

Identification And Analysis Of The Needs For The Development Of Integrated Ipas Learning Management Approach Mindful, Meaningful, Joyful Learning With Ict Multimedia In Elementary Schools Of Tuban Regency

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Abstract

This study identifies and analyses the needs for developing IPAS (Natural and Social Sciences) learning management that integrates the Mindful, Meaningful, and Joyful Learning (MMJ Learning) approach with ICT multimedia in elementary schools in Tuban Regency. Although previous studies have examined ICT integration, school-based mindfulness, and meaningful or joyful learning separately, few have addressed how these three dimensions can be managed together within a single, technology-supported instructional design for primary science; this study addresses that gap. A mixed-methods design was used, combining descriptive quantitative analysis of teacher and student questionnaires with thematic analysis of interviews, observations, and documents across six schools (12 teachers and 60 students). The central finding is a persistent gap between the readiness of ICT facilities and teachers' pedagogical capacity to integrate them: school facilities are largely adequate, yet teachers' ability to integrate ICT into learning remains only moderate, and the available teaching tools rarely accommodate the mindful dimension. Students, in turn, strongly prefer visual, interactive, and experiential learning over text. The study's main contribution is an evidence-based, three-component development framework—resources, MMJ-multimedia learning design, and collaboration—creativity outcomes—that reframes the problem from device provision to learning management. Accordingly, it recommends developing modular ICT multimedia that embeds reflective (mindful), contextual (meaningful), and enjoyable (joyful) activity flows, supported by explicit time-management and collaboration scaffolds.

Keywords: Mindful Meaningful Joyful Learning, Interactive Multimedia, Needs Analysis, Learning Management, Elementary School.

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1. INTRODUCTION

The curriculum in elementary schools demands learning that not only emphasizes mastery of content, but also builds *21st Century Competence* such as collaboration and creativity. Social studies subjects in grade V are positioned to help students understand the relationship between natural–social phenomena while practicing scientific, contextual, and problem-solving-oriented ways of thinking. However, learning practices in the field often show the distance between these demands and students' learning experiences. The data of this study shows that social studies learning in elementary schools in Tuban Regency still tends to be conventional (Apridar et al., 2024), is relatively teacher-centric, and has not optimally utilized multimedia and ICT devices that are actually available (Hirshberg et al., 2020).

In the context of digital transformation of education, ICT (Information and Communication Technology) integration is no longer just an option, but an enabler to develop visual, interactive, and adaptive learning. The study of digital technology in education confirms that digitalization changes the role of teachers, the character of learning activities (Liang et al., 2022), as well as opening a variety of learning strategies based on multimodal learning resources (Haleem et al., 2022). However, the literature also consistently states that the availability of technological devices has not automatically become an effective pedagogical practice (Gupta & Goel, 2024); There is a need for instructional design, teacher capacity building, and learning management models that guide meaningful technology integration (Putriyani et al., 2024) (Fabian et al., 2024).

To answer the monotonous learning problem and low student involvement, this study proposes the integration of the Mindful, Meaningful, and Joyful Learning (MMJ Learning)

approach as a framework for managing IPAS learning. Conceptually:

1. Mindful learning emphasizes the student's full awareness, attention, and reflection during the learning process (Bordunos et al., 2024) (Indriaswuri et al., 2023). Systematic review of *mindfulness-based school interventions* shows that mindfulness interventions in schools have the potential to improve students' attention, executive function, resilience, and social-emotional aspects (Phan et al., 2022).
2. Meaningful learning requires a connection between concepts and students' life experiences so that learning is contextual and useful (Hamid et al., 2024) (Zhakypova et al., 2021).
3. Joyful learning emphasizes a fun learning experience, sparks curiosity, and increases intrinsic motivation. In international literature, discourse *active/playful learning* Reinforces that an active and enjoyable learning experience is related to student engagement and the development of diverse competencies (Blinkoff et al., 2023).

MMJ Learning is relevant for IPAS learning because of the character of IPAS which ideally combines exploration, observation, discussion, group work, and interpretation of the reality of the surrounding environment. However, the challenge lies in how teachers can manage the learning process in a structured, flexible, and consistent manner presenting the three aspects of MMJ in an integrated manner. The data of this study confirms that teachers do not yet have teaching/multimedia tools that integrate the MMJ aspect comprehensively, especially in the *mindful aspect*.

Multimedia ICT has the potential to bridge the needs of visual and interactive science learning (Kelwarany et al., 2024) (Maun et al., 2022). But the effectiveness of multimedia is not automatic; The design should consider cognitive load, segmentation, emphasis on relevant information, and narrative–visual synchronization. Concise and targeted instructional video design guidelines, for example, have been shown to increase learning effectiveness when videos are treated with specific principles (Phan et al., 2022).

On the other hand, if multimedia is designed for collaboration and creativity for example, through digital projects, *Digital Storytelling*, or technology-based products then learning can develop students' social skills and creative thinking. Studies on *Digital Storytelling* Demonstrate potential in encouraging creativity (Ijiga et al., 2021) and teamwork on technology-based science activities (Chen et al., 2023) (Wan Mohd Nasir et al., 2024).

Among the available technological options, ICT-based multimedia is arguably the most suitable vehicle for operationalising the MMJ approach in IPAS learning, for three reasons. First, multimedia can represent the same natural and social phenomena through complementary visual, auditory, and interactive channels, which directly supports the *meaningful* dimension by linking abstract concepts to students' lived contexts. Second, interactive and game-like features sustain attention and positive affect, providing a natural medium for the *joyful* dimension without sacrificing learning goals. Third, multimedia can be paused, segmented, and annotated, allowing teachers to insert reflective stops, guiding questions, and short journaling tasks that make the *mindful* dimension explicit and manageable. In other words, multimedia is not merely a presentation aid but a structuring medium through which the three MMJ aspects can be sequenced and managed within a single lesson something that print or single-mode media cannot easily achieve.

