Received : 13 September 2023
Revised : 28 December 2023
Accepted : 29 December 2023
Online : 31 December 2023
Published: 31 December 2023

DOI: doi.org/10.21009/1.09210

Development of Guided Inquiry based on Blended Learning (GIbBL) Teaching Module for Physics in the Independent Curriculum

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Abstract

This study aims to develop a teaching module with a guided inquiry model based on blended learning (GIbBL) that can be applied in the independent curriculum. This kind of research uses the ADDIE development paradigm, which consists of the following steps: 1) Analysis, 2) Design, (3) Development, 4) Implementation, and 5) Evaluation. Due to time constraints, the teaching module in this study was only develop to the development stage. The feasibility of the teaching modules was assessed through expert validation tests and practicality tests, which involved gathering responses from research subjects. The subjects of this study were physics teachers and students of class XI SMAN 7 Banda Aceh. The data collection technique employed in this study utilized a questionnaire instrument, comprising a material and learning design expert validation questionnaire, as well as a teacher and student response questionnaire. Data analysis involved percentage descriptive analysis. The results of the material expert validation test demonstrated a percentage of 93,25%, while the learning design expert validation test yielded 91,5%, both falling within the "very valid" category. Furthermore, the teacher response test resulted in a percentage of 96,2%, and the student response test amounted to 88%, both categorized as "very good." Based on the research findings, it can be concluded that the guided inquiry based on blended learning (GIbBL) teaching module is deemed feasible for application in the learning process within an independent curriculum.

Keywords: blended learning, guided inquiry, teaching module development

INTRODUCTION

The change in curriculum to an independent curriculum has several impacts on the world of education. One of the most prominent changes from this independent curriculum is the format for making lesson plans. In the independent curriculum, lesson plans are now known as teaching modules (Maulida 2022). Teaching modules are one of the learning plans that have been arranged systematically and completely based on the learning topics being studied in order to achieve learning objectives (Sigalingging 2022). In developing teaching modules in the independent curriculum, teachers have the

freedom to develop them according to their learning environment and conditions. There are several components in the teaching module including general information, core competencies, and attachments (Hartoyo, A and Rahmadayanti, D 2022).

In addition to the change in lesson plans to teaching modules, the demands of the independent curriculum which are oriented towards differentiated learning are also one of the changes that occur in the learning process. Based on the results of the needs analysis in the field, it was found that the changes in the independent curriculum caused teachers to have difficulty in overcoming problems related to time constraints. This is because the time available at school is not commensurate with the many responsibilities that must be completed by teachers in this era of curriculum change. A lot of material with a short learning time at school, limited discussion time with a large number of students causes teachers to have difficulty in implementing differentiated learning in the independent curriculum (Minarti, IB et al. 2023). Teachers are still in the process of adapting to the change from the K13 curriculum to the independent curriculum, so they still have difficulty in managing the tempo of learning to be more effective (Sasmita, E and Darmansyah, D 2022; Wantiana, I and Mellisa, M 2023). Therefore, a solution is needed to maximize the learning process by considering the limited learning time at school. One solution that can be used is to use a blended learning approach in the learning process.

The blended learning approach is a learning process that combines face-to-face learning and online learning (Herliana, F et al. 2021). By combining face-to-face and online learning processes, it can increase time effectiveness, cost efficiency and attractiveness in a diverse learning environment (Verawati and Desprayoga 2019). Therefore, the blended learning approach is very suitable to overcome problems related to time constraints during the teaching and learning process and can minimize the shortcomings of face-to-face learning (Rahmi, U and Azrul 2022). However, the blended learning approach also has several disadvantages, such as the lack of control over the learning process of students when outside the classroom (online) (Yustina and Putra, RA 2022). Therefore, a model that can control learning both inside and outside the classroom is needed.

