



Innovative Learning: SMAW Welding via YouTube Channel for Vocational Colleges

Mohd Erfy Ismail^{1*}, Muhammad Saiful Amin¹, Suhaizal Hashim¹, Khairul Anuar Abdul Rahman¹, Mohd Hasril Amiruddin¹

¹ Faculty of Technical and Vocational Education
Universiti Tun Hussein Onn Malaysia, Batu Pahat, 86400, Malaysia

*Corresponding Author: erfy@uthm.edu.my
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Abstract

The integration of YouTube channel in vocational education has gained significant attention for its potential to enhance student engagement through interactive and visually rich learning experiences. However, preliminary findings indicate that students enrolled in the Welding Technology course face difficulties in comprehending welding processes during traditional classroom instruction. This study aims to develop a YouTube-based learning channel for the Shielded Metal Arc Welding (SMAW) subject, grounded in established learning theories and aligned with the Vocational College syllabus. Additionally, the study investigates the effectiveness of YouTube in enhancing students' knowledge, intrinsic motivation, and attitudes toward learning SMAW welding, while also addressing the limited availability of teaching aids (ABBM) for this subject. The research adopted a product development approach using the ADDIE model and employed a quantitative methodology. Data were collected using a structured questionnaire. A pilot study was conducted with 30 first-year students at Muar Vocational College to test the instrument, yielding a Cronbach's Alpha reliability score of 0.865, indicating good internal consistency. The actual study involved 40 first-year students at Batu Pahat Vocational College, selected through purposive and independent random sampling methods. Data were analyzed using descriptive statistics via SPSS version 29.0. Findings revealed that students perceived a positive impact on their knowledge perception, intrinsic motivation, and learning attitudes when using the YouTube learning channel. Students who learned through YouTube channel reported increased engagement and understanding of the SMAW welding topic, suggesting that digital platforms like YouTube channel can make vocational learning more effective and engaging. Overall, the use of YouTube channel as a digital learning tool represents a promising alternative for improving teaching and learning outcomes in vocational education settings.

1.0 Introduction

Malaysia as a developing country, places high importance on strengthening its education system to support national progress and socio-economic growth. Central to this vision is the Malaysian Higher Education Development Plan (PPPM-PT) 2015–2025, which aims to enhance access, quality, equity, and unity in education. One of the strategic pillars of this plan is Technical and Vocational Education and Training (TVET), designed to provide students with industry-relevant skills and practical experience. The establishment of Vocational Colleges under the Ministry of Education (KPM) reflects the nation's commitment to offering vocational diploma programs, especially to students who may not excel in traditional academic pathways (Jamaludin et al., 2023; Ridzuan et al., 2022). These institutions serve as a bridge to address national workforce needs and ensure the employability of graduates through industrial training and certification.

In building an effective education system, knowledge acquisition remains fundamental. Education not only transfers information but transforms it into lifelong competencies and skills necessary for economic development. In the current digital landscape, knowledge dissemination is no longer confined to classrooms or textbooks. Digital learning tools—particularly e-learning platforms and multimedia resources such as YouTube—have emerged as vital supplements to traditional teaching methods. These tools offer interactive content, flexible access, and multimodal learning experiences that cater to various student needs and learning paces (Megan et al., 2023; Rohit et al., 2021). YouTube, for instance, empowers students to revisit complex topics, watch procedural demonstrations, and learn at their convenience—supporting better comprehension and retention of vocational skills (Srinivasacharlu et al., 2020).

Intrinsic motivation, or the internal drive to engage in learning for personal satisfaction and interest, is another essential factor in student success. This type of motivation is especially crucial in technical education, where students must often navigate challenging concepts and hands-on skills. Research by Lifeas (2022) highlights that intrinsically motivated students are more likely to persist in learning, embrace difficult tasks, and attain academic success. Moreover, platforms like YouTube, which present content in visual and engaging formats, can enhance students' enthusiasm and sense of achievement. As students take ownership of their learning through self-directed video consumption, they become more proactive, independent, and confident in their skill development (Neome et al., 2023).

The attitude of students towards learning, especially towards technology, significantly influences educational outcomes. A positive attitude enhances digital literacy, encourages exploration, and reduces resistance to new learning methods. In vocational settings, where practical applications are central, a student's openness to digital tools can accelerate their mastery of skills and concepts. Understanding these attitudes helps educators design more inclusive and adaptive teaching strategies that blend traditional instruction with modern platforms like YouTube. Studies by Ferrero et al. (2023) and Dhani et al. (2022) suggest that students with favorable views of e-learning tend to be more engaged, disciplined, and responsive to feedback—qualities that are essential in technical and skill-based education.

Overall, Malaysia's integration of TVET with digital technology aligns with global trends in modernizing vocational education. As challenges in knowledge comprehension, motivation, and student attitude persist, it is clear that technology-driven learning tools are no longer optional but necessary to close these gaps. Platforms such as YouTube provide accessible, affordable, and scalable solutions for vocational learners, supporting not just academic achievement but also skill readiness and personal development. Through thoughtful integration of these tools, vocational institutions can better fulfill their mission of producing competent, motivated, and industry-ready graduates.