Despite this potential, the existing literature reveals a clear research gap. Studies on ICT integration tend to emphasise infrastructure provision and general technological competence, yet repeatedly report that access alone does not translate into effective pedagogical use. Research on school-based mindfulness, meaningful learning, and joyful or playful learning has largely developed along separate tracks, each treating its dimension in isolation. Consequently, there is limited empirical guidance on how the mindful, meaningful, and joyful dimensions can be integrated and managed simultaneously through ICT multimedia, particularly at the elementary level and within the relatively new IPAS subject in the Indonesian context. Prior needs analyses also tend to stop at documenting facility availability and teacher interest, without diagnosing why a readiness practice gap persists or how it should inform learning-management design.

This study therefore positions its novelty in three respects. First, it integrates the three MMJ dimensions into a single learning-management framework for IPAS rather than treating them separately. Second, it grounds that framework in a multi-source needs analysis triangulating teacher and student questionnaires, interviews, observations, and documents across six schools so that the proposed design is empirically driven rather than purely conceptual. Third, it reframes the development target from providing devices to managing learning, identifying the mindful dimension and teachers' pedagogical integration capacity as the specific leverage points that earlier studies have largely overlooked.

Building on this gap and novelty, the present study aims to identify and analyse the needs for developing MMJ-integrated, ICT-multimedia-based IPAS learning management in elementary schools in Tuban Regency. Specifically, it examines teachers' needs for MMJ- and ICT-based IPAS learning, students' needs for interactive and enjoyable learning, the readiness of school ICT facilities, and the obstacles to implementing technology-based IPAS learning, and on this basis it formulates evidence-based recommendations for developing MMJ-based IPAS learning management.

2. RESEARCH METHODS

2.1 Research design

The research uses mixed methods with quantitative descriptive and qualitative descriptive orientations. The quantitative approach is used to photograph the tendency of needs through the percentage of questionnaire results, while the qualitative approach is used to deepen the meaning of needs and constraints through interviews and observations that are thematically analyzed.

2.2 Location and subject matter

The research was carried out in 6 elementary schools in Tuban Regency. Subjects include 12 teachers (classroom teachers/science teachers/principals as informants in interviews according to the school context), and 60 students. The selection of subjects was carried out through purposive sampling by considering the regional representation and condition of the school's ICT infrastructure.

2.3 Data collection techniques and instruments

Data is collected through:

1. Questionnaire of teacher and student needs: photographing technology readiness, multimedia experience, learning preferences, and perception of MMJ Learning.
2. Open interview: exploring the experience of teachers/principals about the constraints and needs of teaching tools/learning management.
3. Observation: observing the learning practices of social studies and ICT facilities.
4. Documentation study: examining the IPAS curriculum, lesson plans, and infrastructure data.

To ensure measurement quality, the research instruments were developed systematically from the study's conceptual framework. The teacher and student questionnaires were derived from indicators of the three MMJ dimensions, ICT-integration capacity, facility readiness, and learning obstacles, and were arranged using a structured response format. Content validity was established through expert judgement: specialists in elementary education and educational technology reviewed each item for relevance, clarity, and representativeness, and the items were refined according to their suggestions before use. Item clarity and internal consistency were checked during a preliminary tryout so that ambiguous or redundant items could be revised or removed. The interview and observation guides were likewise validated by experts to confirm that the questions and observation points were aligned with the research objectives and could elicit the intended information on needs and constraints.

2.4 Data analysis techniques

The questionnaire data was analyzed by percentage analysis (%) to display the tendency of respondents' answers. Interview and observation data were analyzed using thematic analysis, which grouped statements into needs themes (for example: the need for management

guidance, interactive multimedia, training, time management, collaborative activities, creativity space).

The quantitative and qualitative data were not analysed in isolation but integrated within a convergent mixed-methods logic. The quantitative questionnaire results were used to map the magnitude and distribution of needs, that is, how widely a particular readiness condition or need was shared across teachers and students, while the qualitative interview, observation, and documentation data were used to explain why those needs arose and how they were experienced in practice. The two strands were merged at the interpretation stage, organised around each research objective: for every objective, the statistical tendency was juxtaposed with the corresponding themes from the qualitative data. Points of convergence, where the numbers and the narratives pointed in the same direction, were treated as well-supported needs, whereas points of divergence, such as adequate facility availability coexisting with limited classroom integration, were flagged as critical issues requiring deeper interpretation in the discussion.

2.5 Data validity

The research applied triangulation methods by combining questionnaires, interviews, observations, and documentation to strengthen the consistency of findings. The themes of needs are juxtaposed with evidence of classroom practice and the condition of school facilities (Ardyan et al., 2023).

The trustworthiness of the qualitative component was addressed through several strategies. Credibility was strengthened by method triangulation, combining questionnaires, interviews, observations, and documentation, and by comparing findings across the six schools to identify consistent and divergent patterns. Dependability and confirmability were supported by maintaining an audit trail of raw data, coding decisions, and analytic memos, so that the route from evidence to theme could be retraced. Transferability was facilitated by providing thick descriptions of the school contexts, participants, and conditions, allowing readers to judge the applicability of the findings to comparable elementary-school settings.

3. RESULTS

This section presents empirical findings based on questionnaires, interviews, and observations at 6 elementary schools in Tuban Regency. All figures and descriptions of the results are research data as stated in the research document.

