Development of Interactive Worksheets Through Liveworksheet for Contextual Written Language Skills Course Based on Multiple Intelligence in English Education Study Program

Anggraini Thesisia Saragih[1], Ayunda Wulandari[2], Muhammad Natsir[3] , Rika[4], Farida Hanim Saragih[5]

{ anggrainisaragih@unimed.ac.id[1], ayundawulandari16@gmail.com[2]}

English Education Study Program of Universitas Negeri Medan, Indonesia 20221[1,2,3]

Abstract. This study seeks to create interactive worksheets with "Liveworksheet" technology, coupled with the theory of multiple intelligence. This is motivated by the need to create more personalized and effective learning experiences for learners in the Contextual Written Language Skills course. This study produced a research and development (R&D) methodology utilizing the ADDIE model to create an interactive worksheet product tailored to accommodate diverse student learning styles and preferences. The development phases commenced with needs analysis, followed by design, development, implementation, and evaluation. The obtained data comprised needs analysis results and interviews with students and professors associated with the relevant course. The research findings demonstrate that interactive worksheets grounded in multiple intelligence can enhance students' information retention and elevate their engagement and motivation in the reality of contextual and practical English language learning. This research presents an advancement in the creation of student-centered educational materials and incorporates contemporary technology to enhance effective and personalized learning results

Keywords: Development, Multiple, Intelligence, Technology, Worksheet

1 Introduction

Effective communication between educators and students is essential for the effectiveness of the learning process within the educational landscape. This relationship is profoundly influenced by the educational material and the modes of information dissemination. Educators are pivotal in developing effective learning strategies to facilitate students' comprehension of the material presented. One approach they employ is the utilization of Student Worksheets (LKPD). LKPD is a strategic tool designed to guide students through a series of structured assignments. According to Majid and the Ministry of National Education, LKPD functions as a guide that helps students carry out structured learning activities. With technological developments, LKPD has evolved into an electronic format or E-LKPD, which creates an environmentally friendly

and efficient learning environment. Its function as an alternative in introducing learning activities, maximizing the use of learning tools, and increasing student interest and attention are important points in the modern learning approach[1]. Yulaika et al. emphasize that creating engaging electronic teaching materials is an effective method to improve student performance[2].

In the professional execution of educational tasks, a comprehensive grasp of the teaching and learning processes, along with proficiency in learning strategies, is vital. According to Mansyur, learning strategies serve as a fundamental framework for attaining educational objectives[3]. The creation of instructional materials within the framework of courses is inherently linked to the formulation of the curriculum for the study program. Teaching material products must consider the competencies and needs of graduate users. Worksheets are a fundamental component of lecturers' teaching materials, significantly contributing to the establishment of an organized learning environment. As Prastowo, worksheets are printed instructional resources that encompass content, summaries, and guidelines for learning activities, applicable to both theoretical and practical contexts[4]. In a study by Nurbayani et al. (2021), worksheets are described as interactive because they actively engage students in the learning process[5]. The development of these worksheets, known as LKPD (Lembar Kerja Peserta Didik or student worksheets), utilizes *Liveworksheets*, a free tool available on Google. This application allows teachers to transform traditional worksheets (in formats such as documents, PDFs, JPGs, or PNGs) into interactive ones. By using interactive LKPDs, students can complete exercises online and submit their answers electronically (as noted by Fitri in the study by Setia Listi & Mulia Kurnianti, 2022)[6].

Liveworksheet is a free web application for education that offers teachers, lecturers, students, and thousands of interactive worksheets. With the ease of converting traditional worksheets to an online format, Liveworksheet motivates students efficiently while reducing paper usage[7]. An autocorrect feature provides immediate feedback on student work, and the app allows online delivery of worksheets to teachers or lecturers, creating a dynamic, connected, and environmentally friendly learning experience. According to Retno, Liveworksheets are advantageous in engaging students by making the learning process resemble a game. Online activities include drag-and-drop, matching, and multiple-choice questions allowing students to see their results instantly. This not only motivates learners but also reduces the grading burden for teachers, as the platform provides immediate feedback to students[8]. LKPD can be systematically used as a tool for assessing student learning[9].

The significance of cultivating each student's intelligence as a primary ability is grounded in Howard Gardner's theory of multiple intelligences. Gardner, in his publication "Frames of Mind: The Theory of Multiple Intelligences," groups human intelligence into nine categories. By applying the concept of multiple intelligences, it is hoped that students' potential competencies can emerge and develop, forming an inclusive and relevant learning approach for the diversity of individual intelligences in the context of the course[10].