2.0 Problem Statement

In the context of vocational education, particularly in Welding Technology, the traditional teacher-centered approach has proven increasingly inadequate in meeting the evolving learning needs of students. The conventional method, heavily reliant on oral instruction, textbooks, and manual demonstration, often fails to convey the complexity of welding processes and safety practices effectively. Among Malaysian Skills Certificate (SKM) students in vocational colleges, this has resulted in significant gaps in understanding core concepts such as the Occupational Safety and Health Act (OSHA), as well as the fundamental principles of physics and chemistry that underpin welding operations (Nurul Istiqamah et al., 2023; Khadijah et al., 2024). Without a firm grasp of these foundational concepts, students struggle to apply practical skills in real-world scenarios, leading to low performance, safety violations, and reduced job readiness.

At the global level, research supports the integration of digital learning tools such as YouTube to overcome these challenges. In technical and vocational institutions in countries like Germany, Indonesia, and the United States, YouTube has been shown to effectively facilitate knowledge acquisition by offering visual and auditory

representations of theoretical content (Ferrero et al., 2023; Rohit et al., 2021). For instance, welding students in Germany benefit from industry-aligned video tutorials that demonstrate welding procedures and safety compliance, improving both theoretical comprehension and skill retention. The pause-and-replay functionality of YouTube allows students to learn at their own pace, an advantage over live classroom demonstrations that are often too fast for beginners to fully grasp. As a result, YouTube becomes an essential supplementary tool that reinforces classroom instruction and extends learning beyond formal settings.

Beyond improving cognitive learning, YouTube also plays a significant role in enhancing students' intrinsic motivation. Studies from Turkey and South Africa show that when students perceive learning content as engaging, relevant, and interactive, their internal drive to learn increases significantly (Kapofu, 2022; Serife & Eda, 2023). This is particularly evident in vocational education where students often struggle to connect theory with practical application. YouTube bridges this gap by presenting real-world welding applications and industry trends, thus making the content more meaningful and appealing. In Malaysia, research by Hendar et al. (2022) indicates that students exposed to YouTube-based lessons show greater persistence and enthusiasm in mastering practical tasks. The freedom to access learning materials anytime also fosters autonomy and responsibility in managing their learning journey.

Equally important is the impact of YouTube on shaping positive student attitudes. The platform supports learner-centered strategies that encourage active participation, curiosity, and self-reflection. When used strategically, YouTube content can reduce students' dependence on instructors and promote independent exploration, a key trait needed in vocational careers. Research from the UK and Philippines notes improvements in students' discipline, initiative, and workshop preparedness when YouTube is integrated as a core learning tool (Julsar et al., 2023; Bayu, 2020). These behavioral changes indicate that students not only absorb content better but also develop a more professional and proactive approach toward their vocational training. Such transformation is critical in producing industry-ready graduates who are not only skilled but also self-motivated and confident in their field.

In conclusion, the use of YouTube in vocational education—particularly in Welding Technology—provides a multifaceted advantage. It not only strengthens students' knowledge acquisition by simplifying complex theories but also enhances their motivation and fosters more constructive attitudes toward learning. Traditional methods alone are insufficient for today's learners, especially in highly technical disciplines. Integrating YouTube as a technology-based ABBM (Alat Bantu Bahan Mengajar) allows for flexible, engaging, and impactful learning experiences that align with both academic and industry requirements. As vocational institutions aim to prepare students for Industry 4.0, the adoption of digital platforms like YouTube is no longer optional but essential for educational relevance and student success.

3.0 Research Questions

There are two research questions in the study conducted. The research question for this study covers the following aspects:

- i. How is the development process of a YouTube-based learning channel for teaching Shielded Metal Arc Welding (SMAW) to Welding Technology students at Batu Pahat Vocational College?
- ii. To what extent does the YouTube learning channel enhance students' knowledge, intrinsic motivation, and attitudes toward learning Shielded Metal Arc Welding (SMAW) among Welding Technology students at Batu Pahat Vocational College?

4.0 Research Methodology

Product development research that adopts a quantitative approach has become a widely used methodology in educational research globally, especially in the development of instructional tools such as digital learning platforms. This method emphasizes the systematic collection and analysis of numerical data to measure the effectiveness, usability, and impact of the developed product on learners. In this study, the ADDIE model comprising five structured phases: analysis, design, development, implementation, and evaluation was selected as the instructional design framework to guide the development of a YouTube-based learning channel. The choice of a quantitative design aligns with global best practices, where structured instruments like Likert scale questionnaires are commonly employed to evaluate educational innovations with measurable outcomes.

Globally, researchers have found that quantitative methods are particularly effective in product development research due to their ability to produce empirical evidence that supports decision-making and product refinement. For instance, past studies have demonstrated the use of statistical analyses, such as descriptive, to evaluate the impact of e-learning tools on student engagement, knowledge acquisition, and

motivation (Lee & Park, 2018; Smith et al., 2020). In addition, expert validation of instruments and content, as practiced in this study, ensures the reliability and validity of the findings. This is further reinforced by the use of survey structured feedback to gauge students' learning progress and experiences with the product.

Furthermore, the integration of expert reviews and student feedback enhances the development process, enabling continuous improvement of the product throughout each phase of the ADDIE model. In this research, the combination of expert input from technical education professionals and multimedia specialists, along with student perceptions measured using a five-level Likert scale, reflects a rigorous quantitative approach consistent with international standards (Creswell, 2014; Almalki, 2016). This methodological structure allows researchers to identify specific strengths and weaknesses of the YouTube learning channel and make data-driven enhancements. As a result, the research contributes not only to local educational innovation but also aligns with global practices in vocational education research focused on improving teaching and learning through technology. Below is Figure 4.1, which illustrates the stages of the ADDIE model.