3.1 Teacher readiness and availability of ICT facilities

The results of the survey show the following profile of teacher readiness and ICT facilities. Teacher readiness and ICT facilities are depicted in the following bar chart

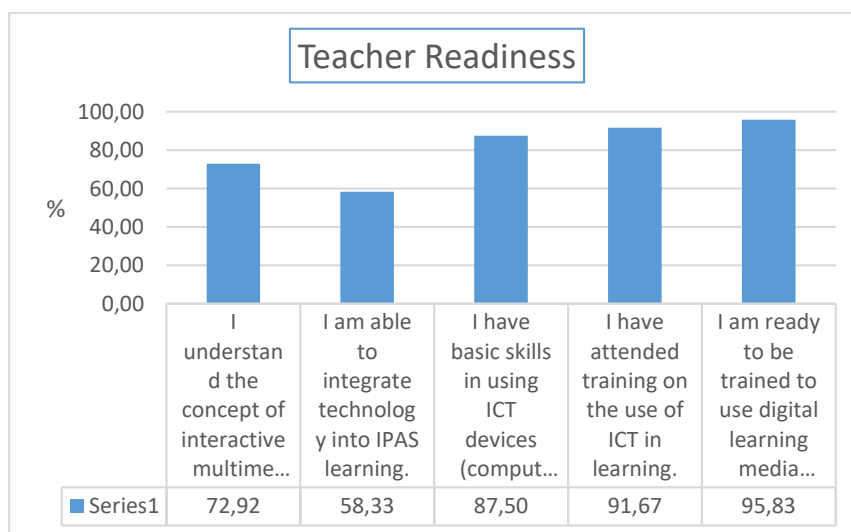


Figure 1. Bar Chart of Teacher Readiness Survey Results

- 95.83% of teachers stated that they were ready to receive training on the use of digital learning media for IPAS.
- 91.67% of teachers have participated in ICT training.
- 87.50% of teachers have basic ICT skills.
- However, only 58.63% were able to integrate ICT in science learning.
- 72.93% of teachers understand the concept of interactive multimedia-based learning.

From the means side:

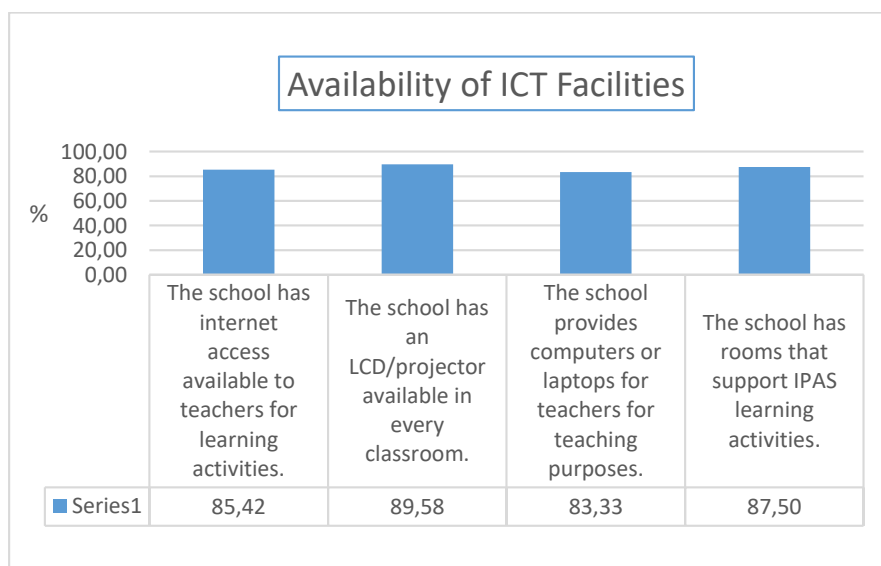


Figure 2. Bar Chart of ICT Facility Availability

- 83.33% of respondents stated that schools provide laptops/computers.
- 89.58% stated that schools have LCDs/projectors in every classroom.
- 85.42% stated that internet access is available and accessible to teachers.
- 87.50% stated that schools have rooms to support social studies learning

Interpretation of needs: there is a *gap* between ICT training readiness and experience and the ability to implement ICT integration in the classroom. In other words, the key factor is not only the availability of devices, but how teachers manage science learning so that ICT becomes part of the pedagogical strategy, not just a presentation tool.

These results warrant interpretation beyond their descriptive surface. The coexistence of well-equipped schools with only moderate ICT-integration capacity indicates that the bottleneck is pedagogical rather than infrastructural: the limiting factor is not the availability of devices but teachers' capacity to embed them within a coherent instructional design. A plausible explanation is that earlier exposure to technology and training has been largely procedural, focused on operating devices, rather than pedagogical, focused on orchestrating mindful, meaningful, and joyful learning experiences. This reading is consistent with the finding that teachers feel ready and well-resourced yet still struggle to design meaningful and enjoyable IPAS lessons. The readiness–practice gap is therefore best understood as a need for learning-management support, structured designs, models, and guidance, rather than for additional hardware.

Table 1.
Summary of teacher readiness and ICT facilities (questionnaire results)

Indicator	Percentage (%)	Development needs
Ready to receive digital media training	95,83	Priority of ICT-MMJ integration practical training program

Have participated in ICT training	91,67	Initial capital is available, it is necessary to <i>follow up classroom-based coaching</i>
Have basic ICT skills	87,50	Relatively adequate operational competency base
Able to integrate ICT in learning	58,63	Need for a learning management model and ready-to-use teaching tool examples
Understand the concept of interactive multimedia	72,93	Need to strengthen multimedia instructional design
The school provides laptops/computers	83,33	Sufficient infrastructure; Utilization optimization is the focus
LCD/projector available per class	89,58	High potential for visual media implementation
Internet available & accessible to teachers	85,42	Adequate access support for curated digital content

Source: Survey results in 6 elementary schools in Tuban Regency (July 2025).

