

present a significant obstacle in regions where internet access is limited or unstable. In such contexts, using Google Forms could be complicated or even impossible, making it challenging to collect student responses and assess their performances. Another significant drawback is the lack of real-time monitoring, indicated with a weight of 91. The fact that Google Forms does not allow real-time monitoring of students as they fill out the form could raise concerns about the validity of responses. Without direct supervision, there is an increased possibility of cheating or providing inauthentic answers, which could compromise the reliability of assessment results obtained. The difficulty in subjective grading, noted with a weight of 85, also constitutes a significant disadvantage for Google Forms. The tool is better suited for objective grading, such as multiple-choice or short-answer questions. However, for more subjective assignments or those requiring more in-depth evaluation, Google Forms might be less suitable, limiting the opportunities for comprehensive assessment of students' skills in certain areas. The need for technological skills, marked with a weight of 56, is another consideration. To effectively use Google Forms, both teachers and students need a certain level of proficiency with digital tools and the platform. For those who are not familiar with technology or lack a good understanding of the tool, this could pose a challenge for optimal use of Google Forms in an educational context. The complexity for younger students, indicated with a weight of 53, is a specific drawback associated with Google Forms. Younger learners might encounter difficulties navigating the interface and responding accurately to questions, especially if they are not familiar with the tool. This additional challenge could impact the accuracy and reliability of student responses, warranting special attention when using Google Forms in classrooms with younger students. Difficulty in assessing critical thinking, marked with a weight of 52, is another drawback mentioned for Google Forms. Critical thinking skills, which often require in-depth analysis, argumentation, or decision-making, might be harder to assess through this tool. This limitation could be a concern for teachers seeking to thoroughly assess students' analytical and critical abilities. The limitation of feedback, indicated with a weight of 52, is also a concern reported by student teachers. While Google Forms can provide automated feedback for responses, giving personalized and detailed feedback to students, especially for more complex assignments, can be challenging. This might restrict teachers' ability to provide specific feedback to students and help them progress in their learning. Lastly, the risk of data loss, marked with a weight of 40, is a drawback mentioned for Google Forms. Although student responses are automatically saved, there is always a risk of data loss due to technical issues or computer glitches. It's crucial for teachers to take measures to regularly back up data to prevent accidental loss of important information.

2.5. Preference order for using these applications in learning assessment

The obtained results highlight distinct preferences based on urban and rural contexts regarding the use of Google Forms and QCMCAM for learning assessment (Table 5).

Table 5. Preferences for Learning Assessment Tools in Urban and Rural Contexts: Google Forms vs. QCMCAM

	Google Forms	**QCM CAM**
Urbain environment	100%	0%
Rural Environment	0%	100%

In an urban environment, where technological infrastructure is generally more developed, trainee teachers appear to prioritize Google Forms as their first choice for assessment. Several factors may contribute to this trend. Firstly, the flexibility of

response offered by Google Forms caters to the diversified assessment needs in an urban setting where technological resources and internet connectivity are more accessible. Additionally, the user-friendliness of Google Forms is likely a significant advantage in an environment where both teachers and learners are more familiar with digital technologies.

On the other hand, the results show that in a rural context, trainee teachers prefer QCM CAM as their top choice. This reflects an important consideration: QCM CAM's ability to function locally without requiring internet connectivity. In rural areas where connectivity might be a challenge (NTRA, 2017), this feature becomes a major asset, ensuring that assessment can take place without interruptions. Furthermore, the use of QR code markers with QCM CAM can potentially alleviate technological barriers, allowing learners to use their own devices to respond to questions.

These findings underscore the importance of considering the specific context when choosing digital assessment tools. Trainee teachers recognize that different solutions may be necessary depending on available technological resources and connectivity. This awareness is crucial to ensure fair and effective assessment of learners, whether they are in urban or rural settings. Ultimately, it's about adapting technologies to the educational context to maximize benefits and minimize drawbacks.

CONCLUSION

The rapid evolution of digital technologies has profoundly transformed the education landscape, offering new opportunities and challenges for learning assessment. This article has delved into the advantages, disadvantages, and preferences of trainee teachers regarding digital assessment tools, focusing on Google Forms and QCM CAM.

The results of our survey have clearly highlighted the strengths of Google Forms in the assessment process. Its flexibility in designing diverse questions, user-friendly interface, and automatic data collection have made it an attractive choice for many teachers. The potential for multimedia integration and the ability to provide instant feedback have also been praised as contributing elements to the effectiveness of this tool. However, considerations related to internet connectivity, real-time monitoring, and the complexity of evaluating subjective skills have been identified as important limitations.

In a world where access to technology varies significantly, it is essential to consider the context in which these tools are used. The preferences of trainee teachers differ depending on whether they are in an urban or rural environment. In urban areas where connectivity is stronger, Google Forms was favored due to its versatility and ease of use. Conversely, in rural regions facing connectivity challenges, QCM CAM was preferred for its ability to function locally and compatibility with various devices.

Ultimately, this article underscores the importance of adaptability and contextual relevance in the choice of digital assessment tools. Today's teachers play a crucial role in evolving assessment practices, intelligently integrating the benefits of technology while remaining aware of its limitations. The effectiveness of assessment relies on a balanced approach that values both technology and pedagogy, placing the needs and contexts of learners at the center of the assessment process.

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