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THE DEVELOPMENT OF THE 'MYSTERY BOX' METHOD IN SCIENCE EDUCATION TO ENHANCE LEARNING MOTIVATION AMONG PRIMARY SCHOOL STUDENTS

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ABSTRACT
IPAS teaching in primary schools tends to be teacher-centred, meaning that pupils' motivation to learn is not yet optimal. The lack of variety in teaching materials results in limited pupil engagement in the learning process. This study aims to (1) analyse the IPAS learning process, (2) develop the 'Mystery Box' teaching aid, and (3) test the effectiveness of this teaching aid in enhancing pupils' motivation to learn. The study employed the 4D model of research and development, comprising the Define, Design, Develop, and Disseminate stages. The research subjects consisted of an experimental class at SDN 01 Delingan and a control class at SDN 04 Bejen. Data collection techniques included observation, learning motivation questionnaires, interviews, and documentation. The results indicated that the Mystery Box medium is suitable based on validation by media experts, subject matter experts, and language experts. The results of the effectiveness test showed that student learning motivation in the experimental class was higher than in the control class in terms of the indicators of learning perseverance, active engagement, perseverance in the face of difficulties, interest in the material, and a positive attitude towards learning. The study showed that the Mystery Box medium is effective in enhancing student learning motivation

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INTRODUCTION

Learning motivation is regarded as one of the key factors determining the success of the learning process for primary school students. Learning motivation is reflected in students' interest, attention and active engagement in learning activities (Safna & Wulandari, 2022). Low learning motivation is often characterised by a lack of enthusiasm among students in participating in lessons, limited engagement, and a lack of perseverance in completing

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tasks. These conditions indicate that efforts to enhance learning motivation must be prioritised in instructional design to ensure the learning process is effective and meaningful.

Learning media are regarded as tools that play a role in supporting the creation of engaging and interactive learning processes (Fadilah et al., 2023). The use of learning media appropriate to the characteristics of primary school students can help facilitate understanding of the material and increase students' interest in learning. Concrete and challenging learning media enable students to be actively involved in the learning process (Chandra et al., 2023). Therefore, the development of innovative learning media such as the Mystery Box in IPAS lessons is expected to create an enjoyable learning experience and encourage an increase in the learning motivation of primary school students.

Evidence from the field shows that the IPAS learning process in primary schools is still dominated by teacher-centred learning. Learning generally takes place through verbal explanations of the material and the use of textbooks as the primary learning resource. Pupils' activities in IPAS lessons appear to be limited to listening and note-taking. This situation has led to low student motivation, characterised by a lack of enthusiasm, minimal active engagement, and low perseverance in following the lessons. A similar situation was also found in IPAS learning at SDN 04 Bejen, which served as the control class in this study.

IPAS learning at SDN 01 Delingan, as the experimental class, also faced issues regarding student motivation. The use of innovative learning media has not yet been optimally utilised to support the learning process. IPAS material, which is abstract and conceptual in nature, is often difficult for students to understand if not supported by concrete and engaging media. These conditions highlight the need for the development of learning media capable of actively engaging students and fostering curiosity, so that students' motivation in IPAS learning can be enhanced through the use of the Mystery Box.

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Although various studies have shown that the use of innovative learning media can enhance the learning motivation of primary school pupils, research specifically developing and testing the Mystery Box medium in IPAS learning remains limited. Most studies have focused on the use of general-purpose media without undergoing a systematic development process tailored to the characteristics of IPAS material and the needs of primary school pupils. In-depth analysis of the effectiveness of exploration-based learning media specifically designed to enhance pupils' motivation in IPAS learning has not been widely explored (Ikhbal & Musril, 2020). This situation indicates a research gap that requires further investigation through the development of the Mystery Box medium in IPAS learning in primary schools.

Research by Rejeki et al. (2020) shows that the use of innovative learning media has a positive influence on the learning motivation of primary school pupils. Learning media that are concrete, interactive and challenging are reported to be capable of increasing pupils' attention, interest and active engagement in the learning process. Research by Arlianda et al. (2022) revealed that in IPAS and science lessons in primary schools, learning media involving exploration and problem-solving activities can help pupils understand abstract concepts and encourage curiosity. Pupils' learning motivation was reported to increase when lessons were delivered through media that provided hands-on learning experiences.

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Research by Yusup et al. (2021) indicates that learning media based on educational games, exploratory teaching aids, and surprise-based media can create an enjoyable learning atmosphere. Media designed with elements of challenge and concept-discovery activities are reported to be effective in enhancing students' perseverance, active engagement, and positive attitudes towards learning. Findings by Mahlianurrahman & Aprilia (2022) indicate that the development of learning media emphasising exploration and interaction holds great potential for enhancing primary school students' motivation to learn.

The novelty of this study lies in the development of the Mystery Box, a teaching aid designed contextually and systematically specifically for science education in primary schools, with a focus on enhancing pupils' motivation to learn. The Mystery Box was developed not merely as a teaching aid, but as an exploratory tool that encourages pupils' active engagement through activities involving guessing, observing and discovering scientific concepts first-hand. This study also integrates the use of the Mystery Box with a comprehensive measurement of student learning motivation indicators, thereby providing an empirical picture of the effectiveness of exploration-based learning media, which has been limited in previous research.

This study aims to analyse the IPAS learning process in primary schools in relation to student learning motivation, to develop the Mystery Box as an IPAS learning medium suited to the characteristics and needs of primary school students, and to test the effectiveness of the Mystery Box in enhancing the learning motivation of primary school students.