3.2 Teachers' needs for multimedia learning of IPAS based on MMJ and ICT

A survey of teachers' needs for multimedia learning in IPAS shows. Teachers' Needs for Multimedia Learning in Social Studies

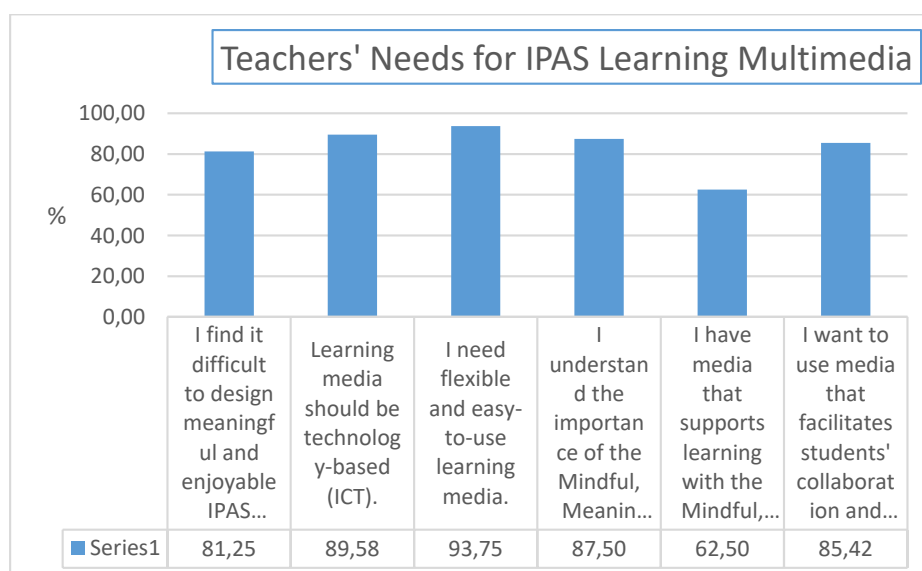


Figure 3. Results of the Teacher Needs Survey for Multimedia Science Learning

- 93.75% of teachers need flexible and easy-to-use learning media.
- 89.58% of teachers stated that learning media should be technology-based.
- 85.42% of teachers want media that facilitates the improvement of students' collaboration skills and creativity.
- 87.50% of teachers understand the importance of the MMJ approach in IPAS.
- However, only 62.50% of teachers have multimedia that supports MMJ; and
- 81.25% of teachers stated that it was difficult to design meaningful and fun social studies learning.

Core needs: teachers need multimedia that is (1) easy to operate, (2) relevant to the student's daily context (*meaningful*), (3) fun and encourages participation (*joyful*), and (4) provides space for reflective/mindful pause.

Table 2.
Summary of teachers' needs for multimedia IPAS

Statement of teacher needs	Percentage (%)	Implications of multimedia design & learning management
Requires flexible and easy-to-use media	93,75	Simple interface, can be used in a variety of classroom conditions
Media should be technology-based	89,58	Integration of school ICT devices: LCD, laptop, internet
Media supports collaboration & creativity	85,42	Group activities, projects, creative <i>prompts</i> , digital products
Understanding the importance of MMJ in IPAS	87,50	Need <i>for</i> guidelines for the implementation of MMJ in the RPP & class flow
Already has multimedia that supports MMJ	62,50	Media availability gap: need for integrated package development
Difficulty planning meaningful & enjoyable learning	81,25	Time management templates, activity scenarios, and content banks are needed

Source: Results of teacher questionnaires in 6 elementary schools (July 2025).

3.3 Students' preferences for social studies learning

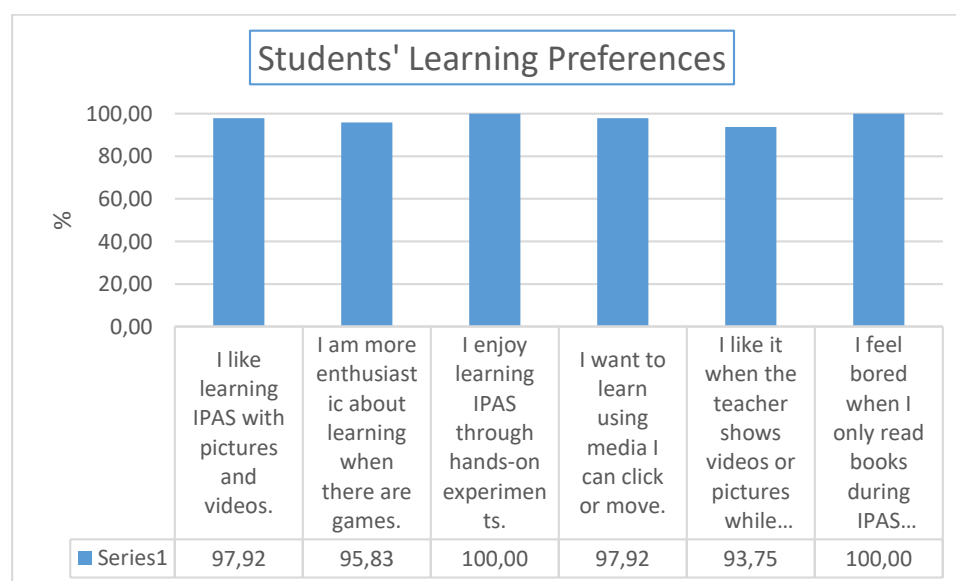


Figure 4. Survey Results on Student Preferences for Social Science Learning

The results of the questionnaire and observation showed the preferences of the students:

- Students are more enthusiastic about learning social studies with pictures or videos.
- Students love learning that involves interactive multimedia, hands-on experiments, and educational games.
- 100% of students say they are bored if they only read books during social studies learning.

These findings signal a strong need to design multimodal learning experiences: visual audio interactive experiential. These preferences align with the direction of effective learning video design (e.g., segmentation, emphasis on important information, and narrative–visual synchronization) recommended in video-based learning design research (Rongbutsri et al., 2023).

