

Grading efficiency and accuracy: Teachers' ZipGrade app experiences

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ABSTRACT

This study examined the experiences of teacher respondents in using the ZipGrade application at Nagpayong High School (Junior High School level) during School Year 2022–2023. The study used a descriptive research design employing a survey method. Data were analyzed using the weighted mean to determine teachers' perceptions of the application's efficiency, accuracy, and challenges in assessment practices. The results showed that teachers strongly agreed that the ZipGrade application significantly improved grading efficiency. In terms of accuracy, the application was perceived to provide reliable results in checking students' tests and examinations. Additionally, teacher respondents reported only minimal challenges and limitations in using the application. Overall, the findings suggest that ZipGrade is an effective and practical technology-assisted assessment tool for supporting efficient and accurate grading practices in secondary education.

INTRODUCTION

Advancements in technology have paved the way for tools and applications that significantly streamline the assessment process in education. As educational systems increasingly emphasize data-driven instruction and accountability, assessment practices have likewise evolved to incorporate digital solutions that promote efficiency, accuracy, and instructional responsiveness (Anastasopoulou et al., 2024; Okafor, 2025; Singh & Singh, 2025). Garcia et al. (2023) emphasized the importance of understanding teachers' perceptions of technology integration in teaching, noting that teachers' beliefs, confidence levels, and perceived usefulness of digital tools play a critical role in successful classroom adoption. Without addressing teachers' concerns and readiness, even well-designed educational technologies may fail to achieve their intended impact (Antonietti et al., 2022; Ventouris et al., 2021). Without addressing teachers' concerns and readiness, even well-designed

educational technologies may fail to achieve their intended impact.

In line with this perspective, the present study examines the use of a technological tool designed to streamline the assessment process, particularly the grading of tests and examinations. One assessment tool that has gained increasing popularity among educators is ZipGrade, an automated grading application that utilizes optical mark recognition (OMR) technology to scan, score, and analyze multiple-choice assessments. Technology-based grading tools such as ZipGrade aim to reduce the manual burden associated with checking examinations while minimizing human error. This study focuses on teachers' experiences with ZipGrade, specifically in terms of its accuracy and efficiency in grading assessments, two critical criteria that influence teachers' acceptance and sustained use of assessment technologies.

Accurate assessment of student performance is essential, as it contributes to positive learning experiences and ultimately leads to academic success (Neumann et al., 2019). Assessment accuracy ensures that students' scores genuinely reflect their level of understanding and mastery of learning outcomes, which in turn informs instructional decisions, remediation strategies, and feedback mechanisms (Kantisa Sirianansopa, 2024; Mesny et al., 2026). Among the various components of student performance, tests and examinations remain among the most widely used and influential forms of assessment in formal education (Murphy et al., 2023; Schildkamp et al., 2020; Zaabalawi & Jawad Zaabalawi, 2024). Consequently, ensuring efficiency and accuracy in grading these assessments is a critical professional responsibility of teachers. Errors or delays in grading can undermine the credibility of assessment results and negatively affect students' motivation and learning progression.

Another essential aspect of student assessment is the provision of timely feedback, which has consistently been identified as a challenge in traditional, paper-based grading practices (Fisher et al., 2025; Mesny et al., 2025). Delayed feedback may reduce its

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instructional value and limit students' ability to reflect on and improve their performance. The integration of technology in assessment has been shown to help address this issue by accelerating scoring and facilitating immediate access to results. As noted by Nistal-Llamas et al. (2013), technology-assisted assessment tools provide teachers with technical support in test creation, analysis of student responses, and automated scoring and reporting. These functions not only enhance grading efficiency but also support instructional decision-making by allowing teachers to identify learning gaps and trends more quickly.

