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# Development of an Interactive E-Module on Price Indices and Inflation for Grade XI at YP Unila Senior High School Bandar Lampung

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**Abstrak:** Penelitian ini dilatarbelakangi oleh minimnya penggunaan media pembelajaran interaktif dan rendahnya motivasi belajar peserta didik dalam pembelajaran ekonomi. Penelitian ini bertujuan untuk mengetahui kelayakan, kepraktisan, dan keefektifan media pembelajaran interaktif E-Modul berbasis Flip PDF Professional dengan Quick Response Code pada materi harga indeks dan inflasi kelas XI SMA YP Unila Bandar Lampung ditinjau dari kevalidan sebagai media pembelajaran serta peningkatan hasil belajar peserta didik. Jenis penelitian ini adalah Research and Development (R&D) dengan model pengembangan ADDIE yang terdiri dari lima tahapan yaitu Analysis, Design, Development, Implementation, dan Evaluation. Hasil validasi menunjukkan bahwa E-Modul yang dikembangkan berdasarkan penilaian ahli media memperoleh rata-rata skor 3,83, ahli materi sebesar 3,55, dan ahli bahasa sebesar 3,85, sehingga diperoleh rata-rata keseluruhan sebesar 3,74 dengan kategori "sangat layak" digunakan dalam pembelajaran. Hasil uji kepraktisan menunjukkan bahwa E-Modul memperoleh respon positif dari guru dengan kategori "sangat praktis". Adapun hasil uji keefektifan menunjukkan adanya peningkatan hasil belajar peserta didik, dengan rata-rata nilai pretest sebesar 47,26 meningkat menjadi 87,38 pada posttest. Selain itu, Presentase N-Gain yang diperoleh sebesar 76,82 dan masuk dalam kategori "Efektif". Dengan demikian, E-Modul interaktif berbasis Flip PDF Professional dengan Quick Response Code dinyatakan layak, praktis, dan efektif digunakan sebagai media pembelajaran dalam meningkatkan hasil belajar peserta didik pada mata pelajaran ekonomi.
***Kata Kunci:*** *E-Modul Interaktif, Flip PDF Professional, QR Code, Harga Indeks, Inflasi*

***Abstract:*** *This study was motivated by the limited use of interactive learning media and the low learning motivation of students in economics learning. The purpose of this study was to determine the feasibility, practicality, and effectiveness of an interactive E-Module learning media based on Flip PDF Professional with Quick Response Code on the topic of price index and inflation for eleventh-grade students at SMA YP Unila Bandar Lampung, viewed from its validity as a learning medium and its ability to improve students' learning outcomes. This study employed the Research and Development (R&D) method using the ADDIE development model, which consists of five stages: Analysis, Design, Development, Implementation, and Evaluation. The validation results showed that the developed E-Module obtained an average score of 3.83 from media experts, 3.55 from material experts, and 3.85 from language experts, resulting in an overall average score of 3.74, which falls into the "highly feasible" category for use in learning activities. The practicality test results indicated that the E-Module received positive responses from teachers and was categorized as "highly practical." Furthermore, the effectiveness test results showed an improvement in students' learning outcomes, with the average pretest score increasing from 47.26 to 87.38 on the posttest. In addition, the N-Gain percentage obtained was 76.82, which is categorized as "effective." Therefore, the interactive E-Module based on Flip PDF Professional with Quick Response Code was declared feasible, practical, and effective as a learning medium to improve students' learning outcomes in economics subjects.*
***Keywords:*** *Interactive E-Module, Flip PDF Professional, QR Code, Price Index, Inflation.*

## INTRODUCTION

A key part of any country's progress towards prosperity is its education system, which helps to develop a workforce that is well-informed, skilled and flexible enough to keep pace with rapid technological change. The education system is just one of many sectors that have felt the impact of the technological revolution in the modern era. The expansion of ICT opens up new possibilities for the education sector to utilise digital learning resources to create a more engaging, effective and efficient learning environment. As Arifin & Mu'id (2024) point out, education does more than simply convey information; it helps shape students' personalities and equips them with the skills they need to tackle the increasingly complex problems of the world. Consequently, teachers in the modern era must be technologically literate in order to implement new forms of education that meet the requirements of twenty-first-century students.

Various educational institutions in Indonesia are now implementing the Mandiri curriculum, which is aligned with the use of technology in education. The use of digital technology in the classroom, student-centred learning, individualised teaching and competence-based learning are all at the heart of the Mandiri curriculum. To succeed in this programme, students must demonstrate the following skills, the ability to learn independently, participate actively in class, think critically and solve problems creatively (Bustami, et.al, 2023; Karsiwan, et.al, 2023). For this reason, access to innovative learning materials is a crucial component in ensuring the smooth implementation of the Mandiri curriculum. However, there are issues with the economics curriculum, particularly regarding the price index of materials and inflation, according to preliminary observations carried out at YP Unila High School in Bandar Lampung. The use of textbooks, worksheets and traditional teaching methods continues to dominate the learning process. People still prefer to sit back and do nothing whilst studying, which means that interactive digital learning materials are not widely used.

Furthermore, many students find it difficult to calculate price indices, and the subjects of inflation and price indices are inherently challenging as they require skills in data analysis, graph interpretation, conceptual understanding and calculation (Mayzar, & Karsiwan, 2024). It is well known amongst economics teachers at YP Unila High School in Bandar Lampung that the majority of their students struggle to grasp these concepts. The cost-of-living index and inflation rates are challenging due to the abstract nature of the subject matter and the large number of mathematical calculations involved. Furthermore, educators state that the lack of student engagement stems from the inability of teaching materials to provide clear examples of economic concepts.