Table 3.
Student preferences and implications of learning activities

Student preferences (questionnaire/observation)	Indication of needs	Examples of forms of activities in ICT multimedia
Like images/videos	Dominant visual content	Short videos of local IPAS phenomena; infographics; Animation
Love interactive multimedia	Active engagement	Interactive quizzes; simple simulations; <i>drag-and-drop</i>
Likes experiments	Live experience	Guided experiment worksheets and demonstration videos
Love educational games	Fun element	Simple gamification: points, badges, group challenges
100% bored if you only read books	Strategy transformation	The book material is mapped into media-based activities

Source: Student data (60 respondents) and classroom observation (July 2025).

3.4 The need for MMJ integration in IPAS learning management

The survey shows important findings regarding MMJ integration:

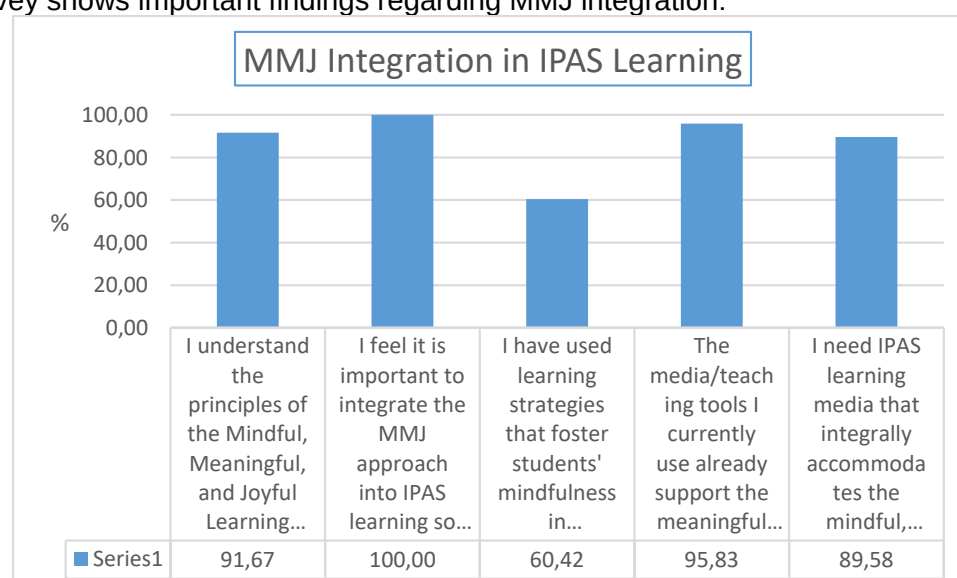


Figure 5. Survey results on the need for MMJ Integration in Social Science learning management

- 100% of teachers stated that *mindful-meaningful-joyful integration* is important in IPAS learning management to build students' emotional connection with the material.
- 95.83% of teachers stated that the current teaching media/tools have not accommodated the *mindful aspect*, even though it has relatively supported *the meaningful and joyful* aspects.
- 89.58% of teachers need IPAS media that is integrated to accommodate MMJ.
- Only 60.42% of teachers stated that they had used strategies that encourage student *mindfulness* in IPAS activities in the classroom.

These findings indicate that the *Mindful* is the most prominent weak point in the existing teaching tool, so the development of learning management needs to include the reflection/attention mechanism as a mandatory component. The literature suggests that mindfulness interventions in schools can contribute to attention, impulse control, and emotional regulation of components that support learning perseverance and positive social interactions (Elzohairy et al., 2024).

3.5 Interview findings: cross-school needs theme

Interviews at six schools showed a consistent need: teachers need structured yet flexible IPAS learning management guidelines, interactive media that helps with time and activity management, systems that support collaboration, and ICT teaching tools that are easily accessible to students. The following is a thematic summary based on interview excerpts.

Table 4.
Results of identification of needs through (thematic) interviews

School	Resource Persons	Interview excerpts (concise)	Focus needs
Elementary School Kebonsari	Grade V Teacher	Clear guidance is needed so that learning is structured but flexible; Mindful & Joyful integration will increase emotional engagement	MMJ-based learning management guide
SDN Remen 2	Science Teacher	Time and activity management challenges; MMJ-based interactive media will help to set up meaningful and fun learning	Structured interactive media for time management
SDN Campurejo	Principal	Students' creativity needs to be facilitated; Digital media opens up exploration but needs training and systems for collaboration	Digital systems for collaboration and training
SDN Hargoretno	Grade VI Teacher	The child is visual and kinesthetic; need meaningful multimedia for abstract concepts; The integration of MMJ is practical.	Integrative and applicative multimedia
SDN So	Science Teacher	Mindful essential: environmental and project observation; need media that guides the flow and provides space for creativity	Media guides collaborative–exploratory activities
SDN Mentoso	Grade IV Teacher	We need teaching tools that encourage active-creativity; ICT must be easily accessible to all students	Inclusive and easy-to-use ICT teaching tools

Source: Interview at 6 SD (July 2025).

The interview evidence illustrates and deepens this interpretation. A grade V teacher emphasised the need for guidance that keeps learning structured yet flexible, expecting the integration of the mindful and joyful dimensions to raise students' emotional engagement. A science teacher pointed to the difficulty of managing time and classroom activities, anticipating that structured, MMJ-based interactive media would help organise meaningful and enjoyable lessons. A school principal stressed the importance of facilitating students' creativity, noting that digital media open up exploration but require accompanying training and a system to support collaboration. Across schools, these voices converge on the same underlying requirement: media and management designs that guide the flow of activities while creating room for reflection, collaboration, and creativity.

3.6 Results of observation of social studies learning

Classroom observations show:

- The media used is still predominantly conventional (books, whiteboards, LKS), not yet multimedia.
- Mindful activities are not yet strong; students are not given time to relate learning experiences to real life.
- The delivery of material is less contextual (*weak meaningful aspects in implementation*).
- The *joyful element* is not yet visible; students show boredom and lack of enthusiasm.