Several studies further support the value of digital assessment tools in contemporary classrooms. Palanas et al. (2019) investigated the use of digital assessment tools and found that schools often failed to fully utilize technology in student assessment due to three primary reasons: (1) restrictive division-level standards, (2) teachers' concerns about potential digital errors, and (3) administrators' preference for traditional assessment practices. These findings highlight that institutional policies and attitudes can significantly influence the adoption of assessment technologies. The authors emphasized the necessity for teachers to adapt to emerging technologies, particularly software applications that can support both assessment and instruction in increasingly complex learning environments. Similarly, Estarez et al. (2023) concluded that the use of the ZipGrade application as an assessment tool yielded several positive effects, enabling teachers and learners to develop a better understanding of the tool while significantly reducing teachers' workload in evaluating students' outputs. Their findings suggest that repeated use and familiarity with the application improve both user confidence and perceived usefulness. In addition, Ningsih and Mulyono (2019) reported that teachers perceived technology-based assessment tools as beneficial in creating more engaging and enjoyable learning environments, as well as in facilitating faster scoring and more timely feedback for students. These positive perceptions are crucial, as teachers' acceptance of assessment technologies directly affects their integration into daily instructional practice.

Checking and grading students' assessments often require a substantial amount of teachers' time, particularly in large classes where multiple sections and repeated assessments are involved. With the integration of technology, however, teachers are now able to assess tests and examinations more efficiently, thereby freeing time that can be devoted to actual teaching and other instructional responsibilities (Lin, 2018). This positions technology as a crucial component of the assessment process, as it enables teachers to allocate more time to essential tasks such as individualized instruction, lesson refinement, and engagement in professional development activities. Moreover, the reduced time required for grading through the use of technology allows teachers to devote greater attention to instructional planning, which is vital for maintaining high instructional standards and improving student outcomes (Haleem et al., 2022; Malinao & Miano, 2025; Sharma & Singh, 2023).

Despite these documented benefits, the successful implementation of technology-assisted assessment tools is not without challenges. Teachers may encounter issues related to technical proficiency, device compatibility, scanning accuracy, data storage, and application usability. Understanding these challenges is essential to ensuring that digital tools are not only efficient but also practical and sustainable in real classroom contexts. Given these considerations, it is imperative to examine teachers' experiences and levels of satisfaction in using the ZipGrade application, as well as the challenges they encounter

during its implementation. Gathering systematic feedback from teacher-users ensures that the application aligns with instructional needs and preferences, making it applicable not only to the assessment of student performance but also to broader educational contexts.

This study aimed to examine teachers' first-hand experiences in using the ZipGrade application for grading students' tests and examinations, with particular focus on efficiency, accuracy, and encountered challenges. Specifically, it sought to determine how ZipGrade improves grading efficiency in terms of time savings, reduced administrative workload, and overall grading effectiveness, as well as how it ensures accuracy through proper interpretation of students' responses and management of potential errors. The study also explored challenges related to technical proficiency, device compatibility, user interface, scanning accuracy, and data management. By gathering teachers' feedback and recommendations, this research contributes to the growing literature on technology-assisted assessment and provides insights that may enhance teaching effectiveness, improve assessment practices, and ultimately support better student learning outcomes.

MATERIALS AND METHODS

Participants

The participants in this study were teachers who used the ZipGrade application from Nagpayong High School (Junior High School level) located in Pinagbuhatan, Pasig City, Philippines. The respondents represented the subject areas of Science, Edukasyon sa Pagpapakatao (EsP), and Technology and Livelihood Education (TLE). Specifically, the sample included 15 Science teachers, 7 EsP teachers, and 24 TLE teachers, for a total of 46 respondents, of whom 42 were female and 4 were male. Among these respondents, only three teachers had paid subscriptions to the ZipGrade application. All eligible teachers within the identified subject specializations who were using the ZipGrade app were invited and included in the study, and no eligible teachers declined to participate.

A purposive sampling technique under the broader category of non-probability sampling was employed, because actual use of the ZipGrade application was required for participation. According to Nikolopoulou (2022), non-probability sampling involves selecting participants based on non-random criteria such as availability, geographic proximity, or specific expertise relevant to the research question. Purposive sampling, in particular, refers to selecting participants because they possess characteristics essential to the study (Nikolopoulou, 2022). No sample size computation was conducted, as the study included the entire accessible population of teachers within the specified specializations who met the inclusion criteria.

