Developing Socrative as a grammar assessment platform for senior high school students

Farkhan Sholakhudin [1], Sri Wahyuni [1]✉, Ima Fitriyah [1], Dewi Nur Suci [1]

[1] UIN Syekh Wasil Kediri, Indonesia

✉ sriwahyuni@iainkediri.ac.id

Abstract:

This research aims to develop an interactive grammar assessment tool utilising the Socrative platform for eleventh-grade students at MAN 2 Kota Kediri. The instruments used for data collection included a grammar test, validated by experts to ensure content validity, and note-taking for expert feedback. The Research and Development (R&D) method was employed, grounded in Borg and Gall's (1983) model and Harris's (1969) test construction approach, the study followed systematic phases including needs analysis, test design, expert validation, field testing, and item analysis, for its interactive and student-centered nature, which aligns with Deci and Ryan's (2000), Self-Determination Theory. The developed test consisted of 25 multiple-choice grammar questions delivered via the Socrative platform. Validation results showed that 18 items (72%) were valid, meeting the threshold Crocker and Algina (2006) recommended for early-stage field use. The instrument's reliability was high, with a Cronbach's Alpha coefficient of 0.882. Item analysis revealed that most items had acceptable discrimination power. At the same time, the difficulty index showed a predominance of easy items, indicating the need for more balanced test content. The interactive nature of the Socrative platform allows for immediate feedback, fostering student engagement and enhancing grammar comprehension. Additionally, the findings support using digital tools like Socrative to create valid, reliable, and engaging language assessments for EFL learners in secondary education.

Keywords: English subject; grammar assessment; Socrative method.

Introduction

Grammar forms the structural foundation of effective communication in the English language. Mastery of grammar enables learners to produce coherent and accurate sentences, facilitating clearer expression of ideas in spoken and written forms. In educational contexts, particularly at the senior high school level, grammar instruction is about learning rules and applying them meaningfully in authentic language use. Consequently, grammar assessment is vital in measuring students' understanding and practical application of grammatical concepts. Effective grammar assessments must go beyond rote memorisation, evaluating students' ability to apply grammar accurately in varied communicative situations. According to Brown (2004), a well-designed grammar assessment should be valid, reliable, and reflective of real-world language tasks. In this regard, integrating technology into grammar assessment offers opportunities to enhance traditional testing formats, making them more interactive, authentic, and accessible.

Integrating educational technology into language learning and assessment has gained momentum recently. Among these innovations, Socrative—a real-time student response system—has emerged as a helpful tool for formative assessments, offering features that engage learners interactively while providing immediate instructor feedback. Numerous studies have demonstrated the positive impact of Socrative on learner engagement and grammar instruction outcomes in higher education settings (Afrizal et al., 2020; Nabila et al., 2023). However, these studies primarily focus on university contexts, with minimal attention paid to how Socrative can be effectively developed and utilised as a grammar assessment platform for secondary education students. Furthermore, although some research has explored Socrative's broader impact on secondary students' reading comprehension and general learning perceptions (Putri et al., 2023), investigations specifically targeting grammar assessment are notably limited. Thus, a clear need remains to bridge this gap by developing Socrative as a targeted grammar assessment tool tailored to senior high school students' unique needs.

Several studies have investigated Socrative's role in language learning, particularly in university-level grammar classes. Afrizal et al. (2020) found that university students viewed Socrative positively for grammar learning, highlighting its usefulness and ease of use. Similarly, Nabila et al. (2023) reported positive perceptions from students and lecturers regarding Socrative's application in teaching tenses in undergraduate grammar courses.

Despite these encouraging findings, the role of Socrative as a dedicated grammar assessment tool in secondary education, especially among senior high school students, remains notably underexplored. Existing studies in secondary contexts have mainly focused on broader skills such as reading comprehension or general perceptions of online assessment platforms (Putri et al., 2023). Although Maesaroh et al. (2020) investigated Socrative's effectiveness for grammar learning, their study primarily emphasised student interest levels rather than its formal grammar assessment platform capability. This evident lack of focused research on grammar assessment using Socrative in secondary education highlights a critical gap. Therefore, there is a pressing need to develop and adapt Socrative specifically for assessing grammar proficiency among senior high school students, enabling teachers to utilise more effective, technology-driven tools for improving assessment practices and learning outcomes.