- Collaboration is rarely facilitated; Learning is more individual.
- Creativity has not been explored because of the dominance of memorization and problems.
- Teachers do not understand the principles of MMJ comprehensively, so they need training and support.

Table 5.
Summary of observations and development implications

Aspects observed	Observational findings	Implications for the development of ICT-based MMJ
Learning media	Conventional; minimal multimedia	Develop ICT-based interactive multimedia
Mindful learning	Lack of reflection/attention	Add reflective pauses, observation guides, short journals
Meaningful learning	The material is not related to the local reality	Tuban environment-based contextual digital content
Joyful learning	Students are bored, lack of enthusiasm	Gamification, visually appealing, exploratory activities
Collaboration	Groups are rare, tend to be individuals	Group projects, media-assisted collaborative challenges
Creativity	Dominant activity memorization/questions	Open-ended tasks, creative products, <i>digital artifacts</i>
Teacher readiness	Not yet fully understanding MMJ	Practice-based training and ready-to-use teaching tools

Source: Observation of IPAS learning (July 2025).

3.8 Synthesis of findings

Taken together, the four strands of evidence converge on a coherent picture. First, school ICT facilities are largely adequate, removing infrastructure as the principal constraint. Second, teachers are willing and broadly competent with technology but lack ready-to-use models for integrating the MMJ dimensions, especially the mindful aspect, into IPAS learning. Third, students consistently demand visual, interactive, and experiential learning and reject text-only instruction. Fourth, classroom observation confirms that practice remains largely conventional despite this readiness and demand. The decisive issue that emerges across all sources is therefore not access or motivation but the absence of a learning-management design that translates available technology and goodwill into MMJ-integrated practice. This synthesised need provides the empirical basis for the development framework discussed in the following section.

4. DISCUSSION

The discussion below moves from describing the findings to interpreting their meaning and implications. Rather than restating the percentages, it asks what the data reveal about the readiness–practice gap and why that gap persists. The central argument is that the obstacle to MMJ-integrated, ICT-based IPAS learning lies primarily in a shortfall of learning management, the design, sequencing, and orchestration of learning, rather than in a lack of devices or teacher motivation. Each of the following points therefore links a specific empirical finding to its interpretation and to the corresponding development need.

4.1 Limited availability of ICT facilities

Based on data collection, ICT facilities are relatively available (LCD/projector 89.58%; internet 85.42%; laptop/computer 83.33%), but the ability of teachers to integrate ICT in learning is still less (58.63%) than the availability and interest of teachers. This pattern is commonly reported in the technology integration literature: key issues often shift from "availability" to "pedagogical capabilities and learning design". A systematic review and meta-analysis of TPACK-based interventions (*Technological Pedagogical Content Knowledge*) emphasizes that many teacher technology competency development programs do not

sufficiently link technological knowledge with pedagogic knowledge and content, resulting in inadequate classroom integration (Fabian et al., 2024). In the context of this study, the fact that 91.67% of teachers have participated in ICT training but only a fraction of them can integrate ICT directly, confirms the need for classroom practice-based training (*Classroom-Embedded Coaching*), so that training is not only procedural. Training needs to direct teachers to pedagogical decision-making such as when to use video, how to manage discussions after videos, how to organize device-based group work, and how to evaluate collaboration and creativity processes.

4.2 Interactive multimedia as an answer to student preferences

The students' very strong preference for images/videos and interactivity, and almost all students express boredom if they only read books, show that there is an important need for an interesting IPAS learning design for students. IPAS learning design needs to shift the experience from passive textual to visual-interactive-experiential. However, the use of multimedia needs to follow the principles of instructional design so that it does not just become "entertainment" that reduces the depth of learning. Research on the effectiveness of instructional videos recommends strategies such as segmentation (dividing videos into short sections), signaling (highlighting important information), and avoiding irrelevant elements to lower cognitive load.

When these principles are combined with MMJ Learning, videos and visual media can not only attract students' attention (joyful), but also become an entrance for meaningful learning (contextual) and mindful learning (reflection). For example, a video of a local IPAS phenomenon can be followed by a reflective *pause* activity: students are asked to observe, record, and relate to experiences in the home/school environment. Thus, media is not only a tool for presentation, but a tool for learning management.

4.3 The *mindful aspect* becomes a weak point

The findings of this study show that 95.83% of teachers stated that teaching tools have not accommodated the *mindful aspect*. More deeply, this shows that reflection and mindfulness have not yet become a standard part of the IPAS scenario in the classroom. According to the literature, mindfulness in schools is often operationalized through attention exercises, breath awareness, *body scans*, and reflective practices that support the regulation of emotions and attention. Systematic reviews show high-quality evidence that mindfulness interventions in schools have the potential to improve attention, lower attention/ADHD problems, and improve executive function and prosocial behavior (Phan et al., 2022). In the context of children with special needs such as ADHD, mindfulness-based exercises are also believed to provide improved attention and emotional regulation (Elzohairy et al., 2024).

In IPAS learning, the concept of mindful is understood as the arrangement of attention and reflection that is deliberately designed in the learning process. Its application can be done through a few simple strategies, such as providing a mindful pause for about 2-3 minutes before the exploration activity to help students manage focus and readiness to learn. In addition, teachers can use reflective questions after observation activities, for example by asking what students see, what changes from the object being observed, and how they feel during the process. Reflection activities can also be strengthened through the use of mini journals or exit tickets that encourage students to conclude learning outcomes while relating them to experiences or realities they encounter in daily life. Therefore, the needs of teachers in social studies learning are not only limited to the provision of digital media, but also to learning management that is able to provide reflective scripts and clear time management, so that the mindful learning process can take place consistently in teaching and learning activities.