As a result of these circumstances, pupils' motivation to learn has declined, which in turn has led to substandard learning outcomes. Students' increasing reliance on digital devices only exacerbates the problem (Karsiwan, et.al, 2023). Nowadays, almost every learner has access to a smartphone, which could significantly enhance their learning experience. However, more people use these devices for entertainment rather than for educational purposes. Smartphones, on the other hand, have the potential to be powerful tools for self-directed learning whenever and wherever students need them.

As noted by Hasan, Milawati, & Darodjat (2021), learning media encompass all tools used to convey learning messages in such a way that learners can effectively absorb and understand the knowledge provided. Learning media act as intermediaries in communication between teachers and student, as demonstrated by Mukarromah & Andriana (2022). The creation of learning media is also necessary to adapt teaching

materials to the individual needs and characteristics of students (Ritonga, Andini, & Iklmah, 2022). Students can better understand difficult concepts when they are taught using appropriate learning media (Yulfiani & Karsiwan, 2025). The characteristics of modern students are very much in line with those of 'digital natives', making advances in learning media all the more important.

According to Alamsyah, Yuliani, Ramadhan, Rosdiah, & Sudirman (2023), the use of technology-based learning media can improve the efficiency of content delivery, learners' interest, and their motivation to learn. Learning through interactive media may be more engaging than through more static forms of teaching. The term 'interactive learning media' describes any type of media that facilitates communication between users. Interactive learning media is defined by Putri, Islamiah, Andini, & Marini (2022) as media that conveys learning content and provides feedback to users through the use of software and hardware. According to Abdullah (2021), learners and learning media are engaged in a two-way process of action and response. Consequently, students can be more actively involved in their own learning through the use of interactive media. In the field of economics, e-modules are one type of interactive learning medium.

According to Simanjuntak & Hidajat (2025), an e-module is a new type of digital educational resource built upon traditional modules by incorporating multimedia elements such as audio, video, animation and interactive quizzes. At the same time, an e-module is a digitally organised teaching resource that enables students to learn independently, as explained by Nana (2022). Its capacity to facilitate self-directed learning, in line with the characteristics of an independent curriculum, is one of the greatest strengths of the e-module, alongside the fact that it presents more engaging content. As E-modules are self-directed, customisable, self-contained and user-friendly, they are an ideal medium for teaching economics. Thanks to these characteristics, students can study the content independently, without relying solely on their instructor.

To make everything more user-friendly, e-modules can combine a wide range of digital learning materials into a single interface. E-modules created using the Flip PDF Professional programme form the focus of this study. Batubara (2021) states that Flip PDF Professional is a programme capable of converting PDF files into interactive flipbooks that incorporate multimedia elements such as audio, video, animations, links and quizzes. According to Sardi, Muchtar, & Makhshun (2025), this application can be used as an alternative to digital learning materials to stimulate students' interest in learning. Rindaryati (2021) supports this view by outlining how Flip PDF Professional can create engaging digital pedagogical resources that are accessible across a range of digital devices. Flip PDF Professional was selected due to the wide range of benefits it offers. This programme makes it possible to combine various forms of multimedia to bring theoretical economic concepts to life. Topics such as price indices and inflation can be better understood through the use of educational films, animations, visuals and simulations rather than simply reading a textbook.

Combining QR code technology, this study also utilised Flip PDF Professional. Using a smartphone, you can quickly access various data stored in a two-dimensional code known as a QR code. Without having to manually enter a website URL, learners can access e-modules by scanning the QR code. Consequently, accessing course materials is much easier. According to previous research, the use of e-modules created with Flip PDF Professional enhances learning. E-modules created using Flip PDF Professional have a validity rate of over 94 per cent and are well received by students, according to a study conducted by Wardani, Pramartaningthyas, Rohman, & Alimin

(2025). Furthermore, e-modules built using Flip PDF Professional achieved a media validity of 95.6% and a content validity of 93.2%, according to a study by Rohmah & Sakti (2022), which resulted in an 81.3% improvement in students' understanding. All things considered, the research findings indicate that e-modules built using Flip PDF Professional are a powerful tool for education.

Research and development (R&D) in this study utilised the ADDIE (Analysis, Design, Development, Implementation, Evaluation) approach proposed by Reiser and Mollenda. The ADDIE model was chosen for its methodical procedures and ease of adaptation to the creation of high-quality educational materials. Learners' requirements and learning challenges were identified during the analysis phase. The structure and layout of the e-module were designed during the design phase. During the development phase, the product was created in line with expectations. During the implementation phase, the product was tested on learners. Subsequently, during the evaluation phase, the product was assessed and refined.

Branch & Varank (2009) argue that the ADDIE model is a useful tool for developing technology-based educational products due to the systematic approach it offers, which begins with requirements analysis and concludes with product evaluation. These findings lend credibility to the application of the model in this study. As it consistently yields useful, applicable and successful results, this model is widely used in the creation of digital learning materials. At YP Unila High School in Bandar Lampung, students struggle not only with conceptual understanding but also with a heavy reliance on paper for their economics lessons.

The students continue to use printed versions of assignments and practice questions, resulting in high operational costs. An environmentally friendly alternative to paper-based electronic modules is Flip PDF Professional with QR codes, which can help schools reduce their paper usage. The development of interactive learning materials based on E-modules using Flip PDF Professional with QR codes for the subject 'Price Index of Materials and Inflation' for Year 11 at YP Unila Senior High School in Bandar Lampung was driven by a number of issues, needs, theoretical reviews and previous research. In line with the demands of students in the twenty-first century, this learning resource is designed to enhance students' intrinsic motivation to learn, their understanding of the subject matter, their level of active participation in their own education, and the effectiveness of their learning.