This research aims to develop Socrative as a specialised grammar assessment platform tailored for senior high school students. Building on previous findings that underline Socrative's potential for increasing student engagement, motivation, and performance in language learning (Afrizal et al., 2020; Maesaroh et al., 2020; Nabila et al., 2023), this study seeks to extend its application beyond formative learning activities into structured grammar evaluation. Moreover, the study addresses the call for more technology-enhanced assessments aligned with secondary education needs (Putri et al.,

2023). By focusing on grammar assessment rather than general learning outcomes, this research intends to provide empirical evidence on how Socrative can be adapted to support accurate, efficient, and engaging grammar testing in senior high school settings. Ultimately, the goal is to offer educators a practical, evidence-based model for integrating Socrative into classroom grammar assessments, thus contributing to more innovative and effective language evaluation practices.

Method

This research used the Research and Development (R&D) method proposed by Gall et al. (2007), aiming to design, develop, and validate a Socrative-based grammar assessment platform for senior high school students. The instruments used in this study included a grammar test, which an expert evaluated as part of the validation process. The grammar test collected expert feedback to ensure the product met pedagogical and technical standards. It was then tested and refined through an iterative cycle of validation and revision, ensuring its effectiveness and alignment with the study's objective.

The researchers modified the process steps to adapt them based on the identified problems, research objectives, and time constraints in conducting this study. This study followed an adaptation model that included: *First*, the preliminary research, in this stage, the researcher conducted the research and information collection during the observation of teaching and learning in the Eleventh Grade of Islamic Senior High School 2 Kediri. Those included identifying common instructional challenges, assessing students' needs, reviewing relevant literature, and preparing research documentation. A needs analysis was also conducted through student questionnaires and teacher interviews, revealing limitations in traditional grammar testing and a desire for more engaging digital tools.

Second, the research integrated technology-enhanced learning and grammar instruction principles in the product development phase. The Socrative platform was selected for its interactive and student-centred nature, which aligns with Ryan & Deci (2000), Self-Determination Theory. This theory emphasises that learners are more motivated and perform better when they experience autonomy, competence, and relatedness—factors supported by the real-time feedback, gamified format, and collaborative potential of Socrative. The test construction process followed Borg and Gall's (1983) R&D model and Harris's (1969) guidelines, involving systematic planning, item writing, review, and empirical validation.

Third, in line with these frameworks, an expert validation phase was conducted by an English teacher from Islamic Senior High School 2 Kediri, who assessed the test based on content relevance, clarity, and alignment with curriculum standards. This evaluation aimed to determine whether the test met established criteria for a valid and reliable grammar assessment instrument.

The fourth, the field-testing phase, was implemented during regular English class sessions. Students completed a series of grammar quizzes on Socrative under teacher supervision. Data were collected through students' quiz results, a post-implementation questionnaire measuring perceived ease of use and usefulness (adapted from the Technology Acceptance Model by Davis, 1989), and observational notes regarding student engagement and interaction with the platform.

Finally, feedback gathered from students and the supervising English teacher was analysed in the product revision phase. Improvements were made to enhance the clarity of instructions, the difficulty level of the questions, and the overall user experience. The revised platform incorporated content adjustments and interface improvements to better support grammar assessment in authentic classroom contexts. Through this systematic and iterative process, the study ensures that the developed Socrative-based grammar assessment tool is responsive to user needs, educationally sound, and ready for broader application in secondary education settings.

The data collected in this study have been essential in determining the validity and

applicability of the tests developed. For the initial data, the research conducted an observation at MAN 2 Kota Kediri. The participants in this study are 11th-grade students who consist of 25 students with diverse learning characteristics. The class was chosen because it is a language class. Most of the students demonstrated intermediate-level English proficiency.

In contrast, approximately 15% of the students performed above average, showing stronger grammar competency. A purposive sampling technique was used to select participants who had prior experience with basic digital learning tools, ensuring their ability to engage meaningfully with the Socrative platform. The trial setting was conducted within a regular classroom environment, during scheduled English lessons, to maintain ecological validity and ensure that students interacted with the platform under authentic learning conditions. To uphold ethical standards, informed consent was obtained from the school administration, and explicit permission was granted by the English teacher who supervised the study sessions. Students were informed that their participation was voluntary, that their academic standing would not be affected by the research, and that their responses would be kept confidential and used solely for research purposes. By integrating ethical research practices with systematic development and field-testing procedures, this study ensures that the resulting Socrative-based grammar assessment platform is pedagogically effective and responsibly implemented within the educational setting.

Finding and Discussion

This section presents the results of the preliminary study, information collection, expert validation, and field testing of the Socrative-based grammar assessment. After completing the first draft of the test, an expert validation process was conducted to ensure content relevance and alignment with curriculum standards. The test blueprint was reviewed by an English teacher with expertise in language assessment, and revisions were made accordingly before the platform was tried with students.