Physics subject matter involves complex relationships between various concepts. Understanding of physics concepts can be formed through exploration and experimentation (Hilarius, JD and Herawati, S 2019). Learning models that are able to encourage students to actively engage in exploration in the form of experiments, discussions, and investigations are needed so that students can build physics concepts in a deeper way (Syukri, M et al. 2022). The guided inquiry learning model is a model that gives students the freedom to solve problems but still under the guidance of the teacher so that the learning process can still be controlled (Jusman et al. 2020). There are 6 steps in the guided inquiry learning model, namely 1) formulating problems, 2) formulating hypotheses, 3) designing experiments, 4) conducting experiments, 5) processing and analyzing data, and 6) making conclusions (Lovisia 2018). The stages of this model can be applied by teachers both synchronously and asynchronously with full guidance in both learning environments which can be referred to as Guided Inquiry based on Blended Learning (GIbBL). In previous research, the Guided Inquiry based on Blended Learning model was proven to improve students' critical thinking and Metacognitive skills (Saekawati, R and Nasrudin, H 2021; Afifah, UN and Azizah, U 2021). This is expected to be a solution to the limited learning time experienced during the adaptation process with the current curriculum changes so that the physics learning process can run effectively and efficiently.

In the implementation of Guided Inquiry based on Blended Learning (GIbBL), there are many things that teachers need to prepare so that the learning objectives can be achieved. Things that need to be designed before implementing the learning process in the independent curriculum include teaching modules, learning materials, learning videos, etc. (Hanifah, N and Djuanda, D 2023). Teaching module is a tool or means, media, methods, instructions, and guidelines that are systematically and interestingly designed (Rahimah 2022). This teaching module is one of the important learning tools designed in the independent curriculum in order to optimize the participation of students in the learning process so that the learning process becomes effective and efficient. Formulated by the Education Development Agency of the Ministry of Education and Culture states, "the teaching module is a unit of the smallest teaching and learning program which very detailed states the following: a) general instructional objectives that will be supported by their achievement; b) topics that will be used as the basis for the teaching and learning process; c) specific instructional objectives

to be achieved by students; d) the main material to be studied and taught; e) the position and function of the unit (module) in a broader program unit; f) the role of the educator in the teaching and learning process; g) tools and sources that will be used; h) learning activities that students must do and live in sequence; i) work sheets that students must fill out; j) evaluation programs that students will carry out during the learning process (Kosasih 2021). In line with what is formulated by the Education Development Agency of the Ministry of Education and Culture, this teaching module also contains worksheets that must be filled in by students, so that there needs to be harmony between the plan designed by the teacher and the worksheets done by students.

Based on the description above, so that the physics learning process in the implementation of the current independent curriculum can run effectively and efficiently and teacher constraints related to limited time in carrying out the teaching and learning process can be overcome, it is necessary to develop physics learning tools called teaching modules using the Guided Inquiry based on Blended Learning (GIbBL) model.

METHODS

This development research uses the ADDIE model which consists of 5 stages, namely Analysis, Design, Development, Implementation, and Evaluation. In this study, the teaching module was only developed until the development stage due to time constraints. At the analysis stage, researchers conducted a needs analysis, curriculum analysis, and teaching module analysis. This analysis was conducted through interviews with physics teachers at SMAN 7 Banda Aceh, observation, document analysis, and literature review. At the design stage, researchers designed teaching modules using the Guided Inquiry based on Blended Learning (GIbBL) model. Furthermore, at the development stage, researchers carried out development related to teaching modules using the Guided Inquiry based on Blended Learning (GIbBL) model and tested the feasibility of teaching modules through product validity tests by experts (material and learning design experts) and pilot tests on students and teachers.

The data collection technique in this study used a questionnaire instrument in the form of a product feasibility validation questionnaire given to material and learning design experts, as well as a questionnaire for teacher and student responses to the Guided Inquiry based on Blended Learning (GIbBL) teaching module that had been developed. The product validation questionnaire instrument by material experts consists of 3 aspects, namely content feasibility, language feasibility, and presentation (Rachmawati et al. 2019), while the product validation questionnaire instrument by learning design experts consists of 2 aspects, namely aspects of teaching modules and worksheet aspects (Rohyatun 2017). The teacher response questionnaire instrument consists of 3 aspects, namely material, teaching modules, and worksheet, and the student response questionnaire consists of 2 aspects, namely convenience and helpfulness (Rohyatun 2017). The subjects of this study were physics teachers and students of class XI at SMAN 7 Banda Aceh. Data analysis techniques in this study used quantitative descriptive analysis techniques. To determine the feasibility of Physics teaching modules using the Guided Inquiry based on Blended Learning (GIbBL) model, expert validation results were analyzed using a percentage (Sudijono 2011) with the following equation.

$$P = \frac{\text{Total score of each item}}{\text{Maximal score}} \times 100\%$$

After obtaining the research data, it is then interpreted into the TABLE 1 validity criteria (Arikunto 2010).