Although the study adopted a quantitative research approach, which commonly employs probability sampling, the use of non-probability sampling was justified due to the specific qualifications required of the respondents. However, it is acknowledged that this sampling approach may introduce potential selection bias, as the participants consisted only of teachers who were already using the ZipGrade application and may therefore be more technologically inclined than the general teaching population. Teachers who are less familiar or less comfortable with educational technology were not represented in the sample, which may limit the generalizability of the findings. Nevertheless, this approach was considered acceptable, as Laerd Dissertation (2023) noted that non-

probability sampling is a valid technique in qualitative, mixed-methods, and even quantitative research designs.

The study utilized a quantitative descriptive research design, focusing on numerical data relevant to the investigation. Quantitative research involves the systematic empirical study of phenomena using statistical, mathematical, or computational techniques. Specifically, the descriptive method was employed to identify characteristics of the observed phenomenon and to describe conditions as they exist, without manipulation of variables (Leedy & Ormrod, 2014).

Methods

The study employed a quantitative research approach to analyze numerical data gathered from teachers' responses regarding their experiences using the ZipGrade application for grading assessments. Quantitative data were obtained through a structured questionnaire and were used to determine the levels of grading efficiency, accuracy, and challenges associated with the use of the application.

Specifically, the study used the descriptive method to summarize the respondents' perceptions based on their computed mean scores. The method allowed the researchers to examine the current status and actual experiences of teachers in using the ZipGrade application without manipulating any variables. Consistent with the descriptive approach, the study focused on presenting the results as they naturally occurred in the school setting, providing a clear picture of how ZipGrade was used in assessment practices (Leedy & Ormrod, 2014).

Instrument

A researcher-made instrument was used in this study and underwent content and face validation prior to its administration. The instrument was evaluated by three experts in the field of education, consisting of a senior secondary school administrator, a licensed teacher with extensive experience in classroom assessment, and a research expert with specialization in educational measurement and evaluation. These validators assessed the instrument in terms of clarity, relevance, appropriateness of items, and alignment with the objectives of the study. Revisions were made based on their comments and recommendations to improve item wording and ensure content adequacy.

To establish the reliability of the instrument, a pilot test was conducted among teachers who were not included in the final sample of the study. The responses obtained from the pilot testing were subjected to reliability analysis using Cronbach's alpha. The computed reliability coefficients indicated acceptable to high internal consistency across the different parts of the instrument ($\alpha \geq 0.70$), confirming its suitability for data collection.

The final instrument consisted of four parts. The first part focused on the respondents' demographic profile. The second part examined the extent to which the ZipGrade application improved grading efficiency, covering three key areas with five items each. The third part measured the accuracy of grading facilitated by the ZipGrade application, consisting of two key areas with five items each. The fourth part addressed the challenges and limitations encountered by teachers in using the ZipGrade application, comprising five key areas with five items each. All items employed a Likert-type scale to determine the level of agreement of the respondents.

Written permission to conduct the study was secured from the principal of Nagpayong High School through the respective department heads. Similarly, a letter was sent to the respondents to formally request their participation in the study. Upon approval of all required documents, the researchers initiated the data-gathering process by orienting the respondents about the instrument. Following the orientation, the questionnaires were distributed, and the researchers waited for the respondents to return the completed instruments. The retrieved questionnaires were then prepared for data analysis.

Data Analysis

Since the study employed a quantitative approach, statistical tools were used to analyze the data. Specifically, the weighted mean was used to analyze the responses obtained from Parts II to IV of the instruments. The instrument used a 4-point Likert scale. All statistical treatments were descriptive in nature and were computed using Microsoft Excel.

RESULTS AND DISCUSSION

Ways the ZipGrade App Helps Teachers Improve Grading Efficiency

Table 1: Time Saving Experience

Criteria	Weighted Mean	Adjectival Rating
1. Using ZipGrade App allows me to check students' assessments faster and more efficiently.	3.98	SA
2. ZipGrade App helps me to minimize time wasted on unnecessary tasks relative to checking students' assessments.	3.98	SA
3. ZipGrade App can simplify complex tasks in checking students' assessments thereby saving me time and using it for other grading related activities.	3.98	SA
4. ZipGrade App helps me stay organized and be on the right track on checking students' assessment.	3.96	SA
5. Using ZipGrade App has positively impacted my overall productivity in terms of grading related activities.	3.96	SA
Overall	3.97	SA

Legend: SA- Strongly Agree, A- Agree, DA-Disagree, SDA- Strongly Disagree

Table 1 presents the teachers' assessment of their time-saving experiences when using the ZipGrade application to grade students' assessments. The results show a consistently high level of agreement across all indicators, with weighted means

ranging from 3.96 to 3.98 and an overall weighted mean of 3.97, interpreted as Strongly Agree. These findings indicate that teachers perceived ZipGrade as highly effective in speeding up the checking of assessments, minimizing time spent on

unnecessary grading tasks, simplifying complex checking procedures, and improving organization and productivity in grading-related activities.