Findings

The Preliminary Research and Information Collection

The preliminary study, carried out through classroom observations and teacher interviews, revealed that students were primarily exposed to paper-based grammar tests, which they found monotonous and disengaging. Instructional materials were primarily sourced from textbooks and online resources, leading to a lack of contextualised grammar practice. This traditional method contributed to students' reduced engagement and difficulties in grammar mastery, emphasising the need for a more interactive, technology-based assessment approach.

In response, the researcher developed a grammar assessment comprising 25 multiple-choice questions integrated into the Socrative platform, allowing students to choose the correct answer by selecting A, B, C or D. The items covered various grammar topics, including tenses, conditional sentences, conjunctions, passive voice, and prepositions, which relevant to the level of eleventh-grade students.

The result of the Expert's Validation

After the preliminary product was developed, it was reviewed by an expert to evaluate its quality. The draft of the grammar comprehension test was given to an experienced English teacher for validation. The expert noted that to better align the topics with the current curriculum, action verbs, relative pronouns, and error identification, the expert used note-taking to give comments and some adjustments. The expert's responses showed general agreement with the structure and content of the test. The teacher found the language and question format clear and mostly complete. The vocabulary, sentence structure, and overall difficulty level were appropriate for senior high school students. However, the expert suggested a few additions and improvements to make the test more transparent and more relevant. Based on this feedback, the content of the test was judged to be valid and understandable, making it suitable for classroom use.

The validation analysis of the developed grammar assessment revealed that out of 25 multiple-choice items, 18 were categorised as valid based on the item-total correlation, using an r-table threshold of 0.355. This means that 72% of the test items met the required standard for item validity. According to Crocker & Algina (1986), achieving more than 70% valid items during the initial stages of test development is considered acceptable for implementation in classroom settings. This benchmark supports the readiness of the developed test for field use, indicating that most items are functionally sound and aligned with the intended learning objectives. The remaining 28% of items, identified as invalid, were recommended for revision or replacement to improve overall test quality. These findings suggest that the developed grammar assessment has strong initial validity and can be confidently used in further classroom trials or pilot studies.

After the expert validated the revised draft of the developed test, it was administered to eleventh-grade students at a senior high school in Kediri on December 2nd, 2024. The trial's purpose was to evaluate students' understanding and knowledge of the grammar topics covered in the test, and to ensure that the assessment was appropriate for their level. The researcher acted as the teacher during the trial and facilitated the test implementation. The tryout proceeded successfully, with students showing enthusiasm and motivation throughout the session. The classroom atmosphere was conducive to learning, as the students were actively engaged and eager to participate in the activity. Overall, the testing process ran smoothly. Following the trial, the data collected were analysed using SPSS version 16 to examine the validity and reliability of the test items.

Validity Testing

To check the validity, the researcher has compared the r-table and r-value. If the r-value > r-table, the item is declared valid; If the r-value ≤ r-table, the item is declared invalid, and items with a correlation coefficient greater than 0.3 are considered valid. From the comparison, it is found that there are 18 valid questions demonstrating strong validity with correlation coefficients above 0.5 and 7 invalid questions. The results of the validity test are presented in Table 1 below.

Table 1. Result of the Validity

Item Numbers	R Value	R table	Interpretation
1	0.318	0,355	INVALID
2	0.567	0,355	VALID
3	0.436	0,355	VALID
4	0.768	0,355	VALID
5	0.277	0,355	INVALID
6	0.691	0,355	VALID
7	0.317	0,355	INVALID
8	0.464	0,355	VALID
9	0.417	0,355	INVALID
10	0.441	0,355	VALID
11	0.490	0,355	VALID
12	0.474	0,355	VALID
13	0.720	0,355	VALID
14	0.685	0,355	VALID
15	0.787	0,355	VALID
16	0.588	0,355	VALID
17	0.516	0,355	VALID
18	0.621	0,355	VALID
19	0.721	0,355	VALID
20	0.634	0,355	VALID
21	0.556	0,355	VALID
22	0.079	0,355	INVALID
23	0.489	0,355	VALID

Item Numbers	R Value	R table	Interpretation
24	0.257	0,355	INVALID
25	0.351	0,355	INVALID

Reliability Testing

Furthermore, to check the reliability of the test, there is a formula: If alpha >0.60, the item is declared reliable. However, if alpha ≤ 0.60, the item is declared unreliable. The reliability of the test was measured using Cronbach's Alpha. A value above 0.7 indicates good reliability. The results of the reliability test are presented in Table 2 below.