METHOD

This study employs a research and development (R&D) methodology. The research focuses on the development of the Mystery Box teaching aid for IPAS lessons to enhance the learning motivation of primary school pupils. The development model used is the 4D model, which comprises the Define, Design, Develop and Disseminate stages. This model was chosen because it provides a systematic and structured framework for the development of teaching aids.

The Define stage was carried out to analyse IPAS learning needs, student characteristics, and issues arising in the learning process relating to student learning motivation. The Design stage was carried out to design the Mystery Box media, which included determining learning objectives, designing media content, compiling learning activities, and designing research instruments. The Develop stage involves the creation of the Mystery Box media product, which is then validated by media experts, IPAS subject matter experts, and language experts to assess the media's suitability. The Disseminate stage involves pilot testing and the implementation of the media in IPAS learning to test the effectiveness of the Mystery Box media in enhancing students' learning motivation.

The research subjects comprised two groups: the experimental class and the control class. The experimental class consisted of pupils at SDN 01 Delingan who received IPAS lessons using the Mystery Box. The control class consisted of pupils at SDN 04 Bejen who received IPAS lessons without using the Mystery Box. Data collection techniques included observation, a learning motivation questionnaire, interviews and documentation. Data analysis was carried out using descriptive qualitative and quantitative methods to assess the suitability of the medium and the effectiveness of using the Mystery Box medium in improving the learning motivation of primary school students

RESULT AND DISCUSSION

Results

The results of the observations indicate that the IPAS learning process in elementary schools still tends to be teacher-centered. The material is delivered through direct explanations and the use of textbooks as the primary learning resource. Student activities during lessons are relatively limited to listening, taking notes, and completing written assignments. Students' active engagement in the learning process has not yet been fully realized.

Interview results with teachers indicate that student motivation in IPAS remains low. This is characterized by a lack of student attention during lessons, low participation in question-and-answer sessions, and difficulty

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understanding abstract material. Teachers also noted that the limited use of learning media results in students having little interest in the material presented.

The assessment of the Mystery Box media's suitability was conducted by three validators, comprising a media expert, a content expert, and a language expert. The validation focused on the alignment of the IPAS content, the media's design and presentation, language usage, the media's usability, and its potential to enhance student learning motivation.

The validation results indicate that the Mystery Box media received a rating of "highly suitable" for use in IPAS instruction. A summary of the validation results is presented in the table below

Table Results of the Mystery Box Media Validation

No	Evaluation Aspect	Media Expert	Content Expert	Language Expert	Average	Kategori
1	Relevance of IPAS content	-	4,30	-	4,30	Content suitability
2	Media design and presentation	4,40	-	-	4,40	Content suitability
3	Language and Readability	-	-	4,25	4,25	Content suitability
4	Media Usability	4,35	4,30	4,20	4,28	Content suitability
5	Potential to Increase Motivation	4,40	4,35	4,30	4,35	Content suitability
	Overall Average				**4,32**	**Content suitability**

DISCUSSION

The results of the observation indicate that IPAS instruction is still dominated by conventional, teacher-centered teaching methods. This situation results in students being less actively engaged in the learning process. Low student participation during learning activities suggests the need for more engaging instructional media that can encourage direct student involvement.

The research findings also indicate that student motivation remains relatively low. The lack of variety in learning media makes it difficult for students to understand abstract material. Therefore, the development of the Mystery Box as a learning medium serves as an alternative to create a learning experience that is more engaging, interactive, and aligned with the characteristics of elementary school students.

The results of the expert validation indicate that the Mystery Box media has a very high level of suitability. The overall average score of 4.32 indicates that the media meets the suitability criteria in terms of content, media, and language. The high scores in the design and presentation aspects indicate that the visual elements in the media are effective in capturing students' attention and supporting the learning process.

The content suitability aspect, which received a score of 4.30, indicates that the media's content aligns with the IPAS learning objectives. The language and readability aspect received a score of 4.25, indicating that the language used is easily understood by elementary school students. The usability aspect received a score of 4.28, indicating that the media is easy to use in the learning process.

A score of 4.35 in the aspect of increased learning motivation indicates that the Mystery Box medium has strong potential to boost students' interest and enthusiasm during learning. These findings demonstrate that the use of media incorporating visual elements, exploratory activities, and enjoyable learning experiences can have a positive impact on students' learning motivation.

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Overall, the validation results prove that the Mystery Box medium is suitable for use in IPAS learning and has the potential to be an effective medium for enhancing elementary school students' learning motivation. Thus, this medium can serve as an innovative learning alternative that supports the creation of more active, engaging, and meaningful learning experiences.

CONCLUSION

Based on the research findings and discussion, it can be concluded that the IPAS learning process in elementary schools still tends to be teacher-centered, with student involvement that is not yet optimal. This situation results in low student motivation in IPAS learning. Therefore, there is a need to develop learning media capable of actively engaging students and fostering their motivation to learn.

The development of the Mystery Box media using the 4D model resulted in learning media deemed highly suitable based on the validation results from media experts, subject matter experts, and language experts. The Mystery Box media is capable of presenting IPAS material in an engaging, contextual manner, and in line with the characteristics of elementary school students. The results of the effectiveness test indicate that the use of the Mystery Box media is effective in increasing students' learning motivation, as evidenced by higher learning motivation scores in the experimental class compared to the control class across all learning motivation indicators.

Thus, the Mystery Box media can be used as an alternative IPAS learning medium to enhance the learning motivation of elementary school students.

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