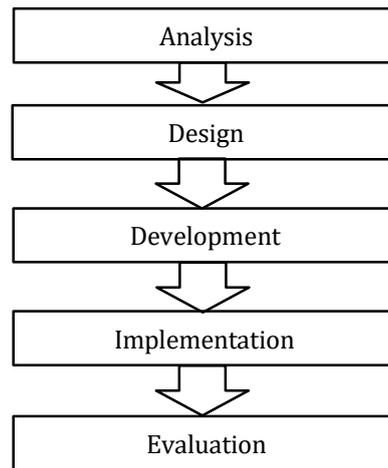


Fig. 4.1 Stages in the development of the ADDIE Model

4.1 Analysis Phase

The researcher adopted the ADDIE model as the foundational framework for designing and developing the learning channel. The first stage in this model is the Analysis Phase, which plays a crucial role in identifying the core problems faced in the learning process and determining appropriate strategies to address them. This phase ensures that the learning solution developed aligns with students' needs, the curriculum requirements, and the instructional objectives for the Shielded Metal Arc Welding (SMAW) subject. Several key analyses were conducted to provide a comprehensive understanding of the learning context:

i. Input Analysis

This analysis focuses on evaluating the existing learning materials, resources, and infrastructure available for teaching the SMAW module. The researcher found that traditional teaching methods relied heavily on textbooks and in-person demonstrations, which often failed to engage students or provide sufficient understanding of theoretical concepts. There was also a lack of modern ABBM (Alat Bantu Bahan Mengajar) such as multimedia or interactive resources, which prompted the need for a technology-integrated learning platform like a YouTube Channel.

ii. Process Analysis

The process analysis examined the current teaching and learning practices in vocational colleges, particularly how welding content is delivered. Observations and informal feedback from instructors revealed a gap in students' comprehension during lectures, especially on safety standards and technical theory. The use of static teaching tools was found to be ineffective in catering to different learning styles, especially for visual and auditory learners. This analysis highlighted the need for more engaging, flexible, and accessible instructional media.

iii. Analysis of Target Users

This analysis involved profiling the intended users of the learning channel for students enrolled in the Welding Technology program. Through surveys and discussions with instructors, the researcher identified that students often had limited background knowledge in science and technology, low intrinsic motivation, and faced difficulties understanding abstract welding concepts. Furthermore, their attitudes toward traditional learning were passive,

showing a preference for dynamic and visual learning formats. These findings justified the choice of YouTube as a platform, offering content in a form that suits the preferences and digital habits of today's learners.

In summary, the analysis phase provided a strong foundation for designing an effective digital learning solution. By thoroughly understanding the instructional gaps, technological limitations, and student needs, the researcher was able to set clear objectives for developing a YouTube-based SMAW learning channel that is relevant, engaging, and capable of improving knowledge, motivation, and student attitudes.

4.2 Design Phase

The design phase represents the second stage in the ADDIE model of product development, where the conceptualization and planning of the learning product take place. In this phase, the overall appearance, structure, theoretical framework, and technological components of the product are carefully outlined to ensure effective and engaging learning experiences.

For this study, the product is a YouTube learning channel dedicated to teaching Shielded Metal Arc Welding (SMAW) for Vocational College students. The channel's interface is designed to resemble typical YouTube pages to maintain user familiarity and ease of navigation. This includes standard YouTube layout elements such as video thumbnails, playlists, channel sections, and comment areas to foster user interaction and engagement. However, the key differentiation lies in the editor technology and instructional materials used to produce the video content. Unlike standard YouTube pages that often rely on basic video uploads, this channel integrates advanced video editing software and multimedia tools to enhance the instructional quality. These materials are developed using a theoretical learning approach, grounded in instructional design principles and relevant vocational education pedagogy. This approach ensures that content is not only visually appealing but also pedagogically sound, promoting knowledge acquisition, motivation, and positive student attitudes.

The design also incorporates multimedia elements such as animations, voiceovers, step-by-step demonstrations, and interactive visual aids to clarify complex welding processes and safety procedures. This aligns with the dual coding theory and cognitive load theory, which emphasize the use of both verbal and visual information to improve understanding and retention. In summary, the design phase establishes a structured, familiar, and theoretically-informed YouTube learning channel, distinguished by its sophisticated use of editing technology and tailored instructional materials. This careful design aims to maximize learning effectiveness and student engagement in the technical subject of SMAW welding.

4.3 Development Phase

The development phase is the third stage in the ADDIE model, focusing on the actual creation and assembly of the learning materials and platform. In this study, the development of the learning channel utilizes a combination of digital tools such as Canva, CapCut, and YouTube channel to produce and deliver engaging educational content on Shielded Metal Arc Welding (SMAW).

Canva is employed to design the theoretical learning content. This platform allows the creation of visually appealing instructional materials by integrating images, text, colors, and audio. Canva's user-friendly interface enables the production of clear, concise, and well-organized visual aids that support students' understanding of welding concepts and safety procedures. For practical welding demonstrations, **CapCut**, a desktop-based video editing software, is utilized to enhance raw video footage. CapCut facilitates the integration of multiple multimedia elements such as text annotations, instructional images, background music, and transitions. These edits ensure that the welding processes are presented in a clear, step-by-step manner that is both informative and engaging for students.

