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Flipsnack-assisted IPAS E-Modules: Substance Forms and Changes for Student Engagement

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Abstract: Fun learning in the classroom is the use of interactive and innovative media because the use of media can make student active. But in reality, there are many factors that cause students to be inactive in the classroom, one of which is the use of media that in still not interesting. This creation of thi flipsnack-assisted E-module development aims to increase student activeness. The method used is Research and Development (R&D) the model used is the ADDIE model. This research was conducted in two schools, namely SDN Kapuk 02 Pagi & SDN Cijantung 03 Pagi. With research subjects of 120 grade IV students using control class and experimental class. Direct observation and testing were the methods used for data collection. In this study, researchers conducted validation, the validation carried out was validation of language, material, and media. Media expert validation results were 92% categorized as "very worthy", 94% material experts categorized as "very worthy", and 87% language experts categorized as "very worthy". Additionally, validation was done by students by filling out questionnaires with 93% results categorized as "very worthy". And in the Score N-Gain test, the average N-Gain value of the experiment class was 62,50% categorized as "quite effective", and in the control class only 24%. Based on the outcomes, it shows that the use of E-modules can increase student activeness in IPAS lessons on the material of the form of substances and their changes.

Keywords: Flipsnack; IPAS E-module; Student activeness

Introduction

Education is a very important aspect, and every individual needs to be educated (Fatayan et al., 2022). Primary education is the first stage in a person's educational journey (Rizkiana & Zulherman, 2023). According to expert Prof. Zaharai Idris: Education is a deliberate contact between adults and students, the purpose of which is to disseminate information, directly and through the media, in an effort to promote overall growth (Ujud et al., 2023). The independent curriculum is the curriculum used in Indonesia today, initiated by the minister of Education Nadiem Makarim. According to Agustina Daga (2021 in Mei 2022) from various literature, the concept of "independent learning" in the learning process means freedom to innovate, think, be creative, learn independently, and be able to achieve happiness.

According to kemendikbud, the independent learning rule aims to make learning fun and also encourages teachers to develop innovative thinking skills. Teachers who inspire innovative thinking can foster students positive attitudes towards learning. Independent learning encourages independent thinking and innovation in education (Lathifah et al., 2022). In the framework of learning, teachers play an important role as guides and directors with focus on the learning process that makes students the prime movers (Muhammad Arfi Rizki Nanda & Zulherman, 2022). The

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independent curriculum prioritiez independent learning that focuses on 21st century competencies, especially those related to the environment (Suhelayanti et al., 2023) . In this curriculum, teachers are given the freedom to choose various learning tools, so that the learning process can be tailored to the wants and needs of student.

In the independent curriculum there are two subject that are combined into one, namely (IPAS). The purpose of uniting the natural and social sciences in the independent curriculum is to encourage a well-rounded education that is relevant to the context of life. The merging of science and social science disiplines can increase understanding of socio-economic, cultural, and historical realisties in Indonesia and around the world driven by multicultural education. Living things, objects, properties (gas, liquid, and solid); energy changes (sound, heat, force, electricity, simple aircraft, magnetic, and light) living things, the earth and the universe, environment and place; change, time, sustainability; the prosperity; economic behavior and socio cultural systems, all fall within the range of IPAS lessons (Suhelayanti et al., 2023).

The implementation of learning psychology theory in IPAS learning can be achieved through several techniques, such as: Efficient use of learning medi. Using useful educational media can improve students understanding of principles and concepts in IPAS learning. Examples of effective learning media include displaying images, videos, playing interactive games. Interactive learning media can improve students understanding of comlicated and abstract IPAS topics; Active learning. Active learning encourages students to participate and understand the concept of IPAS activities such as debate, experiments, practical lab, and projects can be run as part of this active learning, allowing students to be able to practice and apply IPAS concepts in real life scenarios.

Learning media is used as a tool to reinforce the subject matter and achieve the desired results. The selection of learning media contributes positively to student learning motivation, especially when students are actively involved, creative, and motivated (Zulherman et al., 2021). The learning media created must also be easy to use and interesting, one of which is the e-module.