Previous research by Listi and Kurniati showed that the student worksheet (LKPD) developed was very suitable for use, The validation results for the LKPD (Learning Worksheet) assessment from subject matter experts were 82.35%, media experts 93%, and language experts 80%. The combined total from all experts reached 85%, which is categorized as "Highly Suitable." Teacher evaluations yielded a score of 90%. Additionally, student response surveys during the trial phase obtained a score of 90.7%, and during field testing, the score was 90.9%, which is

categorized as "Very Good." Thus, the efficacy of the LKPD is validated by an average score of 90.7. This research concludes that the interacting LKPD, which employs live worksheets, is exceptionally appropriate for educational settings and has garnered favorable feedback from both educators and students. Thus, interactive LKPD products are viable for integration into the learning process[11]. The implementation of student worksheets (LKPD) in learning has been found to enhance students' cognitive abilities by making them more interested in participating in lessons[12]. From these findings, it is evident that teaching aids like LKPD can play a critical role in helping students grasp and comprehend particular subjects better.

Initial observations showed that when 30 students were asked to write short paragraphs, 20 of them were not able to organize their paragraphs and ideas well. This is caused by various factors, including students' ability to understand varied learning materials. Therefore, this research aims to follow up on these problems through the creation of interactive worksheets incorporating multiple intelligence content in the Contextual Written Language Skills course.

The problem statement expressed in this research is: 1) What categories of multiple intelligences do the second year of students in the Contextual Written Text course have? 2) How is the Liveworksheet interactive worksheet developed in the Contextual Written Language Skills course? This research goal is to investigate the types of multiple intelligence possessed by the second year of students and develop an interactive Liveworksheet for the Contextual Written Language Skills course.

The output of this research includes worksheets with Live Worksheets, research reports, presentations at international seminars, proceedings, IPR research reports, and ISBN books. In theory, this research will enrich knowledge about multiple intelligences, while in practice. This research is useful for lecturers, students, and other readers.

2 Method

This research utilizes a Research and Development (R&D) technique to create Liveworksheet-based worksheets using different intelligence information for the Contextual Written Language Skills course. The development process adheres to the ADDIE framework, comprising five distinct stages: analysis, design, development, implementation, and evaluation. Data were collected through interviews and questionnaires from second-semester students in the English Language Education Study Program at Universitas Negeri Medan. The data collection methods included validation from specialists in media, content, and language, with student comments on the produced items. The data analysis employed a descriptive qualitative methodology grounded in the framework established by Miles and Huberman, encompassing three principal activities: data reduction, data presentation, and conclusion/verification. The practicality of the worksheets and student responses were assessed by expert validation and student input on a Likert scale. This study was conducted in the Department of English Language and Literature at Universitas Negeri Medan, employing a qualitative descriptive data analysis method as specified by Miles and Huberman[13].

3 Result and Discussion

A study was undertaken to assess the learning needs of learners in the Contextual Written Language course, utilizing multiple intelligences, and to create worksheets via Live-worksheets based on product differentiation. This was executed in several phases, following the procedure specified in the ADDIE 47 development research model.

Throughout the initial phase of developing multiple intelligence-based worksheets, a questionnaire was administered to analyze learners' learning styles. The objective of this stage was to identify students' preferences and dominant multiple intelligences to ensure that the resulting instructional materials align with their learning needs. The analysis of the needs assessment questionnaire, conducted as a preliminary step in the development of multiple intelligence-based worksheets for the Contextual Written Language course, revealed that students exhibit diverse intelligences, with musical intelligence being the most prevalent.