Once the content is finalized, the edited videos are exported as high-quality clips ready for online dissemination. The videos are then uploaded to **YouTube**, which serves as the primary learning platform. Through **YouTube Studio**, the researchers manage the channel by organizing video playlists, scheduling content releases, and enabling live streaming sessions. This platform provides an accessible and flexible way for students to engage with the learning materials anytime and anywhere. Overall, this development phase combines creative design, advanced editing, and a widely accessible digital platform to create a comprehensive learning channel that supports both theoretical and practical learning objectives for vocational welding students.

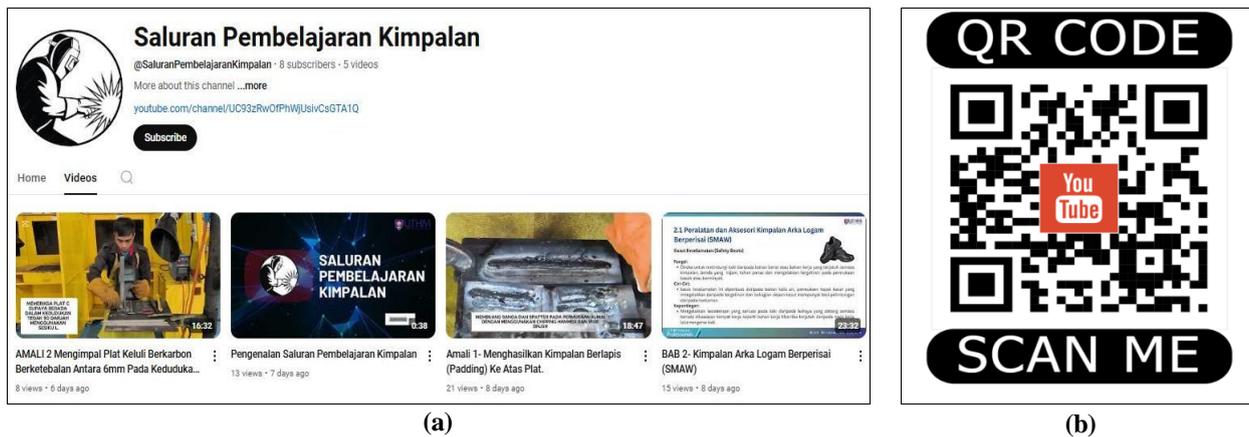


Fig. 4.2 (a) YouTube Learning Channel (b) QR Code for Learning Channel

4.4 Implementation Phase

The implementation phase is the fourth stage in the ADDIE model, where the developed learning channel product is introduced and used in a real learning environment according to the needs identified during the analysis phase. This phase involves deploying the YouTube learning channel to a selected group of Welding Technology students and teaching staff who meet the predetermined criteria. During this phase, the target students actively engage with the learning materials on the channel, applying the theoretical knowledge and practical demonstrations to their studies. Teaching staff monitor and support the students' use of the channel, facilitating integration with existing classroom and workshop activities.

Observations and feedback are systematically collected throughout the implementation to identify any issues or areas for improvement. This iterative process allows for adjustments and refinements to be made to the learning channel before it is officially launched for broader use. The aim is to ensure the product is both effective and user-friendly, maximizing its potential impact on student learning outcomes.



Fig. 4.3 (a) & (b) The use of YouTube learning channel by target users

4.5 Evaluation Phase

The evaluation phase is the final and a critical stage in the ADDIE model, aimed at ensuring the quality, effectiveness, and relevance of the developed learning channel. Importantly, evaluation is an ongoing process integrated throughout every phase of the ADDIE model to support continuous improvement and refinement of the instructional product.

In this study, expert validation played a key role in the evaluation process. Three experts were involved in assessing the research instruments: two specialists from the Faculty of Technical and Vocational Education (FPTV) and one lecturer from Vocational College Batu Pahat. These experts reviewed and validated the questionnaire to confirm its clarity, reliability, and appropriateness for collecting meaningful data from the students. Additionally, the content of the SMAW welding learning channel underwent rigorous evaluation by two experts—one from the multimedia division of FPTV and another from Vocational College Batu Pahat. Their task was to ensure that the channel's instructional materials were accurate, relevant, and aligned with the curriculum and industry standards, thereby enhancing its pedagogical value.

Following expert validation, student surveys were conducted to gather direct feedback on the usability,

functionality, and overall impact of the learning channel. This feedback provided valuable insights into how the channel influenced students' knowledge acquisition, intrinsic motivation, and attitudes toward learning welding technology. The combination of expert review and student input allowed for comprehensive evaluation and informed necessary revisions to optimize the channel before its wider implementation.

4.6 Population and Sampling Study

The population for this study comprised first-year students enrolled in the Welding Technology course at Batu Pahat Vocational College. A purposive sampling technique was employed to select participants, focusing specifically on students taking the Shielded Metal Arc Welding (SMAW) subject. Out of a total of 143 eligible students, a sample of 40 first-year students was selected to participate in the study. This sampling method was chosen to ensure the respondents had direct experience with the content being evaluated, thereby increasing the relevance and reliability of the findings (Creswell & Creswell, 2018).