According to (Widyaningrum & Patrikha, 2021) e-modules are a digital format of media materials to achieve the goal of implementing self-composed learning competencies. E-modules can be used anywhere and anytime because they are electronic, so they are not easily damaged like books (Awwaliyah et al., 2021). A computer or other device that can read a printed module that has been converted to an electronic format together with associated software is called an electronic module, or e-module (Anjarsari et al., 2023).

In addition to being easy to use, e-modules also have a more attractive appearance because they contain images that match the material and can display videos that can make learning more effective (Ramadhina & Pranata 2022). Studying natural science (IPA), which is sometimes viewed as frightening but is truly science disciplines offer a students studying science courses are given the opportunity to develop high-level thinking skills such as reasoning, creativity, critical analysis, and methodical thinking (Sarwinda & Meilana, 2019). Using e-modules that incorporate different multimedia information can make it easier to understand. E-modules are designed to attract students' attention and increase their learning activity (Prasetyo & Zulherman, 2023).

Researchers have made observations and obtained results that especially in class IV a problem has been found, namely, regarding the lack of interesting media in learning, which makes students inactive. In learning, especially in the material of Substance Forms and Changes in IPAS subjects, teachers still tend to use only textbooks, which causes students to be bored and become inactive in learning. This problem makes the researchers want to develop a medium, namely the IPAS e-module for students, especially grade IV, which contains the material of Substance Forms and Changes with the help of the flipsnack application. It is expected that the use of e-module with the help of flipsnack will increase the students' activity, especially in the material of Substance Forms and Changes in IPAS class IV.

Method

Research and Development (R&D) is the method used by researchers (Mahendra et al., 2021). The media used in this study is the IPAS e-module supported by the flipsnack application on the material of the form of substances and their changes to increase the activity of grade IV students in elementary schools. The ADDIE model is the model used in this study, which includes 5 steps, namely 1) Analysis, 2) Design, 3) Development, 4) Implementation, 5) and Evaluation (Hiralda & Zulherman, 2023).

This research was conducted in two schools: SDN Kapuk 02 Pagi and SDN Cijantung 03 Pagi. The study was conducted with fourth-grade students in the even semester, with a total of 120 students. The expeiment class consisted of 60 students, while the control class consisted of 60 students. The following techniques were employed to collect data: observation, validation, tests, questionnaires, and documentation. A series of tests were conducted to assess student engagement, with ten

multiple-choice questions included in both the pretest and posttest.

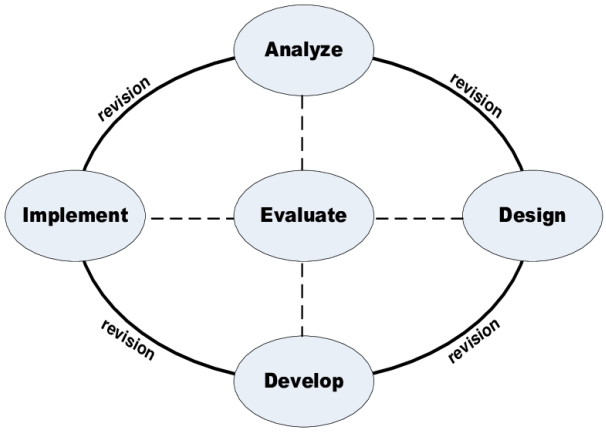

Figure 1. Stages of the ADDIE Model

The data was subjected to analysis by the researcher, employing both qualitative and quantitative methodologies. The quantitative data was derived from the responses to the questionnaire (Handiar & Zulherman, 2023). Qualitative data was gathered through comments and suggestions in the questionnaire, subjected to descriptive analysis, and employed for the purpose of evaluating the product. A Likert scale of 1 to 5 was employed to calculate the experts' validity test, with each expert selecting one of the five possible responses. The following table presents the scores and categories for the experts' validity test:

Tabel 1. Expert Validation Rating System

Score	Category
5	Very good
4	Good
3	Good enough
2	Not good
1	Very poor

In addition to the validity test questionnaire, the researchers also used instruments that were completed by the students, namely questionnaires. According to (Sugiyono, 2019) a survey or questionnaire is a tool for gathering data. method in which the respondent provides written responses consisting of statements or questions. The questionnaire is intended to analyze the practicality of the product, and to seek feedback and suggestions from the respondents. In this study, the researchers used a questionnaire with ten statements and five response options. In the choice of answers, the researcher uses a Likert scale with a vulnerable score of 1-5 where students choose one of the five existing options (Ramadhina & Pranata, 2022). The following is a table of scores and categories in the student questionnaires.

Tabel 2. Scores and Categories of Student Questionnaire Instruments

Score	Category
5	Strongly Agree
4	Agree
3	Moderately Aggre
2	Disagree
1	Strongly Disagree

After the validation data obtained from the language expert, material, material, and student questionnaires are collected, then the assessment will be calculated using the formula. Below is a table of the feasibility scale of e-module development with the help of the flipsnack application.

Tabel 3. Percentage Criteria for Product Validation

Percentage	Criteria
81%-100%	Very Decent
61%-80%	Feasible
41%-60%	Decent Enough
21%-40%	Not Decent
0%-20%	Very Inadequate

The N-Gain score test was used to examine the pretest and posttest findings in the control class and experimental class to ascertain the effectiveness of the intervention in increasing student engagement in class, with a particular focus on class IV. Subsequently, the statistical significance of the independent T-test was determined control and experimental classes in terms of their N-Gain scores. The following table presents the percentage distribution of N-Gain groups.

Tabel 4. N-Gain Grouping Percentage

Percentage	Criteria
<40	Not Effective
40-55	Less Effective
56-75	Moderately Effective
>76	Effective

Result and Discussion

The result of this study is the production of a learning media product, namely the IPAS e-module on Substance Forms and Changes, created with the help of the flipsnack application. This product is designed to increase the activeness of grade IV students in elementary schools. Learning media has the potential to encourage, inspire, and increase motivation in the learning process (Feri & Zulherman, 2021). The model

applied is a model that contains five stages, namely the ADDIE model: The five-stage model, known as the ADDIE model, comprises the following stages: analysis, design, development, implementation, and evaluation. The analysis stage involves direct observation at the school. The design stage begins with the design of the material for the Substance Forms and Changes e-module, which is then prepared using Canva (Muthmainnah et al., 2023).

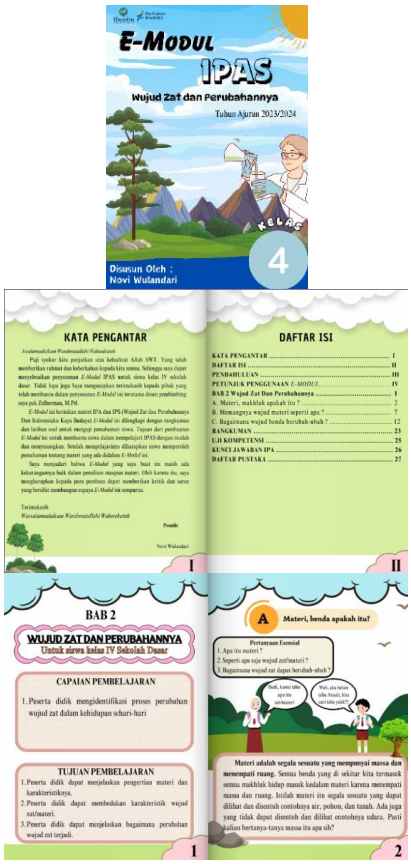

Figure 2. IPAS E-Module with flipsnack assistance

Once the design and fabrication of flipbooks through the Flipsnack application have been completed, the next step is to validate the quality of the media with experts in various fields. These include material experts, linguists, and media experts. The validity test ensures that the media data developed by researchers is correct and practical (Sugiharni, 2018). Media expert validation is conducted to identify any shortcomings in the media and ascertain whether the learning media is suitable for use. Following the evaluation, improvements will be implemented based on the input and recommendations provided by the validator (Qouri & Zulherman, 2023).