The findings of this study highlight several key aspects regarding requirements for students' writing and preferences, as well as the diverse range of multiple intelligences among second-semester students in the English Language Education Study Program at Universitas Negeri Medan. The analysis of students' writing needs reveals that 50.3% of students express an interest in writing about topics aligned with their interests, while 30.2% prefer to write guided by grammar provisions. As many as 19.5% of students want to write on digital platforms such as online worksheets. In addition, 35% of students hope to be able to express ideas in writing in several different sentence forms, 23% want to write with the right sentence structure and word choice, 16% want to use correct grammar, and 10% want to write according to the function of the text. different. Regarding the significance of writing, all students (100%) concurred that composing English texts aligned with their interests would enhance their skills. However, 40% encountered challenges in articulating ideas outside their interests, 30% struggled with proper sentence construction, and 15% experienced difficulties in comprehending instructions and a lack of motivation to write on an unappealing digital platform Writing frequency shows that 65.5% of students sometimes practice writing, 15.5% often, and 9.5% always practice writing. Analysis of multiple intelligence revealed that the majority of students (29.3%) had musical intelligence, followed by naturalistic intelligence (19.35%), visual-spatial and intrapersonal (16.13%), logical-mathematical (9.68%), linguistic (6.45%), and interpersonal (3.23%). Apart from that, 51.7% of students have never used live-worksheet interactive worksheets. Based on the need for developing interactive worksheets, 40% of students want to practice writing song lyrics to audio, 30% want to practice journaling, 20% want to practice constructing sentences from random words, and another 10% want to practice related to topics such as culture and science. Desired features include an attractive display of picture instructions (45%), online resources such as news articles, videos, and educational websites (40%), and playable audio instructions (15%). As many as 86.2% of students agreed that live worksheet interactive worksheets needed to be developed with more writing practice. These findings offer valuable insights for the development of teaching materials that are both effective and responsive to student needs. In the subsequent phase, a questionnaire was redistributed to identify the type of worksheet that aligned most closely with students' favored learning styles. This questionnaire sought to gather student feedback on the formats of worksheets or tasks that would capture their interest. The outcomes indicated the following: (1) for visual learners, students showed a stronger preference for worksheets incorporating images rather than tables, diagrams, or videos; (2) for auditory learners, students favored worksheets that involved discussion and active listening over those featuring audio recordings or instructor-led explanations; and (3) for

kinesthetic learners, the majority expressed a preference for running field observations rather than engaging in role-playing or activities involving physical features.

The subsequent phase is the development stage, where worksheets are designed based on the outcomes of the multiple intelligences analysis and the most commonly preferred types of worksheets are used as references. During this stage, a multiple intelligence-based worksheet is created for the Contextual Written Language course, aligning with the established learning goals. A validation process of the created spreadsheet ensues, then conducted by the researcher.

After the development phase, the product, a multiple intelligences-based worksheet for the Contextual Written Language course, underwent an expert validation process. During this stage, experts evaluated the worksheet based on several key aspects: language, process, product content, and visual design/layout. The validation process involved assessing 10 specific aspects using a questionnaire, which were then categorized according to an eligibility percentage rubric. These aspects were divided into three dimensions: 4 aspects associated with design and usability, 3 to content and effectiveness, and 3 to student engagement and motivation. The evaluation is carried out using a scale of very good (5), good (4), fair (3), not good (2), and very bad (1).

Table 1. Design and Usability Valdity of Dimension

A. Design and Usability Dimension				
No.	**Aspect Measured**	**Expert**		**Percentage**
		I	**II**	
1	Clarity of Instructions Provided in the Live Worksheet	5	5	100%
2	Layout and Organization of the Live Worksheet	5	5	100%
3	User-Friendliness of the Live Worksheet for Undergraduate Student	5	5	100%
4	Quality and Clarity of Multiple Intelligences Questions	5	5	100%
	Total			**100%**

The data in the table indicates that the learning aids created by the research team are exceptionally appropriate for Contextual Written Language courses. This is demonstrated by an average score of 100% in both design usability categories. Sugiyono states that this percentage lies within the range of 81%-100% and is classified as very good[14].

Table 2. Content and Effectiveness Dimension Validation

B. Content and Effectiveness Dimension				
No.	**Aspect Measured**	**Expert**		**Percentage**
		I	**II**	
1	Relevance of Contextual Written Language Skill Course	5	5	100%
2	Effectiveness of Live Worksheet in Improving Writing Skills	5	5	100%
3	Effectiveness of Multiple Intelligences in Enhancing Writing Understanding	5	4	90%
	Total			**96%**

The validation results for the entire procedure dimension demonstrate that the instructional materials and worksheets are appropriate for Contextual Written Language courses. The

validation results for the content and efficacy dimensions indicate an appropriateness rate of 96% on average. Sugiyono categorizes this percentage as very good.[15].

Table 3. Student Engagement and Motivation Validation

No.	Aspect Measured	Expert I	Expert II	Percentage
1	Engagement Level of the Live Worksheet Activities	5	5	100%
2	Impact of Live Worksheet Media on Student Motivation	5	5	100%
3	Engagement Level of Live Worksheet Media	5	5	100%
	Total			**100%**

The table indicates that the teaching materials and worksheets are acceptable for Contextual Written Language courses, particularly due to student participation and motivation. The validation findings demonstrate an average percentage of 100% for this dimension, categorizing it as "very good," according to the 81%-100% range.