4.4 Meaningful learning and local context

The results of observations show that the delivery of IPAS material is still often carried out directly without linking it to the local context that is close to the lives of students. In fact, meaningful learning requires a connection between the concepts learned and the personal experience and the socio-cultural environment of the students. In this case, the integration of information and communication technology (ICT) can open up opportunities to bring local context into learning, for example through the use of photos or videos of the surrounding

environment, simple maps of students' residential areas, or real problems that occur in their communities. The literature on the use of ICT in education also confirms that technology will be more effective if it is able to facilitate a richer representation of knowledge and provide access to learning resources that are relevant to students' lives (Haleem et al., 2022).

Through the use of multimedia, IPAS material can be contextualized with various phenomena that are close to students' lives, such as coastal ecosystems, local economic activities, human interaction with the environment, and hygiene and health issues around the school. However, it should be emphasized that this study does not present specific examples of local content because the data used are limited to the documents analyzed. Therefore, the resulting recommendations are more focused on the learning design level, namely that learning content needs to contain the context of students' daily lives while facilitating the connection between the concepts learned and their real experiences.

4.5 Joyful learning as a strategy to increase engagement

The results of the study show that both teachers and students convey the need for a pleasant learning atmosphere in the learning process. However, the concept of joyful learning cannot be confused with a play activity that does not have a clear learning objective. In the perspective of active or playful learning, the elements of play and fun are actually effective when they are designed to encourage exploration, discussion, question and answer, and knowledge construction activities by students (Blinkoff et al., 2023).

In the context of IPAS learning, the application of joyful learning can be realized through various learning activities, such as group-based interactive quizzes, simple experiment challenges, concept classification mini-games, and project-based activities with mission or challenge formats. However, the element of fun in learning still needs to be linked to the achievement of learning indicators, especially those related to the development of collaboration and creativity skills. This is in line with research findings that show that 85.42% of teachers explicitly want learning media that is able to facilitate the development of students' collaborative and creative skills. Thus, joyful learning not only serves as a means of creating a pleasant learning atmosphere, but also as a driver of active student participation that contributes to the achievement of social and cognitive learning outcomes.

4.6 Collaboration and creativity

The results of observations show that collaborative activities in learning are still rarely facilitated in a structured manner, so the learning process tends to take place individually. This condition shows that the existence of students in a group does not automatically result in collaboration or creativity. As explained by Putri et al. (2026), collaboration and creativity skills require the design of clear activities, including role divisions, tasks that encourage the negotiation of ideas between group members, as well as the support of learning tools such as assessment rubrics, worksheets, or simple platforms that help teachers manage the groupwork process.

The literature on technology-based creativity also shows that activities such as digital storytelling can encourage the emergence of creativity while developing teamwork skills. In these activities, students need to develop storylines, discuss and agree on common ideas, and produce a joint product as the final result of learning (Chirkova et al., 2022; Torre & Désiron, 2024). In the context of elementary schools, this approach can be adapted in the form of simpler products, such as making digital posters, short videos of experimental results, and multimedia presentations that present the results of student observations (Nasir et al., 2024).

Because the focus of this research is on the learning management aspect, the recommendations produced are not directed at the selection of a specific application or software. On the contrary, the recommendations emphasize more on providing a structured flow of collaborative learning activities, for example through the stages of mindful opening, meaningful exploration, and joyful production. In addition, it is necessary to include process evaluation tools that are integrated in the use of multimedia, such as the collaboration rubric and the creativity rubric, so that teachers can facilitate and monitor the development of students' social and creative skills more systematically.

4.7 Conceptual model of development: integration of MMJ–ICT in IPAS learning management

Based on the findings (teacher readiness, student preferences, vacancy of MMJ teaching tools, and ICT integration gap), development needs can be modeled in three components:

1. Resources (ICT tools and teacher competencies),
2. Learning design (MMJ and multimedia), and
3. Competency results (collaboration and creativity).

The three components above are presented again in the conceptual model as follows:

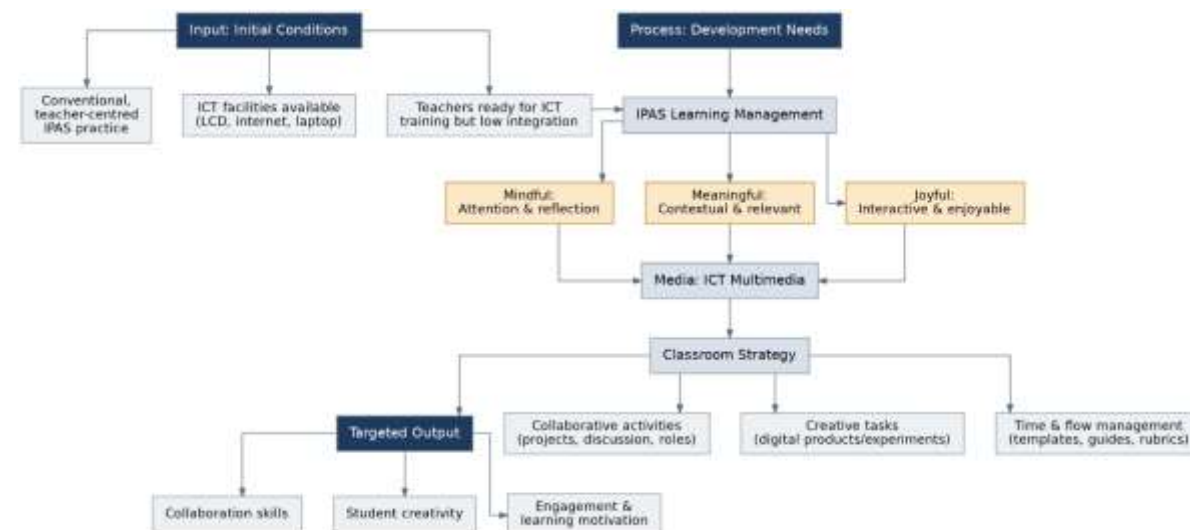


Figure 6. Conceptual Diagram Drawing

This model is a map of development needs derived from research findings.

