

Development of a Hybrid Learning Virtual Space Module Based on Local Saluan Language Wisdom in Science Education for Elementary School Students

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Abstract: This research aims to develop a hybrid learning virtual space design based on local Saluan language wisdom in science subjects for fifth grade students at SDN 3 Luwuk. The research method used is development research using the Borg and Gall model. Development steps include requirements analysis, design, development, implementation, and evaluation. The hybrid learning virtual space design developed contains science learning materials with content related to the local wisdom of the Saluan ethnic language. Learning material is presented in interactive multimedia form and equipped with various activities that can increase student participation in the learning process. Evaluation is carried out by measuring the quality of the hybrid learning virtual space in terms of effectiveness, efficiency and student satisfaction. It is hoped that this research can provide interesting learning alternatives and can increase the interest and learning outcomes of fifth grade students at SDN 3 Luwuk in science subjects by utilizing the local wisdom of the Saluan ethnic language. The targeted outcomes of this research are (1) design of a hybrid learning virtual space based on local wisdom of the Saluan language in science subjects for fifth grade students at SDN 3 Luwuk; (2) teaching materials and learning media that can improve student learning outcomes, interest and motivation; (3) alternative science learning media with hybrid learning virtual space; (4) increasing local wisdom in learning.

Keywords: Hybrid learning; Local wisdom; Saluan language; Science education; Virtual space

Introduction

The development of information technology in the world of education is increasing along with the development of science and information technology in meeting human needs. In the era of globalization, the world of education is required to be able to adapt to technological developments as an effort to improve the quality of education, both the abilities of teachers and students, especially in the learning process and life in a social context. One of the impacts of globalization in the learning process is the ability to adapt to technological developments through the use of ICT such as Android-based applications. Apart from using technology in learning, students must also have good literacy skills to

support understanding of a phenomenon. Students are required not only to understand ICT tools, but also to be able to understand the information presented through literacy. Therefore, teachers can use digital learning media to increase student literacy (Jamaluddin et al., 2022).

Sumandiyar et al., (2021) in the journal "The Effectiveness of Hybrid Learning as Instructional Media Amid the COVID-19 Pandemic" stated that hybrid learning which combines virtual spaces and physical classrooms can increase learning success. Hybrid learning offers a more flexible and up-to-date learning experience, and is able to increase interaction between students and teachers through the use of technology (Megalina et al., 2023).

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According to (Sumandiyar et al., 2021), "*Hybrid learning is a teaching model that combines face-to-face classroom learning and online learning. This approach enhances the learning experience and flexibility, allowing for a modern and effective learning experience. It can increase student interaction with teachers and classmates, while also encouraging the use of technology.*"

The use of technology in hybrid learning can help students and teachers understand the material better, as well as increase student participation in the learning process. In pandemic conditions like the current one, hybrid learning also provides a safe and effective alternative in continuing the learning process, where students can continue learning without having to meet face to face in class (Haetami, 2023). Hybrid learning, or what is also known as blended learning, is a learning approach that integrates the use of technology with face-to-face learning in a balanced way (Zainudin et al., 2023). In hybrid learning, students can gain diverse learning experiences through the use of technology such as videos, e-books, and online interactions with teachers and fellow students, while still getting a structured and directed face-to-face learning experience (Haetami, 2023). According to (Bliuc et al., 2007), hybrid learning can be defined as "a learning process that integrates two learning modes, namely technology-based learning and face-to-face learning, with the aim of improving the quality of learning".

Husnaini et al., (2023) stated in the journal "Development of Augmented Reality (AR) Based Teaching Materials in Information and Communication Technology (ICT) Subjects in High School" that hybrid learning virtual space media is an important tool for increasing the effectiveness and efficiency of learning. Choosing the right media is important to support the learning objectives to be achieved (Supriyadi, et al., 2020).

Virtual space or virtual reality (VR) has become an interesting research topic for experts in various fields, especially psychology and computer science. VR is a technology that allows users to experience virtual worlds with sensations similar to the real world. According to LaViola Jr. (2017), VR consists of three elements, namely virtual worlds, user interfaces, and hardware. Apart from that, VR technology can also provide interactive and immersive experiences to its users.

However, the use of VR in learning also has several challenges, mainly related to costs, the use of complex devices, and lack of knowledge and training for teachers in integrating VR technology into learning (Li et al., 2019). Therefore, before implementing VR technology in learning, it is necessary to assess the risks and benefits as well as careful planning to ensure the successful implementation of VR technology in learning.

According to Mahnun (2012), there are several considerations that teachers must consider in choosing the right learning media. These considerations include student abilities, learning objectives, learning strategies, ability to design and use media, costs, facilities and infrastructure, efficiency and effectiveness. Choosing the right media can improve the quality of learning and help students more easily understand the material presented by the teacher. Therefore, teachers must consider the existing factors in choosing learning media that suit the needs and learning objectives to be achieved.

Improving the quality of education in the 21st century cannot be separated from developing digital competencies. One form of developing digital competence is through the use of digital-based learning media. This is necessary because digital-based learning media has many advantages compared to traditional learning media, such as it can be accessed anytime and anywhere, is interactive, and can increase student learning motivation (Hasanudin et al., 2021).

In research conducted by Septikasari & Frasandy (2018) was found that the use of digital-based learning media can improve 21st century skills in students, such as critical thinking skills, creativity, communication, and collaboration. Apart from that, the use of digital-based learning media can also increase students' interest and motivation to learn. The use of technology-based learning media can improve 21st century skills in students, such as critical thinking skills, creativity, communication, and collaboration. Apart from that, the use of technology-based learning media can also improve student learning outcomes in history subjects.

From these two studies, it can be concluded that the development of digital or technology-based learning media is urgently needed to improve students' 21st century skills and improve the quality of education. Therefore, teachers must have adequate digital competence to be able to develop digital-based learning media that is effective and efficient in improving students' 21st century skills.