## METHOD

A research and development (R&D) approach was used in this research process. Research and development, or R&D, is a research strategy for creating a product and finding out how to make it work in the real world. To create or refine a product, as well as to evaluate its design, development is a research approach that must meet the following criteria: validity, practicality and efficiency (Laksana, Qondias, & Oka, 2025). The process of creating a new product with the aim of improving the current product.

According to Rindrayani, Rustiyana, Judijanto, Abdullah, & Ardiyanti (2025), research and development (R&D) is best understood as a cycle that begins with research and ends with development. The aim of this research is to collect data from users. Furthermore, R&D is a branch of research that seeks to construct, expand and further investigate a theory within a specific field (Pendit, 2003). Research and Development (R&D) methodology is used to systematically create and evaluate the efficacy of a

product, as explained in greater detail by Waruwu (2024). The final product of this study is an interactive, professional PDF module with a built-in QR code for learning materials on price indices and inflation graphs for Class XI at YP Unila Senior High School in Bandar Lampung.

The ADDIE model which stands for Analysis, Design, Development, Implementation, and Evaluation is the development approach used in this study. The ADDIE model was chosen because its procedures are well-structured and suitable for creating digital learning materials. Sugiyono (2024) states that the ADDIE model is a framework for developing learning products that follows a systematic process of research, planning, coding, testing, and evaluation. The following are the stages of the ADDIE model covered in this study:

1. Analysis Stage: Researchers at YP Unila Senior High School in Bandar Lampung interviewed and observed economics teachers to gather information on their students' demographics, learning styles, and challenges regarding inflation, the consumer price index, and other learning-related issues.
2. Design Phase: In this phase, the researchers planned the layout of the interactive e-module, decided on its visual style, created a storyboard, organised page navigation, and developed the interactive features to be used in the e-module, which was created using Flip PDF Professional and integrated with QR codes.
3. Development Phase: At this stage, the researchers begin working on the e-module using Flip PDF Professional, incorporating elements from Canva and PowerPoint for the module's visual design. Prior to testing, the final product is reviewed by specialists in media, materials and linguistics to ensure its quality.
4. Implementation Stage: The e-modules approved for trial use by Class XI students at YP Unila High School in Bandar Lampung have now entered this stage.
5. Evaluation Phase: To determine how successful, realistic and suitable the learning materials are, we are carrying out an evaluation process. Expert validation questionnaires, teacher and student feedback surveys, and students' pre- and post-test results are used for this evaluation. The findings of this evaluation serve as the basis for product modifications, ensuring that the materials produced are of a higher standard and aligned with the demands of the learning process.

Preliminary research was carried out at YP Unila Senior High School in Bandar Lampung during the analysis phase to ascertain the state of economics education, with a focus on the cost-of-living index and inflation. This was achieved through semi-structured interviews with economics teachers and direct observation. The use of teaching aids by teachers and pupils, learning activities, and the challenges faced during teaching were all studied through observation. The aim of these interviews was to gather data on the characteristics of the pupils and their needs regarding interactive learning materials.

The classroom observation tool consisted of an observation sheet covering pupils' learning activities, the use of teaching aids, and the classroom layout for learning. Limitations in learning, the use of digital learning resources, the need for interactive teaching materials, and learners' willingness to utilise learning technology were topics that could be explored through open-ended interview questions, which took the form of an interview guide.

At this stage of the analysis, the researcher carried out three types of analysis, namely:

1. Needs assessment is a method for determining what type of interactive learning material would be most useful in making the topics of price indices and inflation more engaging and effective for students and instructors.
2. An assessment of learners' characteristics, with the aim of identifying their aptitudes, learning styles, interests and proficiency in using digital learning formats.
3. The process of developing e-modules aligned with the expected learning outcomes for learners involves curriculum analysis. This entails an evaluation of the content within the Mandiri curriculum, as well as the learning objectives and targets.

## RESULTS AND DISCUSSION

## RESULTS

### A. Results of the Expert Material Test

The research and development team began by creating or refining the media design during the development phase, and then proceeded to the validation stage. Once the design was finalised, the researchers had it validated by a panel of experts, including a language expert from the Indonesian Language and Literature Education Department at STKIP PGRI Bandar Lampung, Ms Hastuti, S.Pd., M.Pd; a subject matter expert from the Economics Education Department, Ms Dyanti Mahrunnisya, S.Pd., M.Pd; and a media expert from the same programme, Ms Vetri Yanti Zainal, S.E., M.Pd.

1. Media Expert Validation

The results of the language expert's validation are presented in the following pie chart:

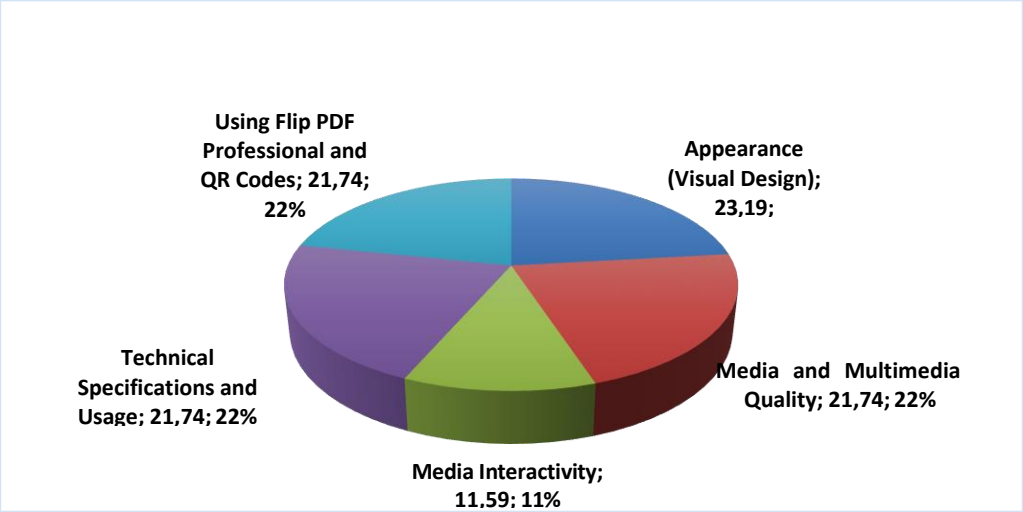



Figure 1. Media Expert Validation

The visual design aspect received the highest score of 16 points (23.19%), indicating that the validators rated the interface design, layout, colour scheme and visual presentation of the e-module very highly, according to the pie chart of the media expert validation results. Similarly, 15 points (an increase of 21.74%) were recorded in the areas of technical elements and usability, media and multimedia quality, and the utilisation of Flip PDF Professional and QR codes, indicating that the media met the required standards for multimedia, usability and digital technology integration. The

media interaction component indicates that the interactive elements provided have aided the learning process, scoring 8 points (11.59%), which is excellent. With an average score of 3.83 across all dimensions, the resulting learning materials were assessed as being of exceptional quality and fall into the 'highly recommended' category for use in the learning process.

2. Subject Matter Expert Validation

Based on the assessment by subject matter experts, the results of the validation are as follows:

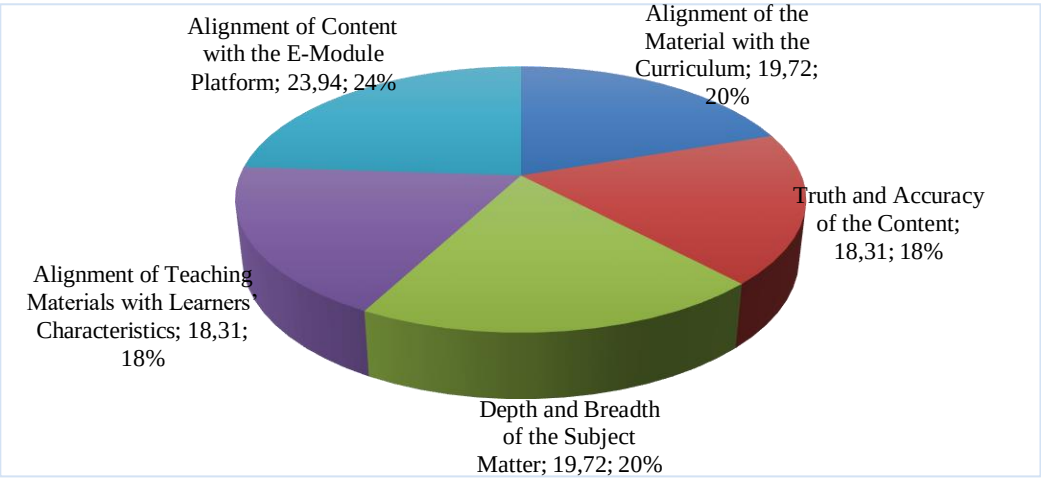



Figure 2. Subject Matter Expert Validation

The aspect of material suitability for the E-module medium received the highest score (17 points, or 23.94% of the total) in the material expert validation pie chart. This indicates that the content provided complies with digital media standards, can utilise the features of Flip PDF Professional, and features optimal QR code integration to support it. In addition, 14 points (19.72%) were awarded for the breadth and depth of the material and its curricular alignment, indicating that the content is in line with the learning objectives of the self-directed curriculum and meets the competency levels of Year 11 pupils. Concurrently, the correctness and accuracy of the material, as well as its suitability for the characteristics of individual learners, received 13 points (18.31%), indicating that the content is presented correctly, accurately, is easy to understand, and is relevant to the learners' cognitive development levels. The e-module developed was deemed "highly suitable" and met all the requirements for a practical learning tool, according to the validation findings, resulting in a total score of 71 with an average of 3.55.

3. Language Expert Validation

Based on the language experts' assessment, the following results were obtained:

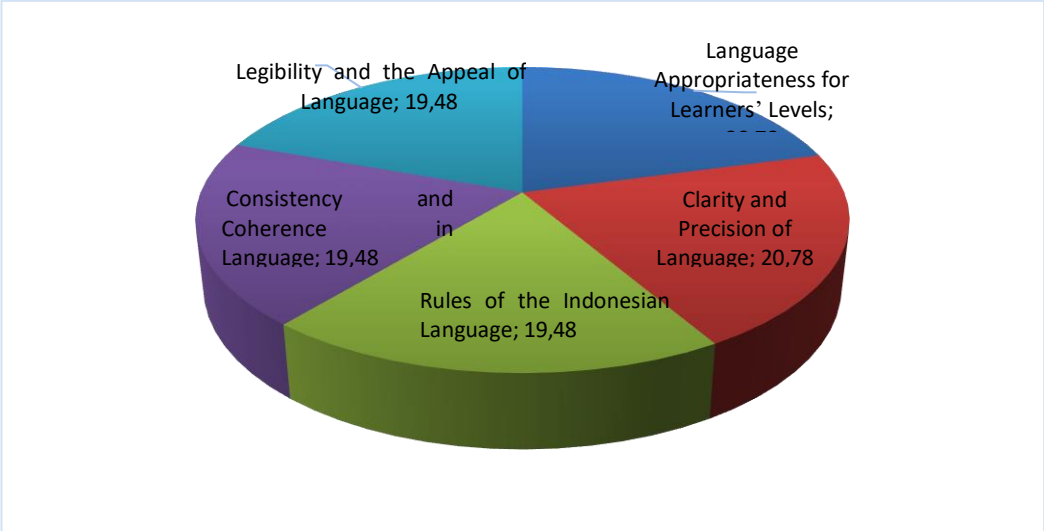



Figure 2. Language Expert Validation

The findings of the linguistic validation pie chart indicate that the language used in the e-module is easy to understand, communicative, and capable of conveying information clearly and accurately. This also shows that the aspects of language appropriateness for the learners' level, and clarity and accuracy of language, received the highest scores, at 16 points (20.78%) each. Furthermore, the following aspects of the Indonesian language readability, appeal, terminological consistency, section integration, and grammatical aspects all scored 15 points (19.48%); this indicates that the language is engaging, features good spelling and grammar, and is consistent overall, with the exception of a few items that scored only 3. Overall, the results of the linguistic expert validation achieved a total score of 77, with an average of 3.85. This means that the linguistic aspects of the e-module developed meet the criteria for good, correct and communicative language use and are in line with the characteristics of the learners to support the learning process, placing it in the 'highly suitable' category.

The next stage is the implementation stage, which involves conducting a trial.

1. Teacher Feedback Questionnaire

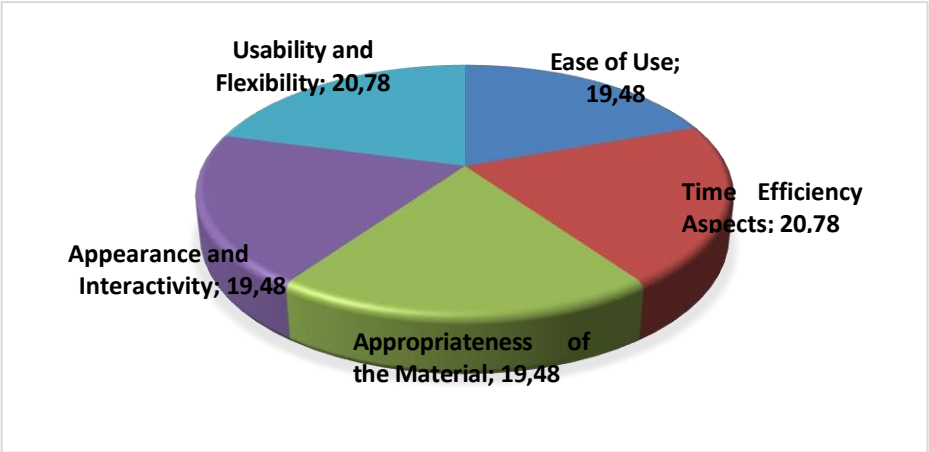



Figure 4. Teacher Feedback Questionnaire

The pie chart above shows teachers' responses regarding the practicality of interactive e-modules, indicating that the most important features are time efficiency, usability and flexibility, each of which received 16 points (20.78%). This indicates that e-modules can help teachers save time on learning, make the teaching process more effective, facilitate the explanation of material, and manage learning flexibly. At the same time, the e-module received 15 points (19.48%) in the areas of ease of use, content relevance, and presentation and interactivity, indicating that the module is user-friendly, contains content aligned with learning objectives, and is supported by engaging visual and interactive elements. With a total score of 77 and an average of 3.85 on the teacher feedback questionnaire, the interactive e-module produced was rated as 'highly practical' and is considered a suitable medium for economics education in Class XI.

2. Product Testing Results

Table 5. Product Trial Results

| No | Name | Learning Outcomes | | N-Gain Score | Improvement | N-Gain (%) |
|---|---|---|---|---|---|---|
| | | Pre-test | Post-test | | | |
| **1** | AGF | 40 | 85 | 0,75 | High | 75 |
| **2** | AFLA | 85 | 97 | 0,8 | High | 80 |
| **3** | ANZ | 40 | 90 | 0,83 | High | 83,33 |
| **4** | AP | 50 | 92 | 0,84 | High | 84 |
| **5** | ASU | 42 | 95 | 0,91 | High | 91,37 |
| **6** | CA | 75 | 100 | 1 | High | 100 |
| **7** | FNA | 45 | 87 | 0,76 | High | 76,36 |
| **8** | FSKP | 50 | 95 | 0,9 | High | 90 |
| **9** | GRA | 50 | 100 | 1 | High | 100 |
| **10** | INA | 55 | 97 | 0,93 | High | 93,33 |
| **11** | IBF | 22 | 87 | 0,73 | High | 73,86 |
| **12** | KAR | 45 | 90 | 0,81 | High | 81,81 |
| **13** | LD | 35 | 70 | 0,53 | Medium | 53,84 |
| **14** | LR | 37 | 70 | 0,52 | Medium | 52,38 |
| **15** | MWY | 85 | 95 | 0,66 | Medium | 66,66 |
| **16** | MAWP | 47 | 97 | 0,94 | High | 94,33 |
| **17** | NFA | 30 | 95 | 0,92 | High | 92,85 |
| **18** | NFA | 45 | 97 | 0,94 | High | 94,54 |
| **19** | RAFA | 47 | 97 | 0,94 | High | 94,33 |
| **20** | RN | 65 | 82 | 0,48 | Medium | 48,57 |
| **21** | RFC | 50 | 65 | 0,3 | Medium | 30 |
| **22** | RAF | 60 | 95 | 0,87 | High | 87,5 |
| **23** | SSA | 45 | 97 | 0,94 | High | 94,54 |
| **24** | SRP | 27 | 25 | -0,02 | A Decline Has Occurred | -2,73 |
| **25** | TSPB | 15 | 82 | 0,78 | High | 78,82 |
| **26** | WJW | 42 | 90 | 0,82 | High | 82,75 |
| **On average** | | **47,26** | **87,38** | **0,76** | | **76,82** |

Source: Researchers' data analysis, 2026

Based on the results of the analysis of the data obtained, 20 out of 26 pupils (76.95%) had a 'high' level of understanding, 5 out of 26 pupils (19.20%) had a 'moderate' level of understanding, and 1 out of 26 pupils (3.85%) had a 'low' level of understanding. A "high" level of understanding was accompanied by an average N-Gain score of 0.76. The N-Gain percentage indicates the extent to which the topics of index prices and inflation were covered in the Interactive Electronics module created using Flip PDF Professional. The N-Gain percentage obtained was 76.82, which falls within the "Effective" category.