Media experts have posited that the e-module's visual appeal is satisfactory, yet the names of the authors could be more prominent. The material expert has indicated that the material displayed is of an appropriate standard and is in accordance with the learning objectives. However, there are still instances where the language used is less precise. According to the linguists, the e-module is of an acceptable standard, although there is still a small amount of language that is not yet fully standardised. The following table presents the percentage results of experts regarding the feasibility of the product.

Tabel 5. Expert Validation Results

Validator	Score Obtained	Maximum Score	Average Percentage
Material	85	90	94%
Media	55	60	92%
Language	52	60	87%
Total			91%
Qualifications			Very Feasible

Table 5. The averaged percentage obtained is 87% for linguists, 94% for material experts, and 92% for media experts, resulting in a total of 91% and categorized as "Very Feasible." The e-module media is a highly feasible tool for use, but it still requires improvement based on the recommendations provided by each expert.

Once the product has been developed and validated by experts, the implementation stage is next, during which the e-module media is implemented directly in real learning. At this juncture, product validation is conducted through the administration of a questionnaire to students enrolled in the experimental class. The questionnaire finding show that the product is 93% "very feasible." Furthermore, the evaluation stage entails the administration of pretest and posttest questions to students. The pretest and posttest each contain 15 multiple-choice questions. To ascertain the efficacy of the e-module, researchers employed the N-Gain formula to determine the extent to which it enhanced student engagement, particularly in IPAS lessons pertaining to the nature of substances and their transformations. Display the control and experimental classes pretest and posttest results.

Tabel 6. Average results of N-Gain scores of experimental and control classes

	Experimental Class N-Gain Score	Control Class N-Gain Score
Average	62.50	24.07
Minimum	37.50	25.93
Maximum	100	50.00

Table 6 From this data, that is evident the conclusions demonstrated that the average N-Gain score for the experimental class, which utilized the e-module with the assistance of Flipsnack, was 62.50%, which was

classified as "Quite Effective." This score was determined to be efficient, requiring a minimum of 37.50% and a maximum score of 100%. In contrast, the average result in classes that do not use e-modules is 24.7%, which has been qualified as "Ineffective" with a minimum score of 25.93% and a maximum score of 50.00%. It can be concluded that the e-module experimental class is able to enhance the engagement of fourth grade students in IPAS lessons pertaining to the subject of the forms of substances and their transformations. Following the administration of the N-Gain Score test, the subsequent stage is the Independent T-test, which is employed to evaluate the N-Gain score. The following table presents the results of the Independent T-Test:

Tabel 7. Independent T-Test results for N-Gain Score

		F	Sig	t	df	Sig. (2-tailed)
N-Gain Skor	Equal Variances Assumed	0.849	0.359	16.432	118	0.000

The T-test table is presented below. It can be stated that the significance value is 0.359, which is greater than 0.05. It can be stated with confidence that the variance of the N-Gain percentage for the control class and experimental class is homogeneous. The independent t-test for N-Gain score uses the value of the significance level presented in the table and assumes that the variance is the same. In light of the aforementioned results, it can be concluded that the significance level is: The two-tailed test yielded a p-value of 0.000, which is less than 0.005. From these results, it can be concluded that there is a significant difference between the class that used the electronic module with the help of Flipsnack and the class that did not use the electronic module. The class that used the electronic module demonstrated a notable increase in the engagement of grade IV students in the subject of IPAS in elementary school.