4.7 Validity and Reliability

Validity is a crucial aspect of research across various disciplines, as it determines the extent to which a tool or questionnaire accurately measures what it is intended to measure (Şerife, 2023). In the context of social science research, reliability is equally important. One widely accepted method for assessing reliability is Cronbach's alpha coefficient, which evaluates the internal consistency of research instruments to ensure stability and accuracy in the findings (Allyson, 2023). Conducting a pilot study is essential for enhancing both the reliability and validity of the data collection process (Jeanne, 2021). In this study, a pilot test was conducted at Muar Vocational College, yielding a Cronbach's alpha value of 0.865. This result indicates that the research instrument demonstrates a high level of reliability and is suitable for use in the main study.

5.0 Findings

The questionnaire used in this study was developed to get the data from respondents to collect information from individuals in a standardized and structured way about a specific topic or subject. This questionnaire also have five parts, which are parts A, B, C, D, and E. Part A consists of demographic information of respondents such as gender, race, age and year of study. Sections B, C and D are students' perception on knowledge, student's intrinsic motivation and student's attitude towards using YouTube Channel for learning shielded metal arc welding (SMAW). Section E is a comment and improvement space for the welding learning channel the items contained in the questionnaire were analysed by evaluating the mean score base on a Likert scale of five degrees that are strongly disagree, disagree agree, moderately agree, agree, and strongly agree. Item analysis is referred to the range of means score in Table 5.1

Table 5.1 The mean range of five points Likert Scale (Creswell & Creswell, 2018)

Min Value Score	Level
1.00 – 1.80	Very Weak
1.80 – 2.60	Weak
2.61 – 3.40	Moderately

3.41 – 4.20	Good
4.21 – 5.00	Very Good

5.1 Part A: Demographics of Respondents

Tables 5.2 to 5.5 present the demographic distribution of 40 respondents. The majority were male (82.5%), while females made up 17.5%. All respondents were Malay (100%). In terms of age, all were 16 years old (100%), with none aged 17. Additionally, all respondents were in Year 1, Semester 1 (100%).

Table 5.2 Frequency distribution of respondents by gender

Gender	Frequency (f)	Percentage (%)
Male	33	82.5
Female	7	17.5
Amount	40	100

Table 5.3 Frequency distribution of respondents by race

Nation	Frequency (f)	Percentage (%)
Malay	40	100
Indian	0	0
Chinese	0	0
Other races	0	0
Amount	40	100

Table 5.4 Frequency distribution of respondents by age

Age	Frequency (f)	Percentage (%)
16 years old	40	100
17 years old	0	0
Amount	40	100

Table 5.5 Frequency distribution of respondents by year and semester of study

Year and Semester of Study	Frequency (f)	Percentage (%)
Year 1 Semester 1	40	100
Year 1 Semester 2	0	0
Amount	40	100

5.2 Part B: Students' Perception on Knowledge Using YouTube Channel for SMAW Welding Learning

Table 5.6 shows the students' knowledge regarding the use of the YouTube Channel for SMAW welding learning. The overall average knowledge of students is at a high level with a mean value of 4.29 and a standard deviation of 0.708. The highest mean value for student knowledge is for item B6, "I can understand the use of electrodes and welding positions in welding practice through the YouTube Channel for SMAW welding." with the lowest standard deviation of 0.599. The lowest mean value is 4.13 for item B1, "I can explain the welding process effectively through the YouTube Channel in the theoretical learning of SMAW welding," with the highest standard deviation of 0.791.

Table 5.6 Students' perception on knowledge using YouTube Channel for learning SMAW welding

No	Item	Mean	Standard Deviation	Level
B1	I can explain the welding process effectively through the YouTube Channel in the theoretical learning of SMAW welding.	4.13	0.791	High
B2	I know the importance of personal safety through the YouTube Channel in the theoretical learning of SMAW welding.	4.48	0.640	High
B3	I can relate the importance of welding in providing career opportunities through the YouTube Channel in the theoretical learning of SMAW welding.	4.20	0.723	High
B4	I can apply the correct welding techniques in welding practice using the YouTube Channel for SMAW welding.	4.25	0.742	High

No	Item	Mean	Standard Deviation	Level
B5	I can understand current control and metal response in welding practice through the YouTube Channel for SMAW welding.	4.20	0.758	High
B6	I can understand the use of electrodes and welding positions in welding practice through the YouTube Channel for SMAW welding.	4.48	0.599	High
Overall Average		4.29	0.708	High

5.3 Part C: Student's Intrinsic Motivation using YouTube Channel for SMAW Welding Learning

Table 5.7 shows the intrinsic motivation of students regarding the use of the YouTube Channel for SMAW welding learning. The overall average intrinsic motivation of students is at a high level with a mean value of 4.33 and a standard deviation of 0.627. The highest mean value for intrinsic motivation is 4.50 for item C4, "I enjoy watching SMAW welding techniques through the YouTube Channel for reference in welding practice." with the lowest standard deviation of 0.549. The lowest mean value is 4.20 for item C1, "I am interested in learning SMAW welding more deeply through the YouTube Channel according to my own desires without anyone's coercion," with the highest standard deviation of 0.700.