4.8 Recommendations for the development of science learning management based on MMJ Learning and ICT multimedia

Based on the overall findings of the research, development recommendations are directed at three main areas, namely the development of digital teaching tools, the strengthening of learning management that includes the flow of activities and time management, and the strengthening of teacher capacity. These three aspects are seen as complementary in supporting the implementation of more effective and meaningful social studies learning.

In the field of digital teaching devices, development is directed at the use of interactive multimedia that is modular. The material is arranged in short, flexible modules so that they can be selected and adapted to the needs of the class, in line with the finding that most teachers want flexibility in the use of learning media. In addition, multimedia content needs to emphasize the dominance of visual elements such as videos, images, and short animations designed with the principles of effective learning design, including material segmentation, information emphasis signaling, and concise presentation. Interactivity in multimedia also needs to be designed in a targeted way through quizzes, simple simulations, and challenges that encourage student reasoning, so that activities are not just mechanical interactions such as pressing buttons or choosing answers. In addition, multimedia devices can also contain elements of mindful learning, for example through reflective pauses, guide questions, mini-journals, or digital exit tickets that help students build awareness and meaning of the learning process.

In the field of learning management, reinforcement is directed at providing clear activity flows and effective time management support. Each learning meeting can use a flow template based on the MMJ approach, namely mindful opening, meaningful exploration, and joyful consolidation. This structure helps teachers organize learning stages systematically while ensuring that there is room for reflection, exploration of concepts, and strengthening understanding through fun activities. In addition, practical time management guidance is needed for teachers, given that learning time management is often a challenge in classroom practice (Evaldsson & Melander, 2017). At the implementation stage, collaborative activities also need to be explicitly designed through role sharing, discussion rules, group decision-

making mechanisms, and the use of collaboration rubrics to assess students' cooperation processes (Zhu & Ergulec, 2023). Learning can also be complemented by product-based creative tasks, such as simple digital storytelling or group presentations, which encourage the development of students' creativity and teamwork skills (Chen et al., 2023).

Meanwhile, in the field of teacher capacity building, development efforts are focused on improving pedagogical and technological competencies in an integrated manner. Teacher training can be designed based on the TPACK framework that integrates aspects of technology, pedagogy, and science content, and is complemented by learning design practices and microteaching activities as a means of implementation training (Fabian et al., 2024). In addition to training, implementation assistance is also needed in the classroom, where teachers are given the opportunity to try the use of multimedia modules in learning, then reflect together to improve the learning scenarios that have been implemented (Sau glam Arslan & Sahinou glu, 2023; Budianto & Hairit, 2024). This effort can also be strengthened through the development of a cross-school good practice bank that allows teachers to share experiences and effective learning strategies, thereby reducing the practice gap between schools while accelerating the adoption of successful learning innovations (Fuller, 2020).

4.9 Theoretical and practical implications

Theoretically, these findings connect two literatures that have largely developed separately: research on ICT integration in teaching and research on mindful, meaningful, and joyful learning. The persistent weakness in the mindful dimension, despite adequate facilities and positive teacher attitudes, indicates a conceptual gap in how reflective practice is operationalised within technology-supported elementary learning. By framing the three dimensions as a single, manageable design problem rather than as isolated constructs, this study extends needs-analysis research toward an integrated model of MMJ learning management and clarifies why infrastructure-centred accounts of ICT integration are insufficient on their own.

Practically, each recommendation can be tied directly to a specific finding. Because teachers can operate devices but struggle to design MMJ lessons, the priority investment is in learning-management tools, ready models, activity flows, and guidance, rather than in additional hardware. Because the mindful dimension is the weakest, multimedia should embed explicit reflective stops and prompts. Because students prefer visual, interactive, and experiential activities, the materials should foreground video, simulation, and game-like tasks. And because teachers report time-management and collaboration difficulties, the design should provide built-in pacing guides and collaboration scaffolds. In this way, the practical implications follow from the evidence rather than from general pedagogical ideals.

5. CONCLUSION

This study set out to identify and analyse the needs for developing MMJ-integrated, ICT-multimedia-based IPAS learning management in elementary schools in Tuban Regency. Synthesising questionnaire, interview, observation, and documentation evidence, it concludes that the core need is not the provision of devices but the management of learning. Although facilities are largely adequate and teachers are willing, a readiness–practice gap persists because there is no instructional design that integrates the mindful, meaningful, and joyful dimensions into everyday IPAS teaching. The study's contribution and novelty lie in reframing the problem from device provision to learning management and in proposing an empirically grounded, three-component development framework, resources, an MMJ-multimedia learning design, and collaboration–creativity outcomes, that addresses the three MMJ dimensions simultaneously rather than separately.

On this basis, the study offers recommendations that follow directly from its findings. Development should focus on modular ICT multimedia whose activity flow makes the MMJ sequence explicit: reflective (*mindful*) stops and prompts to address the dimension identified as weakest, contextual (*meaningful*) representations of natural and social phenomena to match students' visual and experiential preferences, and enjoyable (*joyful*) interactive tasks to sustain engagement. To close the readiness–practice gap, this multimedia should be accompanied by

structured time-management guidance, collaboration scaffolds, and classroom coaching that builds teachers' pedagogical, not merely operational, capacity to integrate technology.

These conclusions should be read in light of the study's limitations. The needs analysis was conducted in six schools with 12 teachers and 60 students, and the data are predominantly descriptive, so the findings are intended to inform design rather than to support broad generalisation. Future research should develop the proposed MMJ-multimedia learning-management package and test its effectiveness through design-based and experimental studies across a wider and more varied sample, thereby validating the framework and examining its impact on teachers' integration practice and on students' engagement and learning outcomes.

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