Learning media includes various learning resources needed when teachers convey information in the learning process. Learning resources that can be used as learning media include computers, televisions, projectors, pictures, digital applications, and concrete objects around students (Almarabeh et al., 2015).

The use of technology in learning, such as the use of computers and digital applications, can increase the effectiveness and efficiency of the learning process. Apart from that, the use of concrete objects can also make it easier for students to understand abstract concepts. Therefore, teachers need to choose the right learning resources to suit the material to be delivered and the characteristics of the students.

A learning module is defined as a unit or part of learning that can be used separately or integrated with other learning (Ronaldo & Aslimeri, 2020). According to Sagala (2017), a module is a learning unit that has its own characteristics and is a learning medium that contains information, guidance and instructions aimed at helping students achieve learning goals. Apart from that, a module can also be interpreted as teaching material that is arranged systematically and structured, and is designed to help students learn subject matter (Puspitasari, 2019).

Local wisdom is an important concept in education that recognizes and applies local wisdom as an integral part of the learning process (Fitriah & Ita, 2022; Yuendita & Dina, 2024). Local wisdom is defined as knowledge, customs and practices that are passed down from generation to generation in a particular society or culture (Kartodirdjo, 2000). According to Suseno (2014), local wisdom includes beliefs, norms, values and ethical systems adhered to by a particular community. In the educational context, local wisdom is integrated into the curriculum as a form of recognition of cultural diversity and development of students' character in social life (Budiarta, 2023; Mu'aziyah & Isnawati, 2023).

Local wisdom education is an approach that bases learning on local values or culture in the student's area. According to Government Regulation Number 19 of 2005 concerning National Education Standards, local wisdom education must be developed by educational units in accordance with the regional and socio-cultural potential that exists around students. This aims to ensure that students can always be attached to concrete situations around their daily lives and can be integrated into several subjects.

One of the subjects that can be integrated with local wisdom is Natural Sciences (IPA) in elementary schools. Science learning at elementary school level is integrated into thematic lessons, which examine nature and its contents as well as the interaction between the two. However, science learning is sometimes difficult for students to understand because it requires media as a learning tool to understand the material being taught.

Science (Natural Science) learning in elementary schools is a learning process that aims to introduce and develop students' understanding of science and technology, as well as practicing skills in carrying out observations, experiments, analysis, and making conclusions based on the results of observations and research (Supriyadi et al., 2019). Science learning in elementary schools must integrate four aspects, namely science process skills, science concepts, scientific thinking skills, and scientific attitudes (Jannah et al., 2020).

According to a reference source from Suyanto (2017), science learning in elementary schools must be

developed based on a constructivist approach. The constructivist approach is an approach based on the concept that students build their knowledge and understanding through direct experience and reflection on that experience. In science learning, students are invited to conduct exploration and direct observation, as well as ask questions and create hypotheses based on these experiences.

A research into the design development of hybrid learning virtual space modules based on local Saluan language wisdom in science subjects for fifth grade students at SDN 3 Luwuk aims to assist teachers in teaching thematic learning, especially science learning, by utilizing digital-based applications, especially in creating projects by students. Apart from that, local wisdom at SDN 3 Luwuk is also carried out by implementing local wisdom-based learning in the form of using saluan as one of the native regional languages of Banggai district. In this research, the problem that will be answered is how to develop a hybrid learning virtual space-based learning module for science subjects based on local Saluan language wisdom for class V students at SDN 3 Luwuk and how to measure the effectiveness and efficiency of the module. It is hoped that this will help improve the quality of learning in class V at SDN 3 Luwuk and contribute to the development of education in the region.

Method

Research into the development of hybrid learning virtual space module designs based on local saluan language wisdom in science subjects for fifth grade students at SDN 3 is a type of development research (*research and development*) using qualitative. In accordance with the understanding, this research aims to produce learning modules in the form of a hybrid learning virtual space. Design of a hybrid learning virtual space module based on local Saluan language wisdom using the Design Thinking method in science subjects for fifth grade students at SDN 3 Luwuk.

According to Borg & Gall (2007), development research procedures consist of two main objectives. The first goal is to develop new products or improve existing products through idea development, design, and prototyping. The second objective is to test the feasibility of the product in achieving the desired goals. Product feasibility can be tested through field tests, evaluations and revisions. The product development stages in research are simplified into 5 main steps described by Wasis D. Dwiyooga (2004) including product analysis, initial product development, expert validation, product testing, and product revision. In research carried out with consideration of time and conditions, a learning development model that is simpler and easier to

implement while adapting to the situation is carried out in the following stages (Figure 1).

The expert validation and revision stages are carried out in order to obtain a module that is suitable for use and the module will be tested in different schools so that later it can be revised again. After testing the instrument, research was carried out at school to obtain feasibility and validity results for the module before it could be produced and disseminated to elementary schools in Luwuk City, Banggai Regency. The subjects for testing the instrument were 21 class V students at SDN 3 Luwuk and the subjects for research activities were 25 class V students at SD Inpres 9 Luwuk. This school was chosen as the research subject because it represents a school that develops digital-based learning and local wisdom of the Kaili language as local content subjects. Data collection techniques are observation, interviews, documentation and questionnaires. Observation activities are carried out to see directly the activities in the learning process.