Based on permendikbud No. 65 of 2013 concerning process standards for primary rand secondari education, schools should use information and communication technology, such as computers, teaching aids, or media, to increase activeness in learning (Hendri, 2018). But in reality, teachers still use the tradisional lecture method when teaching, and the only technology used is the blackboard, power point, and books (Handiar & Zulherman, 2023). The teachers have never made an interesting e-modules as a medium to support classroom learning. For this reason, researchers think about media than can increase student activeness in the classroom, namely by making e-modules with the help of flipsnack. Furthermore, based on the results of research observations at SDN Kapuk 02 Pagi and SDN Cijantung 03 Pagi, it was found that the lack of use of interactive and interesting media made student in active. After the e-module was produced, it was validated by media, material, and language. The validation of material expert obtained a result of 94% which was categorized ad very feasible. Validation on media experts get results 92% categorized as very feasible. And validation on linguists 87% is categorized as very feasible. This research is in line with research conducted by (Rizkiana & Zulherman, 2023) which states that it is very feasible to use increase student activeness in class on ipas material.

According to previous research, the e-module media designed with the flipsnack application has visual advantages with many images that look realistic. In addition, this media display information with an attractive display (Rizkiana & Zulherman, 2023). This happens according to the fact that e-modules are made to captive students in learning activities so that learning becomes active. Looking at the calculation of N-Gain, the results of 62,50% in the experimental class were categorized as "Quite Effective", while in the control class the results of 24,07% were categorized as "Not Effective". After that, the T-test test was carried out to see whether the e-module used was significant difference. so it can be concluded that there is a difference in classes using e-modules and classes that use books on student activeness. E-module assisted by flipsnack application on IPAS learning material Substance Forms and Changes is practical to use in the learning process (Safavi et al., 2023).

Based on research results (Hendri, 2018) stated that the e-module had a good impact on increasing student activeness with a results of 90%, and had a positive impact on student activeness in the classroom, the activeness was very high at each meeting. In the research (Sugiharni, 2018) also explained the results that the e-module products developed are suitable for use as learning media for elementary school student, especially in learning ipas. The use of e-modules makes students very active and enthusiastic in participating in learning because of the attractive e-module display and students also can't wait for the material in the next e-module (Maulita et al., 2023). E-modules are tools that are in herently conducive to ease of use, as they can be taken anywhere and used at various times, especially in the context of the digital era (Parinduri et al., 2022). According to previous researchers, e-modules themselves have advantages which can be easily used independently, clear teaching materials, and an attractive appearance (Hendri, 2018). Students are more inclined to engage with digital-based media due to its

inherent ease of use and the capacity to facilitate technology-based learning. Especially today, with the existence of e-modules, students can learn independently and no longer depend on others (Lestari et al., 2022). The development of e-module is different from printed books or package books, regardless of the material in the pronted book. The difference lies in the physical form and how to use it (Rahmadhani & Efronia, 2021).

The utilization of electronic modules can confer advantages to students, including convenience, effectiveness, and efficiency in attaining knowledge. A review of similar research conducted (Rizkiana & Zulherman 2023) indicates that the use of e-modules in conjunction with the Flipsnack application is an effective method of enhancing classroom learning activities and promoting student engagement. Student participation in the learning process, including completing tasks, having conversations about the problem solving process, approaching peers or teachers for clarification when necessary, and being able to present the report's findings (Prasetyo & Abduh, 2021). Based on previous researchs the use of the flipsnack application is also very accessible, featuring a plethora of engaging icons (Triwahyuningtyas et al., 2020). Users are able to incorporate audio into their flipbooks, fostering a dynamic and engaging learning experience. This flipsnack-assisted e-module is also able to improve student literacy, especially in ipas learning (Aji et al., 2022). It is hoped that by conducting this research, it can have a major positive impact in creating educational materials that are in accordance with the latest technological developments.

Conclusion

The aforementioned research's findings suggest that using IPAS e-modules in conjunction with the Flipsnack app to teach Substance Forms and Changes content can boost fourth-grade students' engagement in the classroom and that using the media is highly practical. It is hoped that more study can be conducted and improved.

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Author Contributions
Novi Wulandari contributed to developing the product, conducting research, analyzing data, and writing the article. Zulherman acted as a supervisor who guided during the research and writing activities.

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Conflict of Interest
The authors declare no conflict of interest.

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