## DISCUSSION

This research is an effort to improve the quality of learning with the aim of creating a product on the price index of materials and inflation for Year 11 students at YP Unila Senior High School in Bandar Lampung, using Flip PDF Professional based on an e-module with a QR code. The ADDIE model, developed by Reiser and Mollenda, was used as the development framework. It comprises five stages: analysis, design, development, implementation and evaluation. The ADDIE model was chosen for its methodical steps, its structure, and its ability to carry out evaluations at every stage of production. This ensures that the final product will meet user requirements as fully as possible.

### 1. Analysis Stage

To begin developing a solution to a problem, the analysis stage of the ADDIE model seeks to determine the nature of the problem, the learners' requirements, and the learners' characteristics. According to Branch & Varank (2009), when creating user-friendly learning materials, the findings of the analysis serve as a guide. The use of printed books, worksheets and lecturing techniques continues to dominate the price index of learning materials and inflation, according to the findings of observations and interviews at YP Unila Senior High School in Bandar Lampung. Students are not engaged in their own education due to the limited use of technology-based learning resources. Furthermore, some students find it difficult to understand the content because of the rather complex concepts surrounding the price index of materials and inflation.

This study supports the claim made by Hasan et al. (2021) that the purpose of educational media is to facilitate the presentation of complex concepts for the benefit of students. Furthermore, this study reveals that whilst the majority of students own smartphones, they do not make the best possible use of them for learning (Widiyani & Karsiwan, 2024). Therefore, to create a user-friendly and dynamic learning tool, the researchers developed an e-module using Flip PDF Professional and QR code integration. This development is in line with the view held by Nana (2022) that e-modules can facilitate self-directed learning by providing structured, interactive and adaptable content. Consequently, the findings from the analysis phase indicate that creating e-modules using Flip PDF Professional with QR codes is an effective way to address the cost of materials and inflation-related learning challenges.

2. Design Stage

The findings from the requirements analysis form the basis for the design stage of the product design process. At this stage, the design of the learning media is developed (Branch & Varank, 2009). This phase encompasses content preparation, visual design, learning techniques, and assessment tools. The electronic module for this study was

created using Flip PDF Professional and integrated with QR codes for the price index and inflation data. Storyboarding, visual design, navigation, and the integration of various multimedia components such as images, videos, exercises, and learning assessments form part of the design process, which involves structuring the material in accordance with the Learning Achievements (CP) and Learning Objectives (TP) of the Mandiri curriculum. Furthermore, learners can easily access the material and additional learning resources via digital devices using QR codes.

The media created for the e-module must be user-friendly, adaptable, self-directed, self-educational and self-contained, in accordance with the specifications set out by Nana (2022). This is supported by the perspective of Aprisha, Dayu, Khoiroh and Buniyana (2024), who emphasise that QR codes can facilitate efficient and easy access to educational resources. The outcome of the design process informs the development of an e-module that integrates text, video and audio into a single interactive learning platform. It is believed that this design will stimulate students' interest in learning about price indices and inflation, whilst also simplifying the learning process before they proceed to the product development stage.

3. Development Stage

The development phase involves taking an idea from the conceptual stage to a complete and usable educational product. According to Branch & Varank (2009), the aim of the development phase is to create a product that conforms to the design and to ensure product quality by having specialists validate it. The e-learning module for this study was created using the Flip PDF Professional application. It contains a number of multimedia elements, including text, images, instructional videos, practice questions, assessments and Quick Response (QR) codes, which students can use to quickly access supplementary materials. Flip PDF Professional was chosen for its ability to create engaging and dynamic learning materials, which in turn enhance student engagement. This makes sense, given Batubara's (2021) argument that Flip PDF Professional can transform PDFs into interactive flipbooks that help convey information in a more engaging and easily understandable way.

Prior to implementation, the developed product underwent validation by media, subject matter and language specialists to assess its practicality. An average score of 3.83 was awarded by media experts, 3.5 by subject matter experts, and 3.85 by language experts; according to the validation data, the 'highly suitable' category was defined by an aggregate average of 3.74. In terms of content, presentation, language, appearance, and the use of learning media, the findings indicate that the e-module has met the necessary criteria. The findings of the validation study reinforce the view of Arsyad (2021), who argues that high-quality learning media must adhere to certain standards regarding content quality, presentation, usability, and learner characteristics. These research results also corroborate the findings of Rohmah & Sakti (2022), who found that e-modules created using Flip PDF Professional are highly valid and can be practically applied in the classroom. Consequently, the e-module has met the suitability requirements of the development phase, enabling it to proceed to the implementation phase, during which its usability and effectiveness in the classroom will be evaluated.

4. Implementation Stage

To determine how useful and practical the e-module is for learning, the implementation stage involves the practical application of the items developed. The aim

of the implementation stage, as stated by Branch & Varank (2009), is to ascertain whether the learning resource can be utilised appropriately for its intended purpose by testing it directly with users. A trial of the e-module was conducted with teachers and 11th grade students at YP Unila Senior High School in Bandar Lampung as part of this research. In their survey responses, teachers and students rated the e-module as highly practical, indicating that the medium is user-friendly, aesthetically pleasing, and useful for providing students with a better understanding of the CPI and inflation.