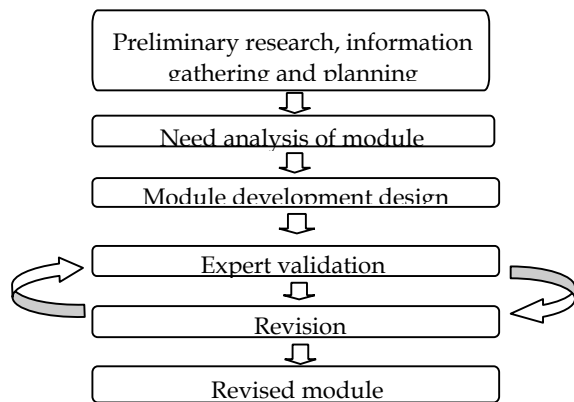


Figure 1. Model for Design Development of Hybrid Learning Virtual Space Modules Based on Local Language Wisdom in Science Subjects for Class V Elementary School Students. (Adapted from Borg & Gall 2007)

The research data is in the form of responses from media experts, material experts, teachers and students regarding the feasibility of the module being developed in terms of media, material, content and function aspects of the module. Data in the form of comments, suggestions for improvement and the results of researchers' observations during the testing process were analyzed descriptively and concluded as input for improving or revising the module that had been developed.

Result and Discussion

Introduction and Needs Analysis

The module needs analysis stage was carried out after the preliminary stage as a pre-survey step at SD Negeri 3 Luwuk. Based on the results of observations

and interviews with class V teachers and the Principal, it was identified that there were student needs related to the Design of Hybrid Learning Virtual Space Modules, science learning, and local content lessons in the form of regional languages, especially Saluan.

After the data is collected, the next step is to prepare a plan related to competency standards. These competency standards reflect the skills that students are expected to master and are the starting point for planning learning. The next stage involves identification to determine the appropriate module title, taking into account the achievement of basic competencies and the coverage of subject matter according to the 2013 curriculum that applies at the school.

In this series, observation analysis, literature review, and identification results show that in theme 1, sub-theme 1, there is potential for developing student modules using the Hybrid Learning Virtual Space Module Design which is based on the local wisdom of the Saluan language in the context of science learning for fifth grade students. in elementary school. The designed module will be in line with the achievement of basic competencies (KD) in theme 1 sub theme 1 in class V, by focusing on developing knowledge, skills and attitudes that are in line with the basic competencies in the applicable 2013 curriculum syllabus.

Module Development Design

After carrying out an analysis of the design of the Hybrid Learning Virtual Space Module, aspects of the local wisdom of the Saluan language, as well as science learning materials adapted for elementary school students, through a combination of literature study and field observations, all data collected was used as the main reference in the process of developing Module. This stage is a series of processes for creating Virtual Space modules which aims to produce modules that meet expectations.

In the construction of the Hybrid Learning Virtual Space learning module, designed to intertwine the local wisdom of the Saluan language with science learning for fifth-grade students in elementary schools, a meticulous arrangement of components has been established to support the educational framework of this research. The format of these components begins with a title page containing information about "Design of Hybrid Learning Virtual Space Modules Based on Local Wisdom in Saluan Language in Science Subjects for Class V Students," displays the visual appearance of the Hybrid Learning Virtual Space Platform as well as an Android application which contains elements of local wisdom Saluan culture as a visual identity for elementary school students, mentioning the author's name, as well as the name of the school agency. Following the title page, a Foreword containing the

author's expression of gratitude. The next section, Table of Contents, namely this page lists all the components contained in the module along with relevant page references. The subsequent section on Basic Competencies explained in the process of compiling indicators and modules according to the 2013 curriculum. The basic competency table in the 2013 curriculum contains integrated thematic.

Expert Validation

The module to be developed is validated by two experts, namely media and material experts. If the results of validation by media and materials experts state that the media that has been created is suitable for field testing, then the researcher then carries out a module trial. The trials will be carried out in stages, starting from limited trials and field trials. Assessment by material experts is carried out by reviewing the Self Instruction, Self Contained, Stand Alone, Adaptive and User Friendly aspects. The results of the instrument in the form of assessments, comments, observations and suggestions are analyzed to revise the media. The results of the module eligibility criteria by material experts after being converted into eligibility percentages were obtained as in Table 1.

Table 1. Eligibility Criteria for Material Experts

Aspect	Analysis	Validator	Eligibility Criteria
Self Instruction	Σ score \bar{x}	5375 95.83	Very feasible
Self Contained	Σ score \bar{x}	300 100	Very feasible
Stand Alone	Σ score \bar{x}	300 100	Very feasible
Adaptive	Σ score \bar{x}	275 91.67	Very feasible
User Friendly	Σ score \bar{x}	400 100	Very feasible

The results of the assessment by media experts were carried out by reviewing aspects of writing format, material, organization, attractiveness, letter shape and size, space, and consistency. The results of the instrument in the form of assessments, comments,

observations and suggestions analyzed for revising the media can be seen in Table 2. Results of the module eligibility criteria by media experts after conversion:

Table 2. Media Expert Eligibility Criteria

Aspect	Analysis	Validator	Eligibility Criteria
Writing format	Σ score \bar{x}	225 75	Feasible
Material	Σ score \bar{x}	450 90	Very feasible
Organization	Σ score \bar{x}	275 68.75	Feasible
Attractiveness	Σ score \bar{x}	225 75	Feasible
Space (blank space)	Σ score \bar{x}	400 80	Feasible
Consistency	Σ score \bar{x}	275 91.67	Very feasible

a. Results of teacher responses

The results of the teacher's response to the feasibility test at SD Inpres 9 Luwuk for 2 (two) class V teachers are as follows (Table 3).

Table 3. Results of Teacher Responses to the Limited Feasibility Trial

Aspect	Analysis	Respondents
Media	Σ score \bar{x} (average) Criteria	12 3 Good
Aspect Material	Analysis Σ score \bar{x} (average) Criteria	Respondents 12 4 Very good
Aspect Module Learning	Analysis Σ score \bar{x} (average) Criteria	Respondents 9 3 Very good

b. Results of student responses

Results of class V students' responses to the module feasibility trial at SDN 3 Luwuk with a total of 21 students as respondents.