TABLE 1. Teaching Module Validity Level Criteria

Feasibility Percentage	Citeria
$01.00\% < P \leq 50.00\%$	Not Valid (NV)
$50.01\% < P \leq 70.00\%$	Valid Enough (VE)
$70.01\% < P \leq 85.00\%$	Valid (V)
$85.01\% < P \leq 100.00\%$	Very Valid (VV)

Furthermore, a pilot test was conducted by giving a response questionnaire to teachers and students to test the practicality of using the Physics teaching module using the Guided Inquiry based on Blended

Learning (GIbBL) model. The assessment scores obtained were then analyzed using the following formula.

$$P = \frac{\text{Total score of each item}}{\text{Maximal score}} \times 100\%$$

After obtaining the research data, it is then interpreted into the TABLE 2 (Arikunto 2013).

TABEL 2. Teachers and Students Response Questionnaire Assessment Score Criteria

Achievement Level (%)	Assessment Category
0-21	Very Poor (VP)
21-40	Not Good (NG)
41-60	Fairly Good (FG)
61-80	Good (G)
81-100	Very good (VG)

The flow of this research in detail and clearly, can be seen in the FIGURE 1.

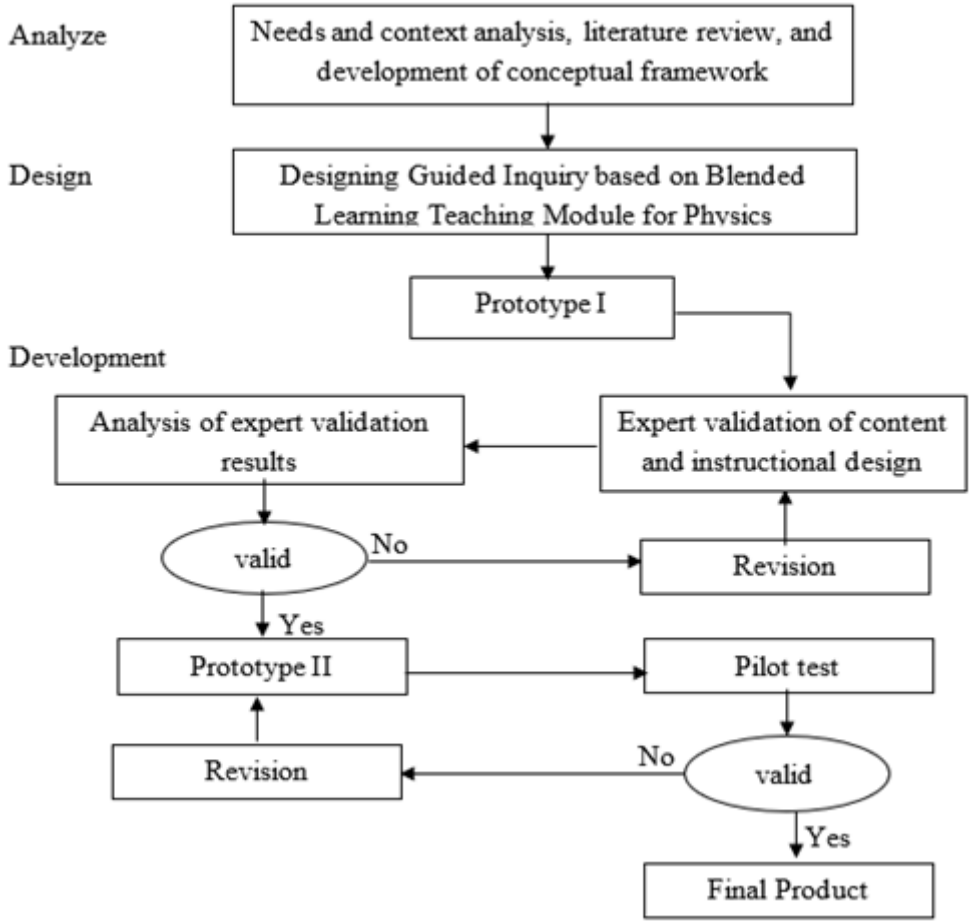

FIGURE 1. Research Flow

RESULTS AND DISCUSSION

This research was conducted through several stages, namely analysis, design, and development. At the analysis stage, curriculum analysis, teaching module analysis and needs analysis were carried out. In the curriculum analysis activity, it was found that SMAN 7 Banda Aceh had used the independent curriculum so that the learning process that took place also followed the applicable curriculum. Furthermore, in the analysis of teaching modules, it was found that the teaching modules that had been developed by teachers at SMAN 7 Banda Aceh had followed the independent curriculum guidelines, but were still generally online-based while the learning process that took place was face-to-face.