Table 4. Data Recapitulation

D. Data Recapitulation

No.	Statement	Expert I	Expert II	Percentage
1	Design and Usability	5	5	100%
2	Content and Effectiveness	5	4	90%
3	Student Engagement and Motivation	5	5	100%
4	Overall Impact and Satisfaction	5	5	100%
	Score	**20**	**19**	**390%**
	Total			**97.5%**

The validation results for the appearance aspects demonstrate that the created instructional materials and worksheets are considered suitable for application. This is demonstrated by an average score of 97.5%, which, according to Sugiyono's classification, resides within the 81%-100% range, indicating a "very good" rating.[16].

The results of developing worksheets for the Contextual Written Language Skills course show very satisfying results, with an average validation score of 97.5%. This figure reflects that the teaching materials developed are included in the very good category according to Sugiyono's assessment interval, which is in the range of 81%-100%. Validation carried out by experts in design and usability, content and effectiveness, as well as student involvement and motivation shows that the worksheet is very appropriate for use in the learning process. This success is closely related to the application of the concept of multiple intelligences promoted by Howard Gardner. Based on an analysis of the multiple intelligence of second-semester students taking the Contextual Written Language Skills course, it was found that the majority of students had musical intelligence (29.3%), followed by naturalistic intelligence (19.35%), visual-spatial (16.13%), intrapersonal (16.13%), logical-mathematical (9.68%), linguistic (6.45%), and interpersonal (3.23%). This multiple intelligence-based approach allows the development of worksheets that are more inclusive and relevant to students' needs and potential.

The worksheet developed considers these different types of intelligence carefully. For example, training in writing song lyrics is integrated to support musical intelligence, while visualization

and use of images are aimed at students with visual-spatial intelligence. Apart from that, self-reflection and journaling are aimed at intrapersonal intelligence, while exercises to construct sentences from random words and exercises to answer questions related to cultural and scientific topics are designed to accommodate logical-mathematical and linguistic intelligence.

Initial survey results show that students have different preferences and needs in writing, with 50.3% favoring topics that are relevant to their interests and 30.2% following existing grammar guides. In addition, 19.5% of students prefer digital platforms such as online worksheets. In terms of writing difficulties, 40% of students find it difficult to express ideas that do not match their interest, and 30% face challenges in constructing sentences according to the function of the text. Taking these needs and preferences into consideration, the interactive worksheets developed not only function as effective learning aids but also as an engaging and motivating medium for students to improve their writing skills. The survey results showed that 86.2% of students agreed that the development of interactive live worksheets was expected to provide more diverse writing practice. According to Nahdliyatin & Winata, one way ICT (Information and Communication Technology) is implemented in education is through the use of *live worksheet* media to enhance student learning outcomes. This tool is considered an innovative educational application designed to improve the learning experience[17].

Overall, the development of this worksheet has succeeded in creating teaching materials that are high quality, relevant, and effective in improving students' writing competence. This approach that pays attention to multiple intelligences has been proven to be able to make a positive contribution to the learning process, then to maximize students' potential and understanding of the material being taught. Research has shown that interactive worksheets are viable for educational use as they fulfill the standards of feasibility, practicality, and effectiveness[18]. Additionally, Hariyati & Rachmadyanti confirmed that interactive worksheets designed through Liveworksheet are well-suited for teaching and learning practices[19].

4 Conclusion

The conclusion of this research shows that the development of multiple intelligence-based worksheets for the Contextual Written Language Skills course is very effective and suitable for use. Validation by experts indicates that the teaching materials developed obtained very high percentages in various dimensions, including design and usability (100%), content and effectiveness (96%), student engagement and motivation (100%), as well as overall impact and satisfaction (100%), with an overall average of 97.5%, which is categorized as excellent. The development of this worksheet has succeeded in maximizing the use of learning tools and increasing student interest and attention, helping students understand and form basic abilities according to course learning outcomes. This research also succeeded in identifying the types of multiple intelligences possessed by second-semester students, and the results were used to develop Liveworksheet interactive worksheets that suit their learning needs. The evaluation stage through limited trials and questionnaire analysis shows that the worksheets developed are effective and ready to be used in modern learning contexts.