Table 4. Results of Student Responses to the Limited Module Feasibility Test

Respondent's Name	Questionnaire Items									
	1	2	3	4	5	6	7	8	9	10
S1	1	1	1	1	1	1	1	1	1	1
S2	1	1	1	1	1	1	0	1	1	1
...	1	1	1	1	1	1	1	1	1	1
Total	24	24	24	22	18	23	19	22	22	24
Score	100	100	100	91.67	75	95.83	79.17	91.67	91.67	100
Category	Very good	Very good	Very good	Very good	Good	Very good	Good	Very good	Very good	Very good

Field Test Results

a. Results of teacher responses

The results of the teacher's response to the field test regarding the feasibility of the module at SDN 3 Luwuk against 1 (one) class V teacher are as follows (Table 5).

Table 5. Results of Teacher Responses to the Feasibility of the Module in the Field Test

Aspect	Analysis	Respondents
Media	Σ score	12
	\bar{x} (average)	3
	Criteria	Good
Aspect Material	Analysis	Respondents
	Σ score	12
	\bar{x} (average)	4
Aspect Module Learning	Analysis	Respondents
	Σ score	9
	\bar{x} (average)	3
	Criteria	Very good

b. Results of student responses

The results of class V students' responses to the field test on module feasibility at SDN 3 Luwuk with a total of 24 students as respondents are shown in Table 6.

Table 6. Results of Student Responses in Field Tests on Module Feasibility

Respondent's Name	Questionnaire Items									
	1	2	3	4	5	6	7	8	9	10
S1	1	1	1	1	1	1	1	1	1	1
S2	1	1	1	1	1	1	0	1	1	1
...	1	1	1	1	1	1	1	1	1	1
Total	24	24	24	22	18	23	19	22	22	24
Score	100	100	100	91.67	75	95.83	79.17	91.67	91.67	100
Category	Very good	Very good	Very good	Very good	Good	Very good	Good	Very good	Very good	Very good

Results of Class Observations on Field Test Activities

The results of observations of learning activities using modules in class V SDN 3 Luwuk can be seen in Table 7.

Table 7. Observation Results for Class V at SD Negeri 3 Palu

Observation Category	Score			
	4	3	2	1
Students' enthusiasm during teacher appreciation activities	✓			
Students' attention when the teacher delivers material	✓			
Students' activity in reading the module	✓			
Students' interaction in discussing with groups using modules	✓			
Orderliness while following the learning process		✓		
Display of student performance result in groups with the help of modules	✓			
Do the questions in the module	✓			
Score $\frac{27}{28} \times 100 = 96.4$ (very good)				

Revision of Hybrid Learning Module Design

Improvements to the design of the hybrid learning platform which is used as a home for presenting modules were carried out after corrections from media

experts and material experts as well as evaluation results at the module feasibility test stage based on limited module feasibility trials and field trials. Several views of the module were changed according to suggestions from

material and media experts as shown on the module cover before and after validation was carried out as shown as follows:

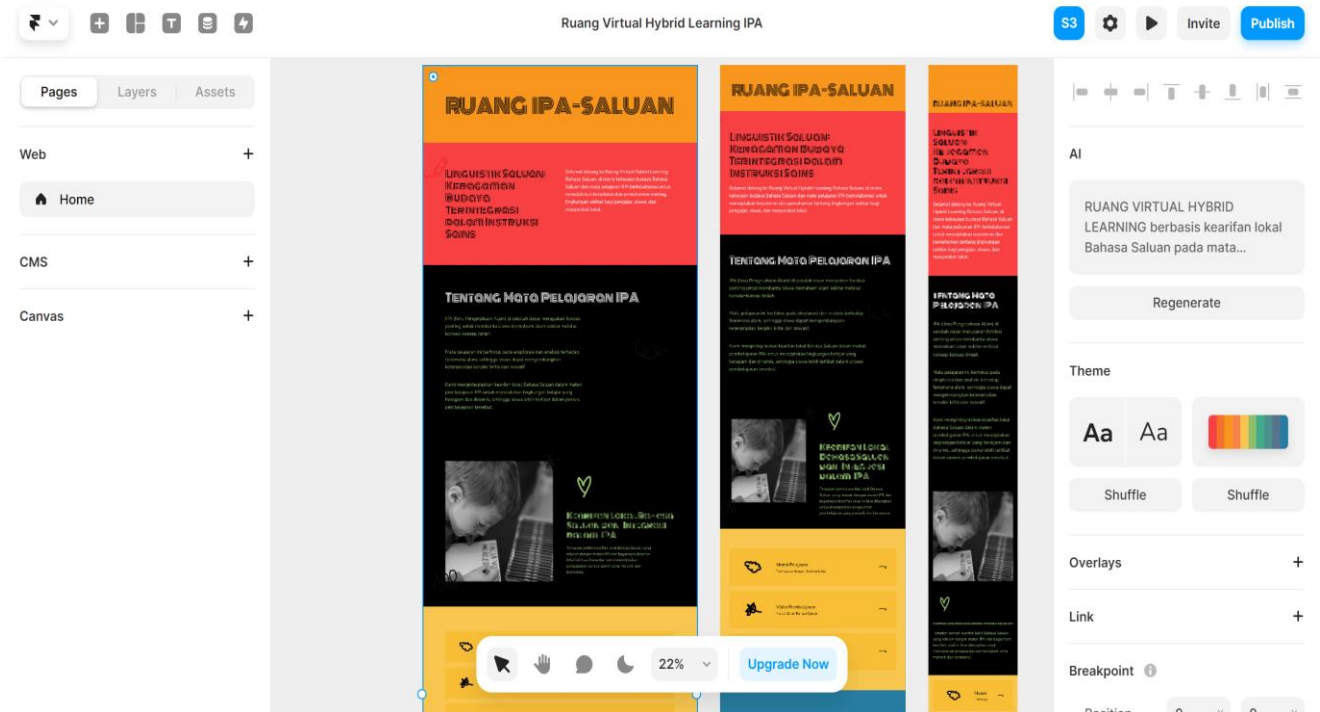


Figure 2. (a) View of the hybrid learning platform design before validation

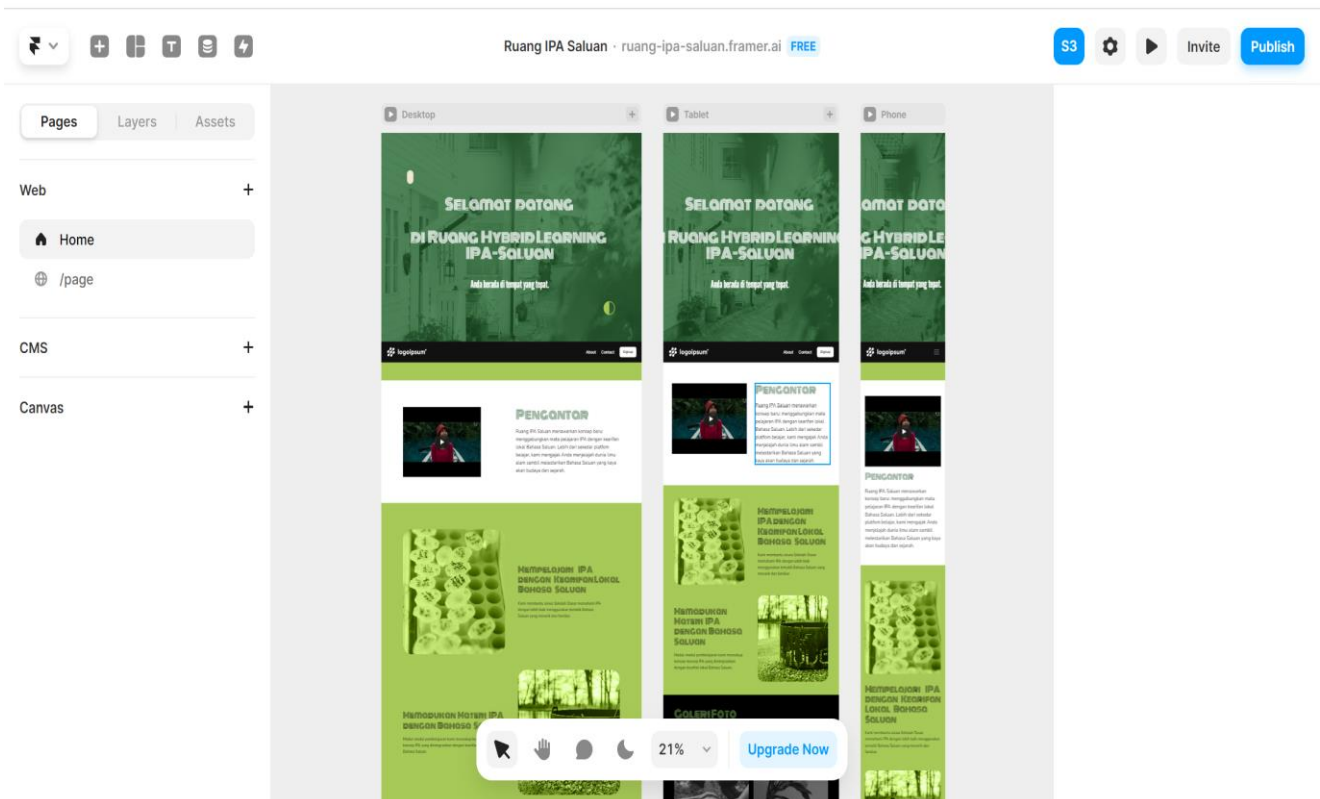


Figure 2. (b) Display of the hybrid learning platform design after validation

Some of the views of the module were changed according to suggestions from material and media

experts as shown on the module cover before and after validation was carried out as shown as follows:



Figure 3. (a) Cover display before validation and (b) Cover display after validation

Based on the results of the evaluation by material experts on the module, overall the presentation of the material is very good, including the appropriateness of the material in the module in terms of aspects self instruction value 3.83 or "very feasible" criteria, aspect self contained value 4 or "very feasible" criteria, stand alone value 4 or "very feasible" criteria, adaptive worth 3.75 or "very feasible" criteria and user friendly value 4 or "very feasible" criteria. This is also supported by the responses given by material experts that overall "The module is easy to understand and interesting for elementary school students". Therefore, the material in the module based on the validation results of material experts is declared valid and suitable for limited testing and field testing to determine user responses (*user*) against the use of the module.

The validation results by media experts stated that the display in the module was good and suitable for use in field tests. This can be seen from the results of material validation against the writing format aspect with a score of 3 or 'good' criteria, the material aspect with a score of 3.6 or "very good" criteria, the organizational aspect with a score of 2.75 or "good" criteria, the aspect of the shape and size of the letters scoring 3 or "good" criteria, the space aspect is worth 3.2 or "very good" criteria and the consistency aspect is worth 3.67 or "very good" criteria.

Therefore, based on the assessment and criteria produced by validation, the material is good and suitable to proceed to the limited trial and field test stages. This is supported by the statement provided by the media validation results that "This module is excellent in terms of image layout and material coverage. "Apart from that, this module also increases students' interest in learning through the use of the Hybrid Learning Virtual Space Module which includes a digital comic design application as well as learning the Saluan language which is easy for students to use." The results of the module feasibility conversion based on validation by material experts and media experts can be concluded that the media in the module is suitable for use.

A limited trial was carried out at SDN 3 Luwuk with 21 students and 2 (two) class V teachers. The results of the trial using the module produced an average response of 2 (two) teachers to the media aspect of 3.125 or the "very good" category, the material aspect has a score of 3 or the "good" category and the learning aspect of the module has a score of 3 or the "good" category. This shows that in general the material and media in the module are good or suitable for use in class. Teacher response to the module: "Learning uses the Hybrid Learning Virtual Space platform which provides digital learning modules for science material and image design

applications, making students more active and happy "Student responses in the limited trial were based on the results of a questionnaire which was then analyzed qualitatively regarding aspects of students' needs for using the module with a score of 81.70 or the "good" category. The aspect of students' interest in the appearance of the module received a score of 87.3 or the "category" very good" and the aspect of students' needs regarding broad knowledge about the material in the module obtained a score of 92.07 or the "very good" category.