Table 5.7 Student's Intrinsic Motivation Using YouTube Channel for SMAW Welding Learning

No	Item	Mean	Standard Deviation	Level
C1	I am interested in learning SMAW welding more deeply through the YouTube Channel according to my own desires without anyone's coercion.	4.20	0.700	High
C2	I enjoy learning difficult welding theory concepts using the YouTube Channel for SMAW welding.	4.23	0.620	High
C3	I am interested in exploring the welding career opportunities needed by the industry through the YouTube Channel for SMAW welding.	4.43	0.599	High
C4	I enjoy watching SMAW welding techniques through the YouTube Channel for reference in welding practice.	4.50	0.549	High
C5	I am confident in my ability to learn SMAW welding with reference materials through the YouTube Channel.	4.35	0.648	High
C6	I enjoy the interactive features in SMAW welding through the YouTube Channel that allows students to share opinions.	4.30	0.648	High
Overall Average		4.33	0.627	High

5.4 Part D: Student's Attitude Towards the Use of YouTube Channel for SMAW Welding Learning

Table 5.8 shows the student's attitudes towards the use of the YouTube Channel for SMAW welding learning. The overall average student attitude is at a high level with a mean value of 4.36 and a standard deviation of 0.573. The highest mean value for student attitude is 4.55 for item D2, "I adhere to personal safety ethics when performing SMAW welding practice to avoid injury risks." with the lowest standard deviation of 0.501. The lowest mean value is 4.13 for item D6, "I create brief notes or mind maps after watching videos obtained or found independently for SMAW welding through the YouTube Channel," with the highest standard deviation of 0.707.

Table 5.8 Student Attitude Towards the Use of YouTube Channel for SMAW Welding Learning

No	Item	Mean	Standard Deviation	Level
D1	I am more disciplined in participating in theoretical and practical SMAW welding sessions to enhance my knowledge.	4.25	0.563	High
D2	I adhere to personal safety ethics when performing SMAW welding practice to avoid injury risks.	4.55	0.501	High
D3	I participate in interactions by asking questions or sharing opinions with the instructor related to the welding learning topic.	4.20	0.608	High

No	Item	Mean	Standard Deviation	Level
D4	I am more diligent in performing SMAW welding practices to hone my talent and meet the requirements for a brighter career.	4.58	0.504	High
D5	I follow the SMAW welding practice processes shown through YouTube to achieve the best results.	4.48	0.554	High
D6	I create brief notes or mind maps after watching videos obtained or found independently for SMAW welding through the YouTube Channel.	4.13	0.707	High
Overall Average		4.36	0.573	High

5.5 Part E: Comments and Improvement Suggestions for YouTube Channel

Table 5.9 shows the comments and suggestions for improvement obtained from student respondents who have used the YouTube Channel as a learning channel for learning welding theory and practice.

Table 5.9: Comments and suggestions

Comments	Suggestion
Learning on YouTube is very helpful for my understanding	Adding interesting content Increase knowledge about welding technology
Using YouTube is easier and can see how to weld properly. Can study outside the classroom. Increasing my interest in learning	
I am satisfied with the topic presented Interesting and clear description	

6.0 Discussion

6.1 Students' Knowledge Perception Through YouTube Channel for SMAW Welding Learning

The study revealed that YouTube significantly enhanced students' understanding of the SMAW welding process, aligning with Ardiansyah's (2020) findings that multimedia tools improve learning outcomes. Koto (2020) further emphasized that well-selected instructional videos substantially increase student knowledge. Additionally, students recognized the importance of personal safety in SMAW welding theory, consistent with Hedaputri et al. (2021), who highlighted that proper safety measures protect learners from workplace hazards. Indrajaya (2021) reinforced this by stressing the necessity of complete personal protective equipment (PPE) in welding workshops. Moreover, students acknowledged welding's career relevance through YouTube content, as Zakaria (2020) noted that self-efficacy influences students to pursue fields aligned with their studies. Mohamed et al. (2021) added that instructors play a crucial role in refining students' skills to meet industry demands.

The study also found that YouTube facilitated the correct application of welding techniques in practice. Aminudin et al. (2022) asserted that both theoretical and practical knowledge of SMAW welding is essential for skill improvement, while Salim et al. (2020) emphasized that welding knowledge ensures both proficiency and safety. Students also better understood current control and metal reactions during welding, supported by Singh's (2022) research on how welding current and electrode selection impact results. Wardani et al. (2020) further noted that excessive current can accelerate material corrosion. YouTube channel also have improved students' comprehension towards electrode usage and welding positions. Ekene (2024) highlighted that proper electrode selection is critical for joint quality, while Nassar (2021) found that electrode type directly affects a workpiece's mechanical properties.

6.2 Students' Intrinsic Motivation Through YouTube Channel for SMAW Welding Learning

The study found that students were genuinely interested in learning Shielded Metal Arc Welding (SMAW) through YouTube without any external pressure. This aligns with Sapbrina (2021), who emphasized that learning interest is strongly linked to an individual's willingness to engage in the learning process. Similarly, Tamara et al. (2022) highlighted that YouTube enhances student engagement and improves learning outcomes, particularly in distance

learning contexts. Students also reported enjoying theoretical welding concepts presented via YouTube, as it made the content more engaging and accessible (Bukit, 2023). Hendar (2022) further supported this by stating that creative instructional videos uploaded to YouTube can significantly boost students' motivation in welding education. In addition, students expressed an interest in exploring careers related to SMAW welding through YouTube. This finding is consistent with Yahya (2023), who asserted that career interest influences students' self-efficacy in making career choices. Hashim et al. (2020) also recommended the expanded use of technology and social media to foster students' interest and support informed career decisions.