References

[1] Majid, A. Perencanaan Pembelajaran: Mengembangkan Standar Kompetensi Guru. Bandung: Remaja Rosdakarya. Mudlofir, Ali. Pendidik Profesional. (2012)

[2] Yulaika, N. F., Harti, H., & Sakti, N. C.: Pengembangan Bahan Ajar Elektronik Berbasis Flip Book Untuk Meningkatkan Hasil Belajar Peserta Didik. JPEKA: Jurnal Pendidikan Ekonomi, Manajemen Dan Keuangan, 4(1), 67-76. https://doi.org/10.26740/jpeka.v4n1.p67-76 (2020)

[3] Prastowo, A.: Metode penelitian kualitatif dalam perspektif rancangan penelitian. Yogyakarta: Ar-Ruzz Media. (2011)

[4] Prastowo, A.: Metode penelitian kualitatif dalam perspektif rancangan penelitian. Yogyakarta: Ar-Ruzz Media. (2011)

[5] Nurbayani, A., Rahmawati, E., Nurfaujiah, I. I., Putriyanti, N. D., Fajriati, N. F., Safira, Y., & Ruswan, A. :Sosialisasi Penggunaan Aplikasi Liveworksheets sebagai LKPD Interaktif Bagi Guru-guru SD Negeri 1 Tegalmunjul Purwakarta. Jurnal UPI, 1(2), 126–133. http://ejournal.upi.edu/index.php/IJOCSEE/ (2021)

[6] Setia listi, R., & Mulia Kurnianti, E.: Pengembangan Lembar Kerja Peserta Didik Berbasis Interaktif pada Pembelajaran Matematika Kelas V di Madrasah Ibtidaiyah Ad'dawah. Jurnal Perseda : Jurnal Pendidikan Guru Sekolah Dasar, 5(1), 1–8. https://doi.org/10.37150/perseda.v5i1.1455 (2022)

[7] Andriyani, N., Hanafi, Y., Safitri, I. Y. B., & Hartini, S.: Penerapan Model Problem Based Learning Berbantuan Lkpd Live Worksheet Untuk Meningkatkan Keaktifan Mental Siswa Pada Pembelajaran Tematik Kelas Va. Prosiding Pendidikan Profesi Guru, September, 122-130 (2020)

[8] Retno, P. D.: Penerapan Live Worksheet pada Model Pembelajaran Flipped Learning untuk Meningkatkan Hasil Pembelajaran Peserta Didik. Jurnal Didaktika Pendidikan Dasar, 6(1), 161–176. https://doi.org/10.26811/didaktika.v6i1.366 (2022)

[9] Printina, B. I.: Media Liveworksheet untuk Evaluasi Pembelajaran Sejarah. Prodiksema. (2022)

[10] Gardner, H. Kecerdasan Majemuk. Terjemahan Drs. Alexander Sindoro dan Dr. Lyndon Saputra. Batam: Penerbit Interaksara. (2003)

[11] Listi, R.S., Kurnianti, E.M.: Pengembangan Lembar Kerja Peserta Didik Berbasis Interaktif pada Pembelajaran Matematika Kelas V di Madrasah Ibtidaiyah Ad'dawah. Jurnal Perseda, 5(1), pp. 1-8 (2022)

[12] Syamsu, F. D.: Pengembangan Lembar Kerja Peserta Didik Berorientasi Pembelajaran Discovery Learning Untuk Meningkatkan Keterampilan Berpikir Kritis Siswa. Genta Mulia: Jurnal Ilmiah Pendidikan, 11(1) (2020)

[13] Miles, M. B., and Huberman, A.M.: Qualitative Data Analysis: An Expanded Source Book, Second Edition. Sage Pub, California (1994)

[14] Sugiyono: Metode Penelitian Pendidikan Pendekatan Kuantitatif, Kualitatif dan R&D. Alfabeta, Bandung (2010)

[15] Sugiyono: Metode Penelitian Pendidikan Pendekatan Kuantitatif, Kualitatif dan R&D. Alfabeta, Bandung (2010)

[16] Sugiyono: Metode Penelitian Pendidikan Pendekatan Kuantitatif, Kualitatif dan R&D. Alfabeta, Bandung (2010)

[17] Nahdliyatin, I., & Winata, A.: Penerapan Blended Learning Pada Pelajaran Matematika Dengan Media Live Worksheets Untuk Meningkatkan Hasil Belajar Peserta Didik Materi Pengolahan Data Kelas V Di Mim 14 Pambon. Prosiding Seminar Nasional Penelitian Dan Pengabdian Masayarakat, 6(1), 591–597. (2021)

[18] Feni S A, S., Aji Dul, S., & Yasa Dwi, A.: Pengembangan LKPD Interaktif Materi Gaya Dalam Kehidupan Sehari-hari Siswa Kelas IV Sekolah Dasar. Seminar Nasional PGSD UNIKAMA, 5(November), 490–496 (2021)

[19] Hariyati, D. P., & Rachmadyanti, P.: Pengembangan Bahan Ajar Berbasis Liveworksheet untuk Siswa Sekolah Dasar Kelas V Dina Putri Hariyati. Jurnal Penelitian Pendidikan Guru Sekolah Dasar, 10(7), 1473–1483. (2022)