The need and interest of students in using modules and technology to study science material is very good. This statement is also supported by the results of observations which show that when students learn using the module they are very enthusiastic, there is interaction between fellow students and teachers and they are able to collaborate, communicate and create with full curiosity and are able to produce works in the form of comics. According to Ismail (2018), visual design is a form of communication that uses visual elements such as images, colors and layout to convey messages. Visual design can be applied to various fields, including learning. According to (Kustandi et al., 2021), visual design in learning is the use of visual elements to help students understand concepts or subject matter more easily and interestingly. Visual design can also help students to build deeper understanding through the use of supporting images or graphics. In a learning context, visual design can be applied in various forms, such as presentations, posters, textbooks and learning videos. The visual design in the form of learning videos was found to be effective in increasing students' understanding and interest in the lesson material (Parlindungan et al., 2010).

Based on the results of field tests at SD Inpres 9 Luwuk in class V regarding the use of the module, user responses were obtained Very good. The results of the teacher's response showed that the media aspect received a score of 3 or the "good" category, the material aspect received a score of 4 or the "very good" category and the module use aspect scored 3 or the "good" category. This statement is supported by the results of interviews with class V teachers regarding the use of modules in accordance with the 2013 curriculum which contains integrated thematic.

Teacher respondent: ".. "I looked at and read the module, and found that the module was very appropriate to the science subject, especially in theme one which discusses the organs of movement and the body's skeleton. This is in accordance with the material we are studying. "The local wisdom in the form of regional languages is contained in the module in accordance with the mulok content lessons at the school by integrating digital technology according to the skills of 21st century students, namely

utilizing technology in learning. According to Suwito (2018), regional languages have an important role in education because they can be a medium for introducing regional culture and increasing feelings of love for students' home regions. Apart from that, the use of regional languages can also help students who have difficulty understanding material in Indonesian. This is in line with the results of research conducted by Gultom (2019) which shows that the use of regional languages in learning can increase students' understanding of subject matter and increase students' learning motivation. The use of regional languages can also help students who have difficulty understanding material in Indonesian.

The results of teacher respondent interviews are as follows:

Teacher respondent: "... "The science material linked to the Saluan language by SBdP includes concepts that have been applied previously. For example, if in the science material there is a discussion about the organs of movement, moving activities are also part of the science material. Children can create a comic that involves the activity "movements are appropriate to the science material. In the comic, there are dialogues that can use Saluan language. Thus, the visual images and activities displayed in the comic are in accordance with the movement activities taught in the science content."

The students' responses in the field test regarding the use of the module in the aspect of students' needs for the use of the Hybrid Learning Virtual Space learning module based on local saluan language wisdom in science learning was scored 90.6 or the "very good" category. The aspect of students' interest in the appearance of the hybrid learning module based on local wisdom in the Saluan language in natural science learning was scored 93.6 or in the "very good" category and the aspect of students' needs regarding extensive knowledge about learning digital comic design based on local wisdom of the Saluan language in natural science learning was worth 94.4 or "very good" category. Analysis of student needs for the module can be seen in Figure 4.

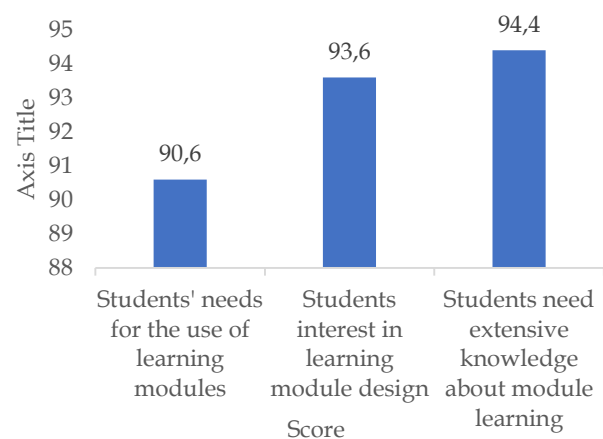


Figure 4. Graph of Student Needs Level for Modules Based on Field Test Results

This shows that in general students' needs and interest in the material and media in the module are very good. From the results of observations, students' interest in using the module was seen to be very enthusiastic,

where students in the group were able to develop communication skills, creativity, understanding of material and digital abilities. Some of the works of the Hybrid Learning Virtual Space based on the local wisdom of the Saluan regional language in science learning are as follows:

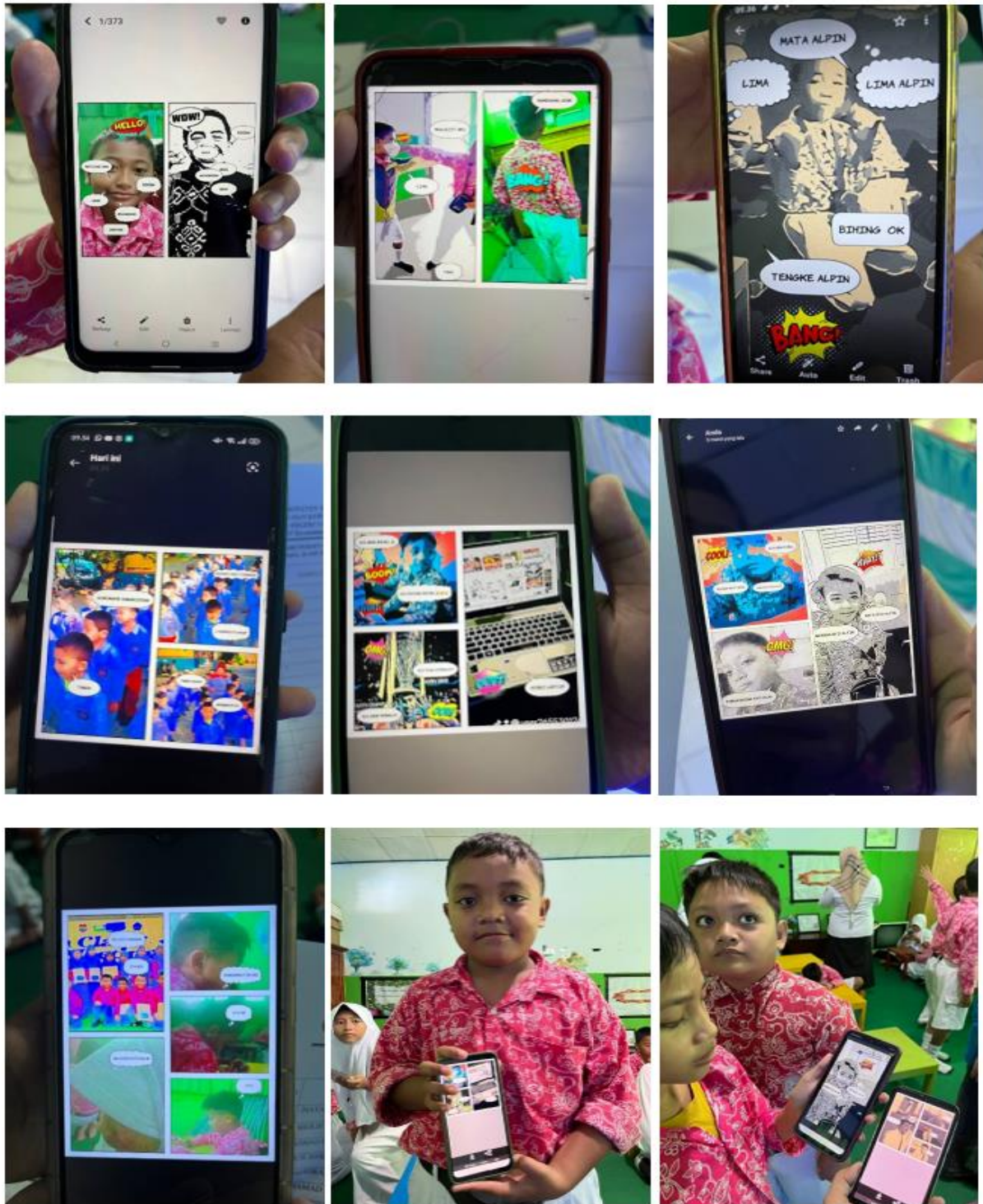


Figure 5. Results of Hybrid Learning Virtual Space Design Based on Local Saluan Language Wisdom in Science Subjects for Class V Elementary School

Conclusion

Based on the research conducted, it can be concluded that, First, the process of developing the Hybrid Learning Virtual Space module is carried out through five stages, namely: a) analyzing the product to be developed, b) developing the initial product, c) validating it by experts, d) testing try the product, and e) revise the product. Second, the results of validation and feasibility trials by material experts, media experts and users show that the Hybrid Learning Virtual Space module is suitable for use and can be expanded in use in elementary schools. This module is considered feasible from various aspects, including media, material, content and function of the module that has been developed. Third, students' positive response to the use of the Hybrid Learning Virtual Space module, which is based on local Saluan language wisdom in science learning, indicates that this module is able to meet students' needs and interests in the material and media contained in the module. This module has also been proven to be able to stimulate students' enthusiasm for learning, encourage good collaboration in groups, and develop communication skills, creativity, understanding of material, digital skills, and awareness of the local wisdom of the Saluan regional language.

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Author Contributions

This research contributes to the development of a Hybrid Learning Virtual Space as well as digital-based learning media based on local wisdom that can be used by teachers in elementary schools. The author was involved in the entire creation of this article.

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Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

References

- Almarabeh, H., Amer, E. F., & Sulieman, A. (2015). The effectiveness of multimedia learning tools in education. *International Journal of Advanced Research in Computer Science and Software Engineering*, 5(12), 761-764.
- Bliuc, A. M., Goodyear, P., & Ellis, R. A. (2007). Research focus and methodological choices in studies into students' experiences of blended learning in higher education. *Internet and Higher Education*, 10(4), 231-244. <https://doi.org/10.1016/j.iheduc.2007.08.001>
- Borg, W. R., & Gall, M. D. (2007). *Educational Research: An Introduction*. London: Pearson Education.
- Budiarta, W. (2023). Integrasi kearifan lokal mulat sarira dalam pembelajaran sejarah. *Jurnal Ikatan Keluarga Alumni Undiksha*, 21(1), 1-7. <https://doi.org/10.23887/ika.v>
- Dwiyoga, W. D. (2004). *Pengembangan modul*. Surabaya: Unesa University Press.
- Fitriah, L., & Ita, I. (2022). Development of biophy magazine containing local wisdom to improve problem solving ability and promote environmental awareness campaign. *Jurnal Penelitian Pendidikan IPA*, 8(3), 1061-1073. <https://doi.org/10.29303/jppipa.v8i3.1275>
- Gultom, R. (2019). Meningkatkan motivasi belajar melalui penggunaan bahasa daerah dalam pembelajaran. *Jurnal Pendidikan Karakter*, 9(1), 1-8.
- Haetami, H. (2023). Analysis hybrid learning on learning motivation students and mental disorders as moderator variables during covid-19. *Jurnal Penelitian Pendidikan IPA*, 9(8), 6648-6658. <https://doi.org/10.29303/jppipa.v9i8.4847>
- Hasanudin, C., Subyantoro, S., Zulaeha, I., & Pristiwati, R. (2021). Strategi menyusun bahan ajar inovatif berbasis mobile learning untuk pembelajaran mata kuliah keterampilan menulis di abad 21. *Prosiding Seminar Nasional Pascasarjana, Pascasarjana Universitas Negeri Semarang*, 343-347.
- Husnaini, Nurhikmah H, Muin, A., Hakim, A., & Pataufi. (2023). Development of teaching materials based on augmented reality (ar) in science subjects at min 1 kolaka utara students. *Auladuna: Jurnal Pendidikan Dasar Islam*, 10(2), 224-232. <https://doi.org/10.24252/auladuna.v10i2a8.2023>
- Ismail, I. (2018). *Pengantar Desain Grafis*. Jakarta: Erlangga.
- Jamaluddin, J., Mustami, M. K., Ismail, M. I., & Mania, S. (2022). Pengaruh pemanfaatan bahan ajar berbasis tik dan bahan cetak terhadap motivasi belajar pada mata pelajaran aqidah akhlak di MAN 1 sinjai. *Edukasi Islami: Jurnal Pendidikan Islam*, 11(01), 621. <https://doi.org/10.30868/ei.v11i01.1956>
- Jannah, I. N., Hariyanti, D. P. D., & Prasetyo, S. P. (2020). Efektivitas penggunaan multimedia dalam pembelajaran ipa di SD. *Jurnal Ilmiah Sekolah Dasar*, 4(1), 54-59.
- Kartodirdjo, S. (2000). *Pendekatan Sejarah Kebudayaan: Suatu Pengantar*. Jakarta: Penerbit Yayasan Obor Indonesia.