After analyzing the curriculum and analyzing the teaching module, a needs analysis was conducted. Based on the results of the needs analysis, it was found that the learning process still used conventional methods such as lectures and discussions. In fact, this conventional learning process is not in accordance with the demands of the curriculum where students are required to be more skilled so that they can compete with the times (Rawung et al. 2021). In addition, practicum activities in this school are also still fairly passive. After further interviewing, it turns out that the cause of the lack of practicum activities in the learning process is due to the limited time in the learning process, moreover, the physics material for class XI in the independent curriculum is quite a lot. According to the teacher who was the source in the interview, limited time in the learning process is a problem that often occurs and results in a less than optimal learning process, so an approach is needed that can be used so that the learning process is maximized even though the time in the learning process is quite limited.

An approach that can be used to overcome time constraints is the blended learning approach. This is because the blended learning approach is a suitable approach to handle learning needs effectively and efficiently by combining online learning and face-to-face learning processes (Ndaru Kukuh Masgumelar and Pinton Setya Mustafa 2021). Because during online learning teachers often have difficulty in coordinating students, a learning model is needed that can overcome these problems. In this study, researchers used a guided inquiry learning model to be a solution to the lack of coordination of students during online learning. Guided inquiry learning model is a model that gives freedom to students to solve problems but still under the guidance of the teacher so that the learning process can still be controlled (Jusman et al. 2020).

Furthermore, in the design stage, the preparation of the teaching module draft is carried out in accordance with the steps of the guided inquiry learning model based on blended learning. The preparation of the module is carried out based on the components in the teaching module, namely: 1) General Information, 2) Core Components, and 3) Appendix (Maulida 2022). This teaching module is arranged in accordance with the steps of guided inquiry using a blended learning approach. There are 6 steps in the guided inquiry learning model, namely 1) formulating problems, 2) formulating hypotheses, 3) designing experiments, 4) conducting experiments, 5) processing and analyzing data, and 6) making conclusions (Lovisia 2018). All stages of guided inquiry are integrated into synchronous and asynchronous learning environments (Blended Learning).

In the learning activities section, the initial phase of the guided inquiry model is formulating problems. In this phase, students are given photo and video illustrations of transverse waves and longitudinal waves that can be accessed both in class and outside school hours before learning in class. This section can be seen in FIGURE 2 and FIGURE 3.

Fase 1: Merumuskan Masalah		
1. Mengelompokkan peserta didik menjadi beberapa kelompok diskusi	1. Duduk secara berkelompok sesuai arahan guru	Sinkronous
2. Membagikan LKPD-2 kepada setiap kelompok	2. Menerima LKPD-2 yang telah dibagikan guru	
3. Menjelaskan materi efek doppler	3. Mendengarkan penjelasan dari guru	
4. Memberikan video mengenai efek doppler Link video : https://youtu.be/jpZvcuvvpW4	4. Mengamati video yang ditampilkan guru	
5. Memberikan pertanyaan untuk memancing peserta didik dalam merumuskan masalah Pertanyaan : - Bagaimana kondisi frekuensi bunyi pada video tersebut? Apakah selalu konstan?	5. Menjawab pertanyaan guru	
6. Meminta peserta didik untuk merumuskan permasalahan lainnya sesuai video di atas	6. Berdisukusi dengan teman sekelompok untuk merumuskan masalah	

FIGURE 2. Steps to Formulate Problems in Teaching Modules

FIGURE 3. Steps to Formulate Problems in Student Worksheet

In this section, students are given the freedom to watch illustrative videos related to wave material online anytime and anywhere, then the teacher will guide students to formulate problems from the videos they watch directly in the classroom (offline). In the step of formulating the problem, students with their groupmates will be asked to provide questions related to the video that has been watched so that it can be used as a problem formulation. Activities carried out by students in groups are a form of mutual cooperation from the Pancasila Student Profile (Rusnaini et al. 2021).