The uniformly high weighted mean scores strongly support the need for administrative support in the continued and expanded use of technology-based assessment tools. Since teachers experience significant gains in efficiency and time management, school administrators play a crucial role in sustaining these benefits by providing institutional backing such as access to compatible devices, stable internet connectivity, training sessions, and, where possible, institutional subscriptions. Administrative support ensures that

the efficiency gains observed in this study are not limited to individual initiative but are embedded within school-level assessment practices.

While the ratings reflect strong agreement, they also imply the need for structured guidance on optimal app use, such as standard scanning procedures, proper test sheet preparation, and efficient data handling. These findings align with Estarez et al. (2023), who reported that teachers perceived ZipGrade as instrumental in enabling faster scoring and more timely feedback, reinforcing the value of institutional support and guided implementation.

Table 2: Reducing Administrative Burdens

Criteria	Weighted Mean	Adjectival Rating
1. The ZipGrade app allows for efficient organization and management of graded papers.	3.96	SA
2. The ZipGrade app has made administrative tasks related to checking students' assessments more manageable.	3.96	SA
3. The ZipGrade app has reduced the need for manual checking of students' assessments.	3.93	SA
4. Because of the reduced time in checking students' assessments using the ZipGrade App, I can start other grading-related activities at an earlier time.	3.89	SA
5. The use of the ZipGrade app has streamlined the checking of students' assessment processes and workflows.	3.91	SA
Overall	3.93	SA

Legend: SA- Strongly Agree, A- Agree, DA-Disagree, SDA- Strongly Disagree

Table 2 presents the teachers' assessment of the ZipGrade application in reducing administrative burdens associated with grading students' assessments. The results indicate consistently high levels of agreement across all indicators, with weighted means ranging from 3.89 to 3.96 and an overall weighted mean of 3.93, interpreted as Strongly Agree. These findings suggest that teachers perceived ZipGrade as effective in organizing grading records, making administrative tasks more manageable, reducing the need for manual checking, and streamlining grading workflows.

The high weighted mean scores underscore the need for administrative support in institutionalizing the use of technology-based assessment tools. Since teachers reported that ZipGrade significantly reduced clerical workload and allows them to begin other grading-related tasks earlier, school administrators are positioned to maximize these benefits by

providing adequate logistical support, such as standardized assessment templates, device availability, and access to digital record-keeping systems. Administrative endorsement of such tools can further reduce redundant paperwork and align grading practices with more efficient, school-wide systems.

While teachers strongly agreed that ZipGrade reduced manual checking, the slightly lower weighted mean for initiating other grading tasks earlier (WM = 3.89) suggests the need for clearer procedural guidance on integrating the app into existing assessment routines. These findings are consistent with Nistal-Llamas et al. (2013), who emphasized that technology-assisted assessment tools provide technical support for test creation, automatic scoring, and reporting, thereby reducing teachers' administrative workload.

Table 3: Improved Grading Efficiency

Criteria	Weighted Mean	Adjectival Rating
1. Using the ZipGrade app has improved the speed and efficiency of grading my students' assessments.	3.91	SA
2. Using the ZipGrade app has made it easier to provide feedback and comments on student assessments.	3.96	SA
3. Using the ZipGrade app has been helpful in resolving any issues related to checking my students' assessments and grading them as a whole.	3.89	SA
4. The use of the ZipGrade app has reduced manual effort of checking students' assessments and increased my grading efficiency.	3.98	SA
5. The ZipGrade app has improved the overall grading experience.	3.87	SA
Overall	3.92	SA

Legend: SA- Strongly Agree, A- Agree, DA-Disagree, SDA- Strongly Disagree

Table 3 presents the teachers' assessment of the ZipGrade application in improving overall grading efficiency. The results show consistently high agreement across all indicators, with weighted means ranging from 3.87 to 3.98 and an overall

weighted mean of 3.92, interpreted as Strongly Agree. These findings indicate that teachers perceived ZipGrade as effective in increasing the speed and efficiency of grading, reducing

manual effort, facilitating the provision of feedback, and improving the overall grading experience.