Moreover, students appreciated being able to observe welding techniques on YouTube, using the platform as a reference during practical sessions. Mahadi et al. (2022) noted that learners use diverse methods, including visual aids like diagrams and demonstrations, to understand educational content. Ilimiani et al. (2020) similarly found that interactive multimedia tools, such as YouTube videos, enhance students' understanding of teaching materials and increase motivation in hands-on welding practice. This study also revealed that students felt more confident learning SMAW through YouTube reference materials, which aligns with Azhar (2022), who reported that interactive video content can enhance students' self-confidence in applying knowledge practically. From this study, found that students valued the interactive nature of YouTube, particularly the ability to share opinions and engage in discussions. This supports the findings of Marko (2021), who emphasized that YouTube functions as a social media platform that facilitates communication and collaborative learning.

6.3 Students' Attitudes Through YouTube Channel for SMAW Welding Learning

The study found that students demonstrated greater discipline in learning both the theory and practice of Shielded Metal Arc Welding (SMAW) to enhance their knowledge and skills. This aligns with the view of Susanto et al. (2020), who emphasized the importance of character education in developing students who are well-prepared for the demands of the Industrial Revolution 4.0. Discipline is a critical trait nurtured by instructors throughout the learning process (Muhlisin, 2020), and consistent adherence to structured teaching schedules has been shown to encourage students to develop self-discipline (Razman et al., 2022). Students also showed awareness of safety ethics during welding practice, helping to minimize the risk of injury. Shuaib et al. (2021) noted that adherence to safety protocols is essential in vocational education, while Gita et al. (2021) stressed the importance of using personal protective equipment (PPE) when working with welding tools. In support of this, Hamzah et al. (2022) found that YouTube videos can effectively teach students how to properly install and operate welding equipment, thereby raising their safety awareness.

In terms of engagement, students were more active in interacting with instructors by asking questions and sharing their opinions on various learning topics. Pollock (2020) highlighted the importance of such active participation, while Pauziah (2022) noted that social interaction within educational settings can be enhanced through smartphone-based media applications. The use of YouTube as a learning platform not only creates a more interactive and engaging learning environment but also facilitates online communication (Setiyana, 2021). Furthermore, students were found to be more diligent in practicing SMAW welding, motivated by both personal interest and future career aspirations. According to Yuliantin et al. (2021), this diligence helps students develop essential skills for their professional development. Hernandez et al. (2020) also observed that persistence and hard work contribute to building students' sense of responsibility in completing tasks. YouTube tutorial videos further support this process by providing clear, step-by-step guidance, which helps students better understand welding procedures (Yuanta, 2020). Finally, students reported using strategies such as creating short notes or mind maps after watching instructional videos to reinforce their learning and improve academic performance (Karim et al., 2020).

6.4 Conclusion

In conclusion, the use of the SMAW welding learning channel via YouTube among students in the Welding Technology program at Batu Pahat Vocational College has achieved a high level of engagement and acceptance. While feedback from students suggests areas for improvement to enhance the channel's appeal, the analysis indicates that the platform is effective and appropriate for supporting the learning of SMAW welding. Specifically, it contributes to improved knowledge acquisition, intrinsic motivation, and positive learning attitudes. Additionally, instructors can utilize this channel as an alternative and engaging teaching method for welding instruction. Therefore, the integration of this YouTube-based learning channel has the potential to significantly enhance students' academic performance and practical skills in welding.

6.5 Suggestion for future Research

Based on the findings of this study, future research could focus on enhancing the effectiveness of the SMAW welding learning channel on YouTube. Continuous development is necessary to align the content with ongoing technological advancements. Experts have recommended expanding the channel's content to serve as a comprehensive reference for welding students, including the addition of more demonstration videos to support clearer understanding—particularly in mastering high-quality welding techniques. Furthermore, it is suggested that the scope of this study be extended to other vocational colleges to gain a broader perspective on students' acceptance and the overall impact of this learning channel across different educational contexts.

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Conflict of Interest

Authors declare that there is no conflict of interest regarding the publication of the paper.

Author Contribution

The authors confirm full responsibility for the following: study conception and design, data collection, analysis and interpretation of results, and manuscript preparation. All work is carried out independently to ensure integrity and research originality.