Table 2. Result of the Reliability

Reliability Statistics	
Cronbach's Alpha	N of Items
.882	25

Based on Table 2 above, the alpha coefficient is 0.882. The correlation result means the test is reliable because the alpha is >0.60.

Item Difficulty

Item difficulty is a more important technique for item analysis for selecting and rejecting the test items, which is utilised by research scholars in the present study (Gul et al, 2022). The researcher uses Microsoft Excel to determine the item difficulty and item discrimination scores and verify the test's validity and reliability. The difficulty level of the questions is presented in Table 3.

Table 3. Criteria of Item Difficulty

Category	Difficulty (%)
Difficult	0-27
Medium	28-72
Easy	73-100

The result of the item difficulty score calculation shows that 13 questions are categorised as easy (numbers 1,3,5,8,9,17, and 22), four questions are categorised as medium (numbers 2,6,7,10,12,13,14,15,16,18,19,20,21,23,24, and 25). Three are categorised as difficult (4 and 11). See Table 4 below for the details.

Table 4. Items Difficulty

Items	Mean	Interpretation
Q1	0,77	EASY
Q2	0,68	MEDIUM
Q3	0,86	EASY
Q4	0,27	DIFFICULT
Q5	0,95	EASY
Q6	0,55	MEDIUM
Q7	0,45	MEDIUM
Q8	0,73	EASY
Q9	0,82	EASY
Q10	0,59	MEDIUM
Q11	0,27	DIFFICULT
Q12	0,55	MEDIUM
Q13	0,62	MEDIUM
Q14	0,64	MEDIUM
Q15	0,59	MEDIUM
Q16	0,64	MEDIUM
Q17	0,73	EASY
Q18	0,64	MEDIUM
Q19	0,41	MEDIUM
Q20	0,50	MEDIUM
Q21	0,64	MEDIUM
Q22	0.77	EASY

Q23	0.59	MEDIUM
Q24	0,55	MEDIUM
Q25	0.68	MEDIUM

Item Discrimination

The last aspect to be considered is the score of item discrimination. It follows the criteria as presented in Table 5.

Table 5. The Criteria of Item Discrimination

No.	Discrimination Index	Description
1	00.00 - 0.20	Poor
2	0.20 - 0.40	Moderate
3	0.40 – 0.70	Good
4	0.70 – 1.00	Excellent

The discrimination indices for the test items range from -0.1 to 0.8. Items with high discrimination indices, such as Q15 (0.8) and Q6 (0.7), effectively distinguish between high-performing and low-performing students. Conversely, items with low discrimination indices, such as Q22 (-0.1), Q5(0,1), Q24(0,2), Q7(0,2), are less effective. Items with high discrimination indices are particularly valuable for assessments as they can differentiate between students who have mastered the material and those who have not. Items with low discrimination indices should be reviewed and revised to enhance their ability to discriminate between different levels of student performance. Improving these items will help make the test a more effective tool for measuring student learning outcomes.

Table 5. 1 Item Discriminations

Item	ID	CATEGORY
Q1	0,3	Moderate
Q2	0,5	Good
Q3	0,3	Moderate
Q4	0,5	Good
Q5	0,1	Poor
Q6	0,7	Excellent
Q7	0,2	Poor
Q8	0,5	Good
Q9	0,4	Moderate
Q10	0,5	Good
Q11	0,4	Moderate
Q12	0,4	Moderate
Q13	0,6	Good
Q14	0,5	Good
Q15	0,8	Excellent
Q16	0,5	Good
Q17	0,5	Good
Q18	0,5	Good
Q19	0,5	Good
Q20	0,5	Good
Q21	0,5	Good
Q22	-0,1	Very Poor
Q23	0,3	Moderate
Q24	0,2	Poor

Item	ID	CATEGORY
Q25	0,3	Moderate

Discussion

The findings are consistent with previous studies, such as those by Castillo-Cuesta (2020) and Akan et al. (2022), which emphasise the pedagogical value of integrating technology-based tools in grammar instruction, particularly in enhancing the validity and reliability of language assessments. The findings of this research show that the analysis of the Socrative-based grammar assessment for eleventh-grade students at MAN 2 Kota Kediri provides meaningful insights into the test's effectiveness and areas for improvement. The assessment tool demonstrated strong content validity and internal consistency, making it reliable for evaluating students' grammar proficiency. Out of the 25 test items developed, 18 were valid, indicating a strong alignment with the intended grammar learning objectives. This result meets the validity threshold recommended by Crocker & Algina (1986), who state that over 70% of valid items in the initial stage of test development are acceptable for field implementation. Furthermore, reliability analysis using Cronbach's Alpha yielded a coefficient of 0.882, signifying a high level of internal consistency among test items.