The consistently high weighted mean values highlight the importance of administrative support in sustaining improved grading efficiency. As teachers reported reduced manual effort and faster feedback delivery, administrative backing, such as provision of standardized answer sheets, institutional access to the application, and structured training becomes essential to ensure that efficiency gains are maintained across subjects and grade levels. Without administrative support, the benefits

observed may remain limited to individual users rather than being fully integrated into school-wide assessment practices. Although all indicators were rated “Strongly Agree,” slightly lower weighted means for resolving grading issues (WM = 3.89) and overall grading experience (WM = 3.87) suggest a need for clearer procedural guidance when handling discrepancies, interpreting scan results, and managing feedback workflows.

Extent to Which the ZipGrade App Ensures Accurate Grading of Assessments

Table 4: Interpreting Students’ Responses

Criteria	Weighted Mean	Adjectival Rating
1. In terms of assessment, the ZipGrade app gives clear and thorough results for student responses.	3.85	GE
2. I can effectively recognize patterns or trends in student responses using the ZipGrade app.	3.89	GE
3. The ZipGrade app assists me in identifying areas where students need further assistance or explanation.	3.93	GE
4. Based on their responses, the ZipGrade app allows me to provide targeted and individualized feedback to students.	3.80	GE
5. The ZipGrade app allows me to track student progress and improvement over time by analyzing their responses.	3.91	GE
Overall	3.88	GE

Legend: GE-Great Extent, LGE- Large Extent, LLE- Little Extent, NE-No Extent

The results show that teachers perceived the ZipGrade application as effective in interpreting students’ responses to a great extent, with item weighted means ranging from 3.80 to 3.93 and an overall weighted mean of 3.88. Higher ratings were observed in the application’s ability to help teachers identify areas where students need further assistance (WM = 3.93) and recognize patterns or trends in student responses (WM = 3.89). These findings indicate that the application supports teachers in analyzing assessment data and monitoring student progress over time (WM = 3.91), thereby informing instructional decisions.

However, the relatively lower weighted mean for providing targeted and individualized feedback (WM = 3.80) suggests that while the application effectively generates assessment data, teachers may still require additional guidance in translating these results into actionable feedback. This underscores the importance of administrative support through professional development, data interpretation training, and standardized feedback practices to ensure consistent and effective use of assessment outputs.

Table 5: Handling Potential Errors and Discrepancies

Criteria	Weighted Mean	Adjectival Rating
1. I can make use of the ZipGrade app to rapidly recognize and address any problems or discrepancies in student responses.	3.91	GE
2. The ZipGrade app helps me identify common types of errors or discrepancies made by students.	3.85	GE
3. The ZipGrade app helps me address potential errors or discrepancies in a timely manner.	3.87	GE
4. The ZipGrade app helps me in successfully resolving any disputed or ambiguous student responses.	3.85	GE
5. The ZipGrade app supports me in identifying any potential errors or discrepancies in answer keys or grading rubrics.	3.87	GE
Overall	3.87	GE

Legend: GE-Great Extent, LGE- Large Extent, LLE- Little Extent, NE-No Extent

The findings indicate that teachers perceived the ZipGrade application as effective in handling potential errors and discrepancies in students’ responses to a great extent, with weighted mean values ranging from 3.85 to 3.91 and an overall weighted mean of 3.87. Teachers reported that the application enabled them to rapidly recognize and address discrepancies in student responses (WM = 3.91), identify common types of errors committed by students (WM = 3.85), and resolve

ambiguous or disputed responses (WM = 3.85). The application also supported timely correction of errors (WM = 3.87) and assisted in identifying inconsistencies in answer keys or grading rubrics (WM = 3.87).