Furthermore, the findings of the effectiveness test indicate that pupils' learning outcomes improved, as evidenced by a rise in the average pre-test score from 47.26 to 87.38 in the post-test, and an N-Gain of 76.82%, which falls within the 'effective' category. In line with this conclusion is the view of Syafei (2025), who defines practical learning media as user-friendly media capable of facilitating the achievement of learning objectives. Susilo, Ardianto, Romlah, Wirdaini, & Musta'inah (2023) found that by presenting dynamic and accessible content, media based on Flip PDF Professional can enhance pupils' attention and learning outcomes, lending credence to the findings of this study. Therefore, the results of the implementation phase indicate that the e-module designed is practical in nature and has successfully improved pupils' learning outcomes.

5. Evaluation Stage

The final phase of the ADDIE model is evaluation, which aims to determine whether the product created has achieved its development objectives and to assess the product's overall quality. To obtain feedback for improving the product, formative assessments are carried out at each stage of development (Branch & Varank, 2009). Data from expert validation, instructor feedback, student feedback and efficacy testing form the basis of this study's assessment, based on pre- and post-tests. The assessment findings indicate that the Electronics module, based on Flip PDF Professional with QR code integration, meets the three main requirements for product development: validity, practicality and effectiveness. Experts in the fields of media, content and language all gave their seal of approval to the product; instructors and students rated it as 'highly practical'; and an N-Gain score of 76.82% indicates that it improved students' learning outcomes, thereby proving its effectiveness.

The findings are consistent with Mayer's Multimedia Learning Theory (2009), which states that students retain more information when presented with a combination of text, images, video and multimedia than with text alone. These findings also corroborate the results of Rindaryati (2021) and Mujahida, Baderiah, & Iman (2026), who found that student engagement and retention were enhanced by using interactive e-modules built on the Flip PDF Professional platform. The e-modules developed meet the requirements for practical, effective and suitable economics learning materials on the topics of price indices and inflation. Consequently, it can be concluded that these findings are in line with the objectives of the research conducted.

## CONCLUSION

In this study, we successfully developed interactive teaching materials in the form of e-modules based on Flip PDF Professional, incorporating QR codes, for Grade 11 students at YP Unila Senior High School in Bandar Lampung, covering the topics of price indices and inflation, using the ADDIE development model (analysis, design, development, implementation and evaluation). Consequently, the e-module developed

was assessed as meeting the standards for valid, practical and effective teaching materials. The average rating from media experts was 3.83, from subject matter experts 3.55, and from language experts 3.85, resulting in an overall average of 3.74, thus categorising it as highly suitable for use in the learning process. Furthermore, the results of the practical trial showed that teachers' feedback was highly positive, with the material found to be user-friendly and providing optimal support for learning activities. In terms of effectiveness, the use of the e-module delivered excellent results for all pupils. Average marks improved from 47.26 to 87.38 across all tests, and the N-Gain achieved was 76.82%, which falls within the 'effective' category. This demonstrates that the E-Module, equipped with Flip PDF Professional and QR codes, assists in teaching concepts relating to prices and inflation, whilst creating engaging, flexible and interactive lessons that utilise digital technology. Consequently, this resource is well-suited for use as a teaching aid for economics among lower secondary school students.

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## REFERENCES

Alamsyah, A., Yuliani, E., Ramadhan, N. K., Rosdiah, R., & Sudirman, S. (2023). Efektifitas Penggunaan Media Pembelajaran Berbasis Canva terhadap Minat Belajar Siswa Di Mata Pelajaran Informatika. *Jurnal Guru Pencerah Semesta*, *1*(2), 77–87. https://doi.org/10.56983/gps.v1i2.603

Aprisha, S. I., Dayu, D. P. S. K., Khoiroh, H., & Buniyana, A. (2024). Pengaplikasian Digital Library Berbasis QR Code untuk Meningkatkan Kemampuan Literasi Membaca Siswa Sekolah Dasar. *Didaktik: Jurnal Ilmiah PGSD STKIP Subang*, *10*(03), 365–374.

Arifin, B., & Mu'id, A. (2024). Pengembangan kurikulum berbasis keterampilan dalam menghadapi tuntutan kompetensi abad 21. *DAARUS TSAQOFAH Jurnal Pendidikan Pascasarjana Universitas Qomaruddin*, *1*(2), 118–128.

Arsyad, A. (2021). *Media Pembelajaran (Edisi Revi)*. Jakarta: Rajawali Pers.

Batubara, H. (2021). *Media Pembelajaran Digital*. Bandung: Remaja Rosdakarya.

Branch, R. M., & Varank, İ. (2009). *Instructional Design: The ADDIE Approach* (Vol. 722). Springer.

Bustami, A., Suwindri, I., & K Karsiwan. (2023). Merancang Pembelajaran IPS berbasis PJBL dengan tema sejarah lokal dan Cagar Budaya (1st ed.). CV. Laduny Alifatama.

Hasan, M., Milawati, M., & Darodjat, D. (2021). *Media pembelajaran*. Klaten: Tahta Media Group.

Karsiwan, K., Sari, L. R., Lisdiana, A., & Hamer, W. (2023). Penguatan Pendidikan Karakter Melalui Pembelajaran IPS Berbasis Kearifan Lokal di Lampung. Journal of Social Science Education, 4(1), 39–52. https://doi.org/10.32332/social-pedagogy.v4i1

Karsiwan, K., Wardani, W., Lisdiana, A., Purwasih, A., Hamer, W., & Retno Sari, L. (2023). Sosialisasi Materi Kearifan Lokal Dalam Kurikulum Merdeka Pada Mata

Pelajaran IPS Bagi Guru di Kota Metro Lampung. Malaqbiq: Jurnal Pengabdian Kepada Masyarakat, 2(1), 12–22. https://doi.org/10.46870/jam.v2i1.513

Laksana, D. N. L., Qondias, D., & Oka, G. P. A. (2025). *Desain penelitian pengembangan pendidikan*. Penerbit NEM.