The next phase is to formulate a hypothesis. In this phase, students will be directed to make hypotheses (temporary conjectures) related to the formulation of problems that have been determined together beforehand (Lovisia 2018). The formulation of the hypothesis is written on the Student Worksheet which is prepared in accordance with the stages of the guided inquiry model so that students who have a slower learning speed than their other friends can carry out the learning process outside of school hours in accordance with the learning carried out in class with the help of this Student Worksheet. The part of formulating the hypothesis can be seen in FIGURE 4 and FIGURE 5.

Fase 2: Merumuskan Hipotesis		
1. Memandu peserta didik untuk merumuskan hipotesis berdasakan permasalahan yang telah didiskusikan peserta didik di kelompoknya masing-masing sebagai bentuk dari Profil Pelajar Pancasila bagian gotong royong	1. Merumuskan hipotesis berdasarkan permasalahan yang telah didiskusikan dibawah bimbingan guru	Sinkronous

FIGURE 4. Steps to Formulate Hypothesis in Teaching Module

FIGURE 5. Steps to Formulate Hypothesis in Student Worksheet

Then the next step is to design an experiment. In this step, students will be directed to design experiments by sequencing the steps that will be carried out during the experiment to answer the hypothesis (Lovisia 2018). This activity is carried out synchronously or directly face-to-face at the same time with the teacher so that students can design experiments with direct teacher guidance. The designing part of the experiment can be seen in FIGURE 6 and FIGURE 7.

Fase 3: Merancang Percobaan		
1. Mengarahkan peserta didik untuk merancang percobaan guna menjawab hipotesis yang telah ditetapkan	1. Merancang langkah-langkah percobaan untuk dilakukan sesuai dengan bimbingan guru	Sinkronous

FIGURE 6. Steps to Design an Experiment on the Teaching Module

FIGURE 7. Steps to Design an Experiment on the Student Worksheet

After designing the experiment, then learners with their groupmates will be directed to conduct experiments according to the steps determined in the experiment design process (Lovisia 2018). This activity can help learners to answer the hypothesis that has been determined. This activity can be carried out directly in the classroom or outside of school hours using various learning media that they can access on the internet through asynchronous teacher guidance. The part of conducting the experiment can be seen in FIGURE 8 and FIGURE 9.

Fase 4: Melakukan Percobaan		
1. Mengarahkan peserta didik untuk melakuka percobaan sesuai langkah-langkah yang telah ditentukan sebelumnya	1. Melakukan percobaan sesuai langkah-langkah yang telah ditentukan sebelumnya	Asinkronous

FIGURE 8. Steps to Perform Experiments in the Teaching Module

FIGURE 9. Steps to Perform Experiments in the Student Worksheet

The next step is to collect and analyze data. At this stage, students will be directed to collect data based on the results of the experiments that have been carried out and then analyzed to prove the previous hypothesis (Lovisia 2018). This activity is also a form of independence from the Pancasila Student Profile where students carry out and are responsible for the process and results that have been obtained (Rusnaini et al. 2021). The part of collecting and analyzing data can be seen in FIGURE 10 and FIGURE 11.

Fase 5: Mengumpulkan dan Menganalisis Data		
1. Mengarahkan peserta didik untuk mengumpulkan dan menganalisis data hasil pengamatan terhadap percobaan yang telah dilakukan sebagai bentuk dari Profil Pelajar Pancasila bagian kemandirian	1. Mengumpulkan dan menganalisis data hasil pengamatan terhadap percobaan yang telah dilakukan	Sinkronous
2. Mengarahkan peserta didik untuk menjawab pertanyaan di LKPD-2 sesuai dengan hasil percobaan	2. Menjawab pertanyaan di LKPD-2 sesuai dengan hasil percobaan	
3. Mengarahkan peserta didik untuk mempresentasikan hasil pengamatan terhadap percobaan yang telah dilakukan	3. Mempresentasikan hasil pengamatan terhadap percobaan yang telah dilakukan	
4. Mengarahkan peserta didik untuk mengumpulkan kembali LKPD-2	4. Mengumpulkan kembali LKPD-2	

FIGURE 10. Collecting and Analyzing Data on Teaching Modules

FIGURE 11. Collecting and Analyzing Data on Student Worksheet

The last step in the guided inquiry learning model is drawing conclusions. At this stage students will be asked to provide appropriate conclusions based on the results of the experiments that have been carried out. This conclusion drawing activity can be done online by sending answers through Google Classroom or Google Form that will be shared by the teacher. This activity can be followed up with presentation activities in class to equalize the perception of a physics concept obtained from the learning process. This Guided Inquiry based on Blended Learning (GIbBL) worksheet is equipped with an added insight section that contains links to videos, online animations, and other online media that can be accessed by students outside of school hours. Drawing conclusions and adding insights can be seen in FIGURE 12 and FIGURE 13.