The item discrimination analysis showed that most items could effectively distinguish between high- and low-performing students, with 12 items categorised as good, two as very good, and only a few marked for revision or rejection. However, the item difficulty analysis revealed that many items were classified as easy, suggesting that the overall test may not sufficiently challenge more advanced learners. To achieve a more balanced assessment that addresses the full range of student abilities, including more moderately difficult and complex items, is recommended in future revisions. These results highlight the strengths and opportunities for enhancement in the current version of the Socrative-based grammar test.

Additionally, item analysis played a critical role in validating the test. Based on the guidance of Darling-Hammond et al. (2013) andBrown (2004), high-quality language assessments should consist of test items that are appropriately challenging and capable of distinguishing between higher- and lower-performing students. Therefore, the analysis of item difficulty and discrimination in this study was not only necessary but also aligned with best practices in language testing, ensuring the developed test was both pedagogically meaningful and psychometrically sound

The findings of this study indicate that the use of Socrative as a grammar assessment platform not only supported the development of a valid and reliable test but also enhanced student engagement during the testing process. One likely reason for this high motivation level is the platform's ability to provide immediate feedback. According to Ryan & Deci (2000), Self-Determination Theory, intrinsic motivation is fostered when learners experience autonomy and competence, two psychological needs directly supported by real-time feedback. Socrative allows students to independently monitor their progress, which empowers them to take ownership of their learning and reinforces their confidence. This autonomy-driven environment likely contributed to the increased enthusiasm observed during the trial.

Despite the positive outcomes related to item validity, reliability, and student engagement, one limitation of this study is the absence of a pre-test and post-test design to measure learning gains. Without this comparative data, it is difficult to determine whether students' grammar proficiency improved due to engaging with the Socrative-based assessment tool. Schildkamp et al. (2020) emphasised that formative assessments are most effective when they are part of an ongoing process that includes diagnostic testing, targeted feedback, and measurable progress over time. Including pre-test and post-test scores would have provided more concrete evidence of learning improvement and the tool's instructional impact. Such data would enhance the credibility of the findings and offer stronger support for integrating Socrative into grammar instruction as both an evaluative and formative tool. Future studies are therefore encouraged to

incorporate pre/post assessment structures to capture the full pedagogical value of interactive, technology-based grammar assessments. Furthermore, the scope of this study was limited to a single school and grade level, which restricts the generalizability of the results. As emphasised by Weiss et al. (2023), acknowledging such limitations is essential to maintaining research transparency and accurately framing the implications of the study.

In conclusion, the findings of this study confirm that Socrative serves not only as a valid and reliable grammar assessment tool but also as a platform that fosters active student engagement through its interactive features and real-time feedback. Integrating technology in assessment aligns with both pedagogical theory and practical classroom needs, particularly in enhancing learner motivation and autonomy as Ryan & Deci (2000) suggested. While the study offers encouraging results, its limited scope and the absence of pre-test/post-test comparisons highlight areas for improvement in future research. By addressing these limitations, subsequent studies can build a more comprehensive understanding of how digital assessment tools like Socrative contribute to both the measurement and development of grammar skills in EFL contexts. Ultimately, this research reinforces the growing relevance of technology-enhanced assessments in shaping more engaging, effective, and data-informed language learning environments.

Conclusion

This study successfully developed and validated a grammar assessment tool using Socrative for eleventh-grade students at MAN 2 Kota Kediri. The instrument demonstrated strong content validity and high internal consistency, with a large proportion of items classified as valid and a reliability coefficient indicating it met psychometric standards suitable for educational use. The test also exhibited acceptable levels of item discrimination. However, the dominance of items with lower difficulty levels suggests that further refinement is needed to create a more balanced range of item difficulty.

Beyond its psychometric soundness, the tool contributed positively to student engagement and motivation. This effect was likely influenced by the instant feedback mechanism available through Socrative, which supports learners' sense of autonomy and competence in the learning process.

Despite these positive outcomes, the study had certain limitations. The absence of a comparative pre-test and post-test design reduced the ability to directly measure learning improvement. Additionally, the research was confined to a single school and grade level, which limits the generalizability of the findings. Nevertheless, this study provides meaningful insights into the integration of digital tools like Socrative in classroom-based grammar assessment.

Future investigations should examine the long-term effects of Socrative-based assessments on student learning across diverse educational settings and proficiency levels. Further research could also include comparative studies with other digital platforms, explore their use in different assessment contexts, or investigate the perspectives and preparedness of educators in applying such tools effectively.

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