- Kustandi, C., Farhan, M., Zianadezdha, A., Fitri, A. K., & L, N. A. (2021). Pemanfaatan media visual dalam tercapainya tujuan pembelajaran. *Akademika*, 10(02), 291–299. <https://doi.org/10.34005/akademika.v10i02.140>
- LaViola Jr., J. J. (2017). *Virtual reality: In The Wiley Handbook of Human Computer Interaction Set* (pp. 1–19). New Jersey: Wiley.
- Li, X., Dong, C., & Wu, Y. (2019). Exploring the adoption of virtual reality in k-12 education: a synthesis of literature. *Journal of Educational Technology Development and Exchange*, 12(1), 1–14. h
- Mahnun. (2012). *Strategi Pembelajaran*. Bandung: PT. Remaja Rosdakarya.
- Megalina, Y., Rugaya, R., Hutahaeen, J., & Lubis, R. H. (2023). Development of hybrid learning multimedia assisted by telegram in modern physics. *Jurnal Penelitian Pendidikan IPA*, 9(10), 9071–9077. <https://doi.org/10.29303/jppipa.v9i10.5561>
- Mu'aziyah, S. E. S., & Isnawati. (2023). Curriculum change vs changes in the field: how contextual is learning in the merdeka curriculum? *Equator Science Journal*, 1(2), 73–79. <https://doi.org/10.61142/esj.v1i2.34>
- Parlindungan, D. P., Mahardika, P. G., & Yulinar, D. (2010). Efektivitas media pembelajaran berbasis video pembelajaran dalam pembelajaran jarak jauh (pjj) di SD islam an-nuriyah. *Prosiding Seminar Nasional Penelitian LPPM UMJ*, 167–175.
- Puspitasari, A. D. (2019). Penerapan media pembelajaran fisika menggunakan modul cetak dan modul elektronik pada siswa SMA. *Jurnal Pendidikan Fisika*, 7(1), 2355–5785.
- Ronaldo, E., & Aslimeri. (2020). Pengembangan modul pembelajaran dasar listrik dan elektronika berbasis course review horay. *Jurnal Pendidikan Teknik Elektro*, 01(01), 156–159.
- Sagala, S. (2017). *Konsep dan Pengembangan Modul*. Bandung: PT. Refika Aditama.
- Septikasari, R., & Frasandy, R. N. (2018). Keterampilan 4c abad 21 dalam pembelajaran pendidikan dasar. *Jurnal Tarbiyah Al-Awlad*, 8(02), 112–122.
- Sumandiyar, A., Husain, Muh. N., Sumule G, M., Nanda, I., & Fachruddin, S. (2021). The effectiveness of hybrid learning as instructional media amid the covid-19 pandemic. *Jurnal Studi Komunikasi (Indonesian Journal of Communications Studies)*, 5(3), 651–664. <https://doi.org/10.25139/jsk.v5i3.3850>
- Supriyadi, Palittin, I. D., & Kumala Sari, D. (2020). Concept of sound in tifa as papua's contextual learning media. *Advances in Social Science, Education and Humanities Research*, 394, 391–396.
- Supriyadi, Waremra, R. S., & Betaubun, P. (2019). Papua contextual science curriculum contains with indigenous science (ethnopedagogy study at malind tribe merauke). *International Journal of Civil Engineering and Technology*, 10, 10–12.
- Suwito. (2018). *Pendidikan dan Bahasa Daerah*. Kementerian Pendidikan dan Kebudayaan. Diambil dari <https://buku.kemdikbud.go.id/id/buku/pendidikan-dan-bahasa-daerah>
- Suyanto, E. (2017). Pengembangan pembelajaran ipa di sekolah dasar. *Jurnal Pendidikan Dasar*, 18(1), 33–40. <https://doi.org/10.17509/jpd.v1i1.6464>
- Yuendita, D., & Dina, D. (2024). Development of chemical literacy book on local wisdom of madura culture based on augmented reality (AR). *Jurnal Penelitian Pendidikan IPA*, 10(1), 346–359. <https://doi.org/10.29303/jppipa.v10i1.5689>
- Zainudin, Hermanto, D., Wijayanti, R., & Hunaepi. (2023). Effectiveness of the combination of problem-based learning models and hybrid learning models to improve problem solving skills. *Jurnal Penelitian Pendidikan IPA*, 9(12), 11648–11654. <https://doi.org/10.29303/jppipa.v9i12.4740>