Fase 6: Menarik Kesimpulan		
1. Meminta siswa untuk memberikan kesimpulan berdasarkan percobaan yang telah dilakukan guna menjawab hipotesis dan dikirimkan melalui G-Classroom atau G-Form	1. Memberikan kesimpulan berdasarkan percobaan yang telah dilakukan dan mengumpulkan LKPD-2 melalui G-Classroom atau G-Form	Asinkronous

FIGURE 12. Drawing Conclusions on the Teaching Module

FIGURE 13. Draw Conclusions on the Worksheet and the Add Insight Section

At the development stage, the teaching modules that have been developed are then validated by a team of material and learning design experts. This expert validation was carried out by 2 experts on each expertise. The data obtained from the validation results of material and construction experts can be seen in the TABLE 3.

TABLE 3. Material Expert Validation Results

No	Aspect	Percentage Score	Criteria
1	Content Appropriateness	93.5%	VV
2	Language Feasibility Aspect	94%	VV
3	Presentation Aspect	92.25%	VV
	Average Overall Percentage	93.25%	VV

The results of the material expert validation in TABLE 3 can be seen that all components in the teaching module are included in the very valid category with an overall percentage of 93.25% which is included in the very valid criteria. The lowest percentage in the material expert validation was in the presentation aspect with a percentage score of 92.25%. This score is included in the criteria very valid, but experts assess this teaching module has a lower consistency in the presentation part of learning activities than in the content of the material and the language used. For example, in the teaching module part of the learning material, the images presented for students to understand a material are less

appropriate so that it does not make it easier for students to understand the physics concepts being studied. Therefore, further improvement is needed regarding the selection of images to make it easier for students to understand the material. This is in accordance with (Maulani et al. 2022), which states that learning media can facilitate students' understanding of material so that effective learning is achieved.

TABLE 4. Learning Design Expert Validation Results

No	Aspect	Percentage Score	Criteria
1	Teaching module aspect	91.3%	VV
2	Aspects of LKPD	91.7%	VV
	Average Overall Percentage	91.5%	VV

Furthermore, the validation of learning design experts shows that all components in the teaching module are included in the very valid category with an overall percentage of 91.5%. The lowest percentage in the teaching module aspect is the formulation of objectives or indicators of 80%. The low percentage value on this indicator compared to other indicators is because the learning objectives compiled in the teaching module have not been sorted from easy to difficult because an effective learning process can be achieved based on objectives designed from low levels to higher levels in sequence (Ananda 2019).

After validation and revision according to the suggestions given by the validator, the GIbBL teaching module was then tested in pilot test on physics subject teachers and grade XI students at SMAN 7 Banda Aceh. Pilot tests are useful for evaluating teaching modules that have been developed so that they can then be implemented more widely (Alzaber, Suripah and Susanti 2021). The results of the Pilot tests through teacher responses can be seen in TABLE 5.

TABLE 5. Results Teacher Responses

No	Assessment Indicator	Percentage Score	Assessment Category
1	Presentation of material	96%	VG
2	Presentation of teaching modules	96.7%	VG
3	Presentation of LKPD	96%	VG
	Overall Average Percentage	96.2%	VG