References

- Ardiansyah, A. A. and Nana, N. (2020). Peran mobile learning sebagai inovasi dalam meningkatkan hasil belajar siswa pada pembelajaran di sekolah. *Indonesian Journal of Educational Research and Review*, 3(1), 47. <https://doi.org/10.23887/ijerr.v3i1.24245>
- Azhar, C. and Budiyanoro, C. (2022). Pengembangan media pembelajaran berbasis YouTube di pesantren asy-syifa muhammadiyah bantul. *Prosiding Seminar Nasional Program Pengabdian Masyarakat*. <https://doi.org/10.18196/ppm.42.885>
- Aminudin, A., Yuwono, I., Pribadi, W., Aziz, M., Salim, A. T. A., Qory, A., ... & Salsabila, N. J. (2022). Terapan pengelasan dasar smaw masyarakat kayang makmur desa bader kabupaten madiun. *DIKEMAS (Jurnal Pengabdian Kepada Masyarakat)*, 6(2). <https://doi.org/10.32486/dikemas.v6i2.442>
- Allyson L, Spence, Ndeloh F, Christine F. (2023). Reliability and validity in substance misuse and addiction research. [doi: 10.1016/b978-0-323-98814-8.00005-6](https://doi.org/10.1016/b978-0-323-98814-8.00005-6)
- Asnel, R., Suci Destry Ananda, Rahmi Pramulia Fitri, Suryani, & Kursiah Warti Ningsih (2023). Analisis kecelakaan kerja pada pekerja bengkel las. *Health Care: Jurnal Kesehatan*, 12(1), 151-158. <https://doi.org/10.36763/healthcare.v12i1.376>
- Aljufri, A. and Mawardi, I. (2022). Analysis of defects in smaw welding joint using e 7016 electrode due to the direct cooling process. *Journal of Welding Technology*, 4(2), 48-54. <https://doi.org/10.30811/jowt.v4i2.3304>
- Aldin, Sukmawati, Muhammad. (2023). Penggunaan YouTube Dalam Media Pembelajaran. *Jurnal Pendidikan dan Sains*. <https://ejournal.stitpn.acid/index.php/bintang>
- Bayu, Ananto, Wibowo. (2022). Comparative Study of Attitude Assessment Between Senior High School and Vocational High School. *Edukatif*, [Doi: 10.31004/edukatif.v4i2.2133](https://doi.org/10.31004/edukatif.v4i2.2133)
- Bukit, S., Marcela, E. D., & Ernawati, E. (2023). Teacher's strategy to create fun learning in elementary school. *Journal Corner of Education, Linguistics, and Literature*, 2(3), 244-249. <https://doi.org/10.54012/jcell.v2i3.129>
- Creswell, J. W., & Creswell, J. D. (2018). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (5th ed.). SAGE Publications.
- Dhani, Agusni, Zakaria., Silvy, Juditya., Sumbara, Hambali., Sutiswo, Sutiswo., Ruslan, Rusmana. (2022). Traditional Games for Establishing Respect Attitude. *Halaman Olahraga Nusantara*, [doi: 10.31851/hon.v5i2.7966](https://doi.org/10.31851/hon.v5i2.7966)
- Ekene, M. (2024). Effect of welding electrode variation on microstructure and mechanical properties of aisi 204 stainless steel plates joined using shielded metal arc welding. *Engineering Today*, 3(1), 37-45.

<https://doi.org/10.5937/engtoday2400002m>

- Ferrero, María, Álvarez, Sainz. (2023). Attitudes of university students towards traditional face-to-face learning systems and learning with ICT. *E-learning and Digital Media*, doi: [10.1177/20427530231156185](https://doi.org/10.1177/20427530231156185)
- Gita, N. L. P. C., Hadi, M. C., & Yulianti, A. E. (2021). Hubungan tingkat pengetahuan keselamatan dan kesehatan kerja (k3) dengan sikap penggunaan alat pelindung diri pada pekerja dupa. *Jurnal Skala Husada : The Journal of Health*, 18(2), 51-56. <https://doi.org/10.33992/jsh:tjoh.v18i2.1840>
- Hashim, F., Bakar, K. A., & Stapa, S. H. (2020). Analisis appraisal mengenai keterlibatan generasi muda felda dalam industri kelapa sawit. *Malaysian Journal of Social Sciences and Humanities (MJSSH)*, 5(11), 257-271. <https://doi.org/10.47405/mjssh.v5i11.616>
- Hernandez, E. H., Moreno-Murcia, J. A., Cid, L., Monteiro, D., & Rodrigues, F. (2020). Passion or perseverance? The effect of perceived autonomy support and grit on academic performance in college students. *International Journal of Environmental Research and Public Health*, 17(6), 2143. <https://doi.org/10.3390/ijerph17062143>
- Hatini, E. E., & Noordiati, N. (2021). Pemanfaatan Video YouTube tentang Anemia pada Remaja Putri di SMK YPSEI Palangka Raya: Utilization of YouTube Video about Anemia on Adolescent Girls in SMK YPSEI Palangka Raya. *Jurnal Surya Medika (JSM)*, 6(2), 53-60. <https://doi.org/10.33084/jsm.v6i2.2119>
- Hedaputri, D. S., Indradi, R., & Illahika, A. P. (2021). Kajian literatur: hubungan tingkat pengetahuan kesehatan dan keselamatan kerja (k3) dengan kejadian kecelakaan kerja. *CoMPHI Journal: Community Medicine and Public Health of Indonesia Journal*, 1(3), 185-193. <https://doi.org/10.37148/comphijournal.v1i3.27>
- Hendar, & Tanjung, Rahman & Arini, Dede & Syahid, Ahmad & Rudiyanan,. (2022). Pemanfaatan YouTube Sebagai Media Pembelajaran Guna Meningkatkan Motivasi Belajar Siswa. *Jurnal Tahsinia*. 3. 1-10. Doi: [10.57171/jt.v3i1.305](https://doi.org/10.57171/jt.v3i1.305).
- Hamzah, I. and Usmeldi, U. (2022). Dampak media YouTube terhadap hasil belajar siswa pada pembelajaran instalasi penerangan listrik. *Jurnal Pendidikan Teknik Elektro*, 3(2), 192-201. <https://doi.org/10.24036/jpte.v3i2.218>
- Indrajaya, D. and Suhendar, E. (2021). Implementasi migrasi iso 18001:2007 ke iso 45001:2018 pt putrajaya sukses makmur. *Jurnal PkM Pengabdian Kepada Masyarakat*, 4(1), 93. <https://doi.org/10.30998/jurnalpkm.v4i1.9135>