These results emphasize the need for continued administrative support to ensure accurate and consistent assessment practices. Institutional support in the form of training on error review

procedures, calibration of answer keys, and standardized protocols for resolving discrepancies can further strengthen teachers' confidence in using the application for high-stakes assessments. These findings are consistent with Estarez et al. (2023), who reported that ZipGrade supports timely grading and effective resolution of assessment issues, and with Kenyon

(2019), who emphasized that timely resolution of assessment errors is critical to supporting meaningful learning outcomes.

Challenges and Limitations Experienced by Teachers in Using the ZipGrade App for Grading Assessments

Table 6: Technical Proficiency

Criteria	Weighted Mean	Adjectival Rating
1. I can easily navigate the ZipGrade app's features and functions.	3.46	SA
2. I can easily understand and utilize the ZipGrade app's advanced settings or customization options.	3.41	SA
3. I can easily set up and configure the ZipGrade app for my specific needs.	3.43	SA
4. While using the ZipGrade app, I find it easy to troubleshoot and handle technical problems on my own.	3.39	SA
5. It's easy for me to keep up with the latest ZipGrade app upgrades or versions.	3.35	SA
Overall	3.41	SA

Legend: GE-Great Extent, LGE- Large Extent, LLE- Little Extent, NE-No Extent

The results indicate that teachers generally perceived themselves as technically proficient in using the ZipGrade application, with weighted mean values ranging from 3.35 to 3.46 and an overall weighted mean of 3.41, interpreted as Strongly Agree. Teachers reported minimal difficulty in navigating the application's features and functions (WM = 3.46), understanding and utilizing advanced settings or customization options (WM = 3.41), and configuring the application to meet specific grading needs (WM = 3.43). These findings suggest that the application is generally user-friendly and does not require extensive technical expertise for effective use.

However, the lowest weighted mean was observed for keeping up with the latest application upgrades or versions (WM = 3.35), indicating a relative challenge in this area. This finding underlines the need for administrative support, particularly in providing guidance on application updates, subscription management, and version compatibility. Institutional assistance through technical orientations, update notifications, or centralized subscription arrangements can help mitigate these challenges. These results align with Plump and Larosa (2017), who noted that while technological tools may present challenges, user-friendly design and adequate support can significantly improve teachers' acceptance and effective utilization of educational technologies.

Table 7: Device Compatibility

Criteria	Weighted Mean	Adjectival Rating
1. When I try to install or update the ZipGrade app on my mobile device, I do not encounter compatibility issues.	3.46	SA
2. When I use the ZipGrade app on my device, I do not encounter slow performance or lag.	3.22	A
3. On my mobile device, I'm not having difficulty accessing or using key functions of the ZipGrade app.	3.35	SA
4. When attempting to synchronize data between the ZipGrade app and other devices or platforms, I do not encounter compatibility concerns.	3.35	SA
5. On my device, the ZipGrade app supports the necessary connectivity options (e.g., Bluetooth, Wi-Fi).	3.41	SA
Overall	3.36	SA

Legend: SA- Strongly Agree, A- Agree, DA-Disagree, SDA- Strongly Disagree

The teachers generally perceived the ZipGrade application as compatible with their mobile devices, with weighted mean values ranging from 3.22 to 3.46 and an overall weighted mean of 3.36, interpreted as Strongly Agree. Teachers reported minimal issues when installing or updating the application on their devices (WM = 3.46) and experienced ease in accessing and using key application functions (WM = 3.35). The application was also perceived to support necessary connectivity options, such as Bluetooth and Wi-Fi (WM = 3.41), and to allow relatively smooth data synchronization (WM = 3.35).

suggesting that some teachers experienced occasional lag or slow performance during use. This finding highlights the need for administrative support in ensuring access to adequate devices, stable internet connectivity, and updated system requirements to optimize application performance. Overall, these findings suggest that while the application is largely compatible across devices, institutional support and user guidance remain essential to ensure consistent and efficient performance.