Based on the results of the pilot test that has been carried out, the results of the teacher response questionnaire obtained a percentage of 96.2% and included in the very good category with the highest percentage in the teaching module presentation indicator of 96.7%, while the material presentation indicator and the Student Worksheet presentation obtained a slightly low score of 96%. The GIbBL teaching module has included general information, core components, and attachments so that it is in accordance with the independent curriculum (Maulida 2022). The GIbBL teaching module uses a guided inquiry learning model where the guided inquiry learning model is a model that gives students the freedom to learn but still under the guidance of the teacher, so that the learning process will remain controlled even though learning is done independently (Elsafayanti, Ahiri and Basri 2022). In addition, the GIbBL teaching module has also been equipped with Student Worksheet with the GIbBL model and relevant assessments to make it easier for teachers to carry out learning activities. The use of the guided inquiry learning model is indicated by the syntax of the guided inquiry learning model such as activities to formulate problems, formulate hypotheses, design experiments, conduct experiments, collect and analyze data, and make conclusions (Lovisia 2018). The learning stages arranged in the GIbBL teaching module have also been equipped with links to learning videos or animations that are relevant to the material and the use of online platforms in order to facilitate students in the asynchronous learning process. This shows that there is a blended learning approach in the GIbBL teaching module because this teaching module not only utilizes face-to-face learning, but also online to support the learning process independently (Ramadania and Aswadi 2020; Herliana, F et al. 2022). Therefore, this GIbBL teaching module can be a reference for teachers who have limited learning time at school because with GIbBL, learning can be done anytime and anywhere with the help of various online media, so that the goal of implementing an independent curriculum where students learn based on their respective diversity to form a Pancasila student profile can be realized.

TABLE 6. Students Response Results

No	Assessment Indicator	Percentage Score	Assessment Category
1	Ease of use of Student Worksheet	88.7%	VG
2	Ease of following the learning process	85.8%	VG
3	Assistance of students in understanding the material using the Student Worksheet	90.3%	VG
4	Students' assistance in the learning process	87.1%	VG
	Overall Average Percentage	88%	VG

Furthermore, the results of students' questionnaire assessment of the physics learning process referring to the GIbBL teaching module through Student Worksheet were also obtained. The results of student responses show a very good response where the average percentage of student responses is 88% with the lowest percentage of 85.8% on the indicator of ease of following the learning process. GIbBL Worksheet given to students in general can facilitate and help students in the learning process. However, the ease with which students understand physics concepts through the problems presented in the GIbBL worksheet is lower than the ease of following all the activities presented. This depends on the characteristics of each student where students have various characteristics that cannot be generalized in their learning speed (Aprima & Sari 2022). This is due to the blended learning approach equipped with a guided inquiry learning model (GIbBL). The blended learning approach can help students access learning both face-to-face and online so that the learning process can take place anywhere (Kasli, E et al. 2022). The Student Worksheet attached to the teaching module has also been equipped with a link to relevant learning videos or animations and learning activities that are in accordance with the teaching module so that it makes it easier for students to follow the learning process. This is in line with Kasli, et al. 2022) which states that the blended learning approach is a learning system that combines face-to-face learning and online learning so that it can facilitate students in the learning process even outside the classroom.

From the learning process carried out in the pilot test, students gave a very good response with a percentage of 90.3% for the indicator of student assistance in understanding the material using the Student Worksheet. This is because students carry out the learning process using the syntax of the guided inquiry learning model, namely formulating problems, formulating hypotheses, designing experiments, conducting experiments, analyzing data and making conclusions (Lovisia 2018) assisted by Student Worksheet. Student Worksheet with a guided inquiry model has been proven to help students understand the material (Calesta, Lubis and Sugiarti 2021). With guided inquiry worksheets, students have the freedom to understand concepts and solve problems in groups with the teacher as a guide (Asni, Wildan and Hadisaputra 2020). In addition, Student Worksheet with the Guided Inquiry model is also combined with a face-to-face and online learning system (Blended Learning) so that students also have the freedom to learn anytime and anywhere with teacher guidance equipped with learning media that can be accessed online (Herayanti, L et al. 2020; Miharti, SF et al. 2021).

CONCLUSION

This study aims to produce a guided inquiry based on blended learning (GIbBL) teaching module to be applied to the independent curriculum. Based on the results of research on the development of guided inquiry based on blended learning (GIbBL) teaching modules, it can be concluded that the teaching modules that have been developed are suitable for widespread product testing in order to be applied to an independent curriculum with the acquisition of validation scores by material experts of 93.25% and learning design experts of 92.5%, both of which are included in the very feasible category. The results of the practicality trial in the pilot test obtained the results of the teacher response questionnaire with an average percentage of 88.3% and the response of students with an average percentage of 96.2%, both of which included very good criteria. With the application of guided inquiry based on blended learning (GIbBL) teaching modules, teacher constraints related to limited learning time in physics learning can be overcome so that the implementation of the independent curriculum

can run effectively and efficiently because students can learn anytime and anywhere without time limits, but still under the guidance of the teacher.

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