Mayer, R. E. (2009). Multimedia Learning Prinsip-Prinsip Dan Aplikasi. *Yogyakarta: Pustaka Pelajar*, *64*, 116.

Mayzar, A., & Karsiwan, K. (2024). Identifikasi Peninggalan Bersejarah Minak Braja Selebah Sebagai Sumber Belajar IPS. Journal Pendidikan Ilmu Pengetahuan Sosial, 16(2), 200–209. https://doi.org/10.37304/jpips.v16i2.17531

Mujahida, A., Baderiah, B., & Iman, B. (2026). Pengembangan E-Modul Materi Pemulasaraan Jenazah Berbantuan Flip PDF. *Jurnal Riset Dan Inovasi Pembelajaran*, *6*(1), 48–63. Https://Doi.Org/10.51574/jrip.v6i1.4312

Mukarromah, A., & Andriana, M. (2022). Peranan Guru Dalam Mengembangkan Media Pembelajaran. *Journal of Science and Education Research*, *1*(1), 43–50. Https://Doi.Org/10.62759/jser.v1i1.7

Nana. (2022). *Pengembangan Bahan Ajar Digital*. Bandung: Remaja Rosdakarya.

Pendit, P. L. (2003). Penggunaan Teori dalam Penelitian Ilmu Perpustakaan & Informasi. *JIP UI*, 1–37.

Putri, D. N. S., Islamiah, F., Andini, T., & Marini, A. (2022). Analisis Pengaruh Pembelajaran Menggunakan Media Interaktif Terhadap Hasil Belajar Siswa Sekolah Dasar. *Jurnal Pendidikan Dasar Dan Sosial Humaniora*, *2*(2), 363–374.

Rindaryati, N. (2021). E-Modul Counter Berbasis Flip Pdf pada Mata Pelajaran Penerapan Rangkaian Elektronika. *Jurnal Imiah Pendidikan Dan Pembelajaran*, *5*(2), 192. https://doi.org/10.23887/jipp.v5i2.31240

Rindrayani, S. R., Rustiyana, R., Judijanto, L., Abdullah, G., & Ardiyanti, A. D. (2025). *Metode Penelitian dan Pengembangan: R&D Research and Development*. PT. Sonpedia Publishing Indonesia.

Ritonga, A. P., Andini, N. P., & Iklmah, L. (2022). Pengembangan Bahan Ajaran Media. *Jurnal Multidisiplin Dehasen (MUDE)*, *1*(3), 343–348.

Rohmah, Y. L., & Sakti, N. C. (2022). Pengembangan Modul Elektronik Interaktif menggunakan Flip PDF Profesional Pada Materi Lembaga Jasa Keuangan dalam Perekonomian kelas X IPS SMA. *JEKPEND: Jurnal Ekonomi dan Pendidikan*, *5 (2), 52*. https://doi.org/10.26858/jekpend.v5i2.34514

Sardi, A. I., Muchtar, A., & Makhshun, T. (2025). Flipbook Digital Dalam Pembelajaran Pai: Inovasi Media Pembelajaran Kreatif Untuk Meningkatkan Minat Dan Hasil Belajar Siswa. *Jurnal Literasiologi*, *13*(2) 182-201. https://doi.org/10.47783/literasiologi.v13i2.924

Simanjuntak, L. C. R., & Hidajat, F. A. (2025). Systematic Literature Review: Transformasi Pembelajaran dengan E-Modul Interaktif berbasis Problem Based Learning untuk Meningkatkan High Order Thinking Skills. *Jurnal Riset Pendidikan Matematika Jakarta*, *7*(2), 139–148. https://doi.org/10.21009/jrpmj.v7i2.60815

Sugiyono. (2024). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta.

Susilo, A., Ardianto, B., Romlah, S., Wirdaini, M., & Musta'inah, M. (2023). Penerapan Media Pembelajaran Digital Flipbook Untuk Meningkatkan Hasil Belajar Siswa. *Prosiding Seminar Nasional Pendidikan*, *5*(5), 1–7.

Syafei, I. (2025). *Media Pembelajaran*. Penerbit Widina.

Wardani, H. K., Pramartaningthyas, E. K., Rohman, T., & Alimin, A. (2025). Development of Interactive E-Module to Foster EFL Students' Critical Thinking in Essay Writing. *Jurnal Kependidikan: Jurnal Hasil Penelitian Dan Kajian Kepustakaan Di Bidang Pendidikan, Pengajaran Dan Pembelajaran*, *11*(1), 190. https://doi.org/10.33394/jk.v11i1.13577

Waruwu, M. (2024). Metode Penelitian dan Pengembangan (R&D): Konsep, Jenis, Tahapan dan Kelebihan. *Jurnal Ilmiah Profesi Pendidikan*, *9*(2), 1220–1230. https://doi.org/10.29303/jipp.v9i2.2141

Widiyani, P. N., & Karsiwan, K. (2024). Efektivitas Model Pembelajaran Problem Based Learning terhadap Kepekaan Sosial Siswa pada Pembelajaran IPS Kelas VIII MTs Nurul Iman. IJTIMAIYA: Journal of Social Science Teaching, 8(2), 16–24. https://doi.org/10.21043/ji.v8i2.26766

Yulfiani, N., & Karsiwan, K. (2025). Penguatan Karakter Peduli Lingkungan melalui Program Budaya Positif Era Gen Alpha di SMP Negeri 4 Metro. Jurnal Pendidikan Dan Pembelajaran Indonesia (JPPI), 5(4), 2160–2174. https://doi.org/doi.org/10.53299/jppi.v5i4.2795

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