However, a comparatively lower weighted mean was observed for application speed and performance (WM = 3.22, Agree),

Table 8: User Interface

Criteria	Weighted Mean	Adjectival Rating
1. The ZipGrade app's user interface is simple and straightforward.	3.61	SA
2. The ZipGrade app's design and aesthetic are visually appealing and user-friendly.	3.61	SA
3. The labels and icons used in the ZipGrade app are clear and easy to understand.	3.59	SA
4. The ZipGrade app's font size and text readability are sufficient for comfortable use.	3.54	SA
5. The ZipGrade app's color design and contrast are visually appealing and aid in readability.	3.54	SA
Overall	3.58	SA

Legend: SA- Strongly Agree, A- Agree, DA-Disagree, SDA- Strongly Disagree

Teachers generally perceived the ZipGrade application's user interface positively, with weighted mean values ranging from 3.54 to 3.61 and an overall weighted mean of 3.58, interpreted as Strongly Agree. Teachers strongly agreed that the application's interface is simple and straightforward (WM = 3.61) and that its design and aesthetics are visually appealing and user-friendly (WM = 3.61). The clarity of labels and icons (WM = 3.59) further suggests that the interface supports ease of navigation and reduces the cognitive effort required during grading tasks.

However, slightly lower weighted means were observed for font size, text readability, and color design and contrast (WM = 3.54), indicating minor usability concerns. While these aspects were still positively rated, the findings highlight the need for administrative and technical support in helping teachers optimize display settings or adapt usage strategies for extended grading sessions. Overall, the results suggest that the user-friendly interface of the application contributes to efficient grading, while targeted guidance can further enhance user comfort and sustained use.

Table 9: Scanning Accuracy

Criteria	Weighted Mean	Adjectival Rating
1. The ZipGrade app finds and recognizes answers on scanned papers with high accuracy.	3.65	SA
2. On scanned papers, the ZipGrade app can accommodate different handwriting or marking styles	3.20	A
3. The ZipGrade app provides clear feedback or error messages when scanning errors occur.	3.52	SA
4. The ZipGrade app has no difficulty dealing with papers that have smudges, erasures, or other blemishes that may compromise scanning accuracy.	3.50	SA
5. Using the ZipGrade app, I have no difficulty scanning papers that are folded, wrinkled, or have irregular shapes.	3.43	SA
Overall	3.46	SA

Legend: SA- Strongly Agree, A- Agree, DA-Disagree, SDA- Strongly Disagree

Teachers' responses show a generally favorable evaluation of the ZipGrade application's scanning accuracy, with weighted mean values ranging from 3.20 to 3.65 and an overall weighted mean of 3.46, interpreted as Strongly Agree. The highest level of agreement was recorded for the application's ability to accurately detect and recognize answers on scanned papers (WM = 3.65), indicating strong teacher confidence in its core scanning functionality during assessment checking. The application was also positively rated for providing clear feedback or error messages when scanning issues occur (WM = 3.52) and for handling papers with smudges, erasures, or other blemishes that may affect scan quality (WM = 3.50).

Relatively lower agreement was observed in the application's ability to accommodate diverse handwriting or marking styles (WM = 3.20, Agree), suggesting that variations in student markings may occasionally influence scanning performance. Teachers likewise reported minimal difficulty in scanning papers that are folded, wrinkled, or irregularly shaped (WM = 3.43), reflecting the application's adaptability to typical classroom assessment conditions. Overall, these results highlight the importance of consistent assessment practices, such as clear student marking instructions and standardized answer formats, to ensure optimal scanning accuracy and reliable automated grading outcomes.

Table 10: Data Management and Export

Criteria	Weighted Mean	Adjectival Rating
1. I'm not having difficulty importing student data into the ZipGrade app.	3.37	SA
2. It is easy for me to customize and organize assessment data within the ZipGrade app according to my needs.	3.28	SA
3. The ZipGrade app allows me to easily generate reports and summaries of assessment data.	3.61	SA
4. I'm not having difficulty in securely storing assessment data within the ZipGrade app.	3.39	SA
5. The ZipGrade app includes enough integration options for merging assessment data with other educational applications or solutions.	1.46	SDA

Legend: SA- Strongly Agree, A- Agree, DA-Disagree, SDA- Strongly Disagree

Teachers' responses reflect a mixed assessment of the ZipGrade application in terms of data management and export, with weighted mean values ranging from 1.46 to 3.61 and an overall weighted mean of 3.02, interpreted as Agree. Positive ratings were observed in the ease of generating reports and summaries of assessment data (WM = 3.61), securely storing assessment data (WM = 3.39), importing student data (WM = 3.37), and customizing or organizing assessment data according to teachers' needs (WM = 3.28). These results indicate that the application effectively supports essential data-handling tasks related to assessment documentation and reporting.

However, a substantially lower rating was obtained for the application's ability to integrate or merge assessment data with other educational applications (WM = 1.46, Strongly Disagree), revealing a notable limitation in interoperability. This limitation explains why this key area registered the lowest overall mean among the dimensions examined. While teachers expressed satisfaction with the app's internal data management functions, restricted integration options may hinder its alignment with existing school systems and digital platforms. This finding is consistent with Iwamoto (2017), who emphasized that limited technological integration, unequal access to classroom technology, school culture, and lack of institutional support can significantly influence teachers' adoption and effective use of educational technologies.

RECOMMENDATIONS

The recommendations are directly anchored in the framework illustrated in Figure 1, which emphasizes the interdependent roles of teacher factors and administrative factors in influencing the effective utilization of the ZipGrade application. As shown in the model, teacher factors reflect the empirically established advantages of ZipGrade, including improved grading efficiency, acceptable accuracy, and minimal challenges and limitations. These advantages serve as the foundation for teachers' willingness and capacity to adopt and sustain the use of the application in classroom assessment.

However, the model also highlights that these teacher-level benefits can be fully realized only when complemented by strong administrative support mechanisms. The administrative factor, as illustrated in the figure, consists of teacher training, logistical support, and subscription support, which function as enabling conditions that strengthen teachers' utilization of the application. Teacher training ensures that educators possess the technical competence and assessment literacy necessary to maximize ZipGrade's features, while logistical support provides access to compatible devices, standardized assessment materials, and stable connectivity. Subscription support further addresses limitations related to app updates, advanced functionalities, and data management, thereby reducing barriers to sustained use.

Taken together, the framework demonstrates that teachers' utilization of the ZipGrade application is not solely an individual initiative but a shared institutional responsibility. The recommendation, therefore, calls for schools to adopt a coordinated, system-level approach in which administrative

policies and resources are aligned with teachers' assessment practices. By operationalizing the components shown in the figure, schools can institutionalize technology-assisted assessment, promote consistency and efficiency in grading, and support data-informed instructional decision-making. Ultimately, the model provides a practical guide for school leaders and policymakers in integrating digital assessment tools into existing assessment systems, ensuring both instructional effectiveness and sustainability.

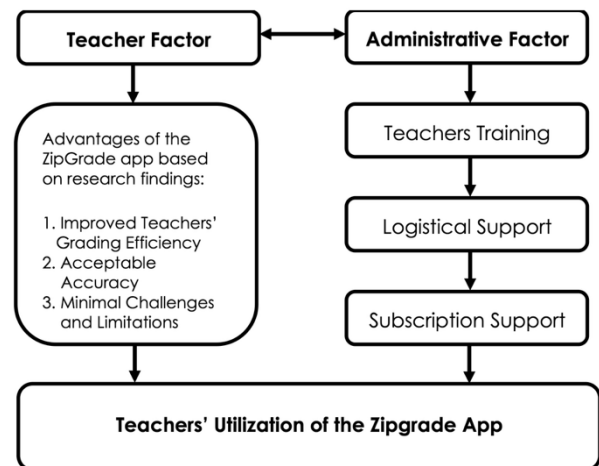


Figure 1: Teachers' App Utilization Guide

CONCLUSION

Based on the findings of the study, the ZipGrade application demonstrated a positive effect on teachers' grading efficiency and ensured acceptable levels of grading accuracy when used as a grading tool for students' tests and examinations. The results also showed that teachers experienced minimal challenges and limitations in utilizing the application, indicating its practicality and ease of integration into existing assessment practices. In light of these findings, the implementation of a school-level program that formalizes the use of the ZipGrade application, supported by appropriate administrative measures, may further enhance assessment efficiency, promote consistency in grading, and improve overall classroom assessment practices.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

CONTRIBUTIONS OF INDIVIDUAL AUTHORS

R.E.G. conceptualized the study, designed the methodology, collected and analyzed the data, and drafted the manuscript.

M.P.G. assisted in data collection, contributed to the interpretation of results, and reviewed and revised the manuscript. Both authors read and approved the final version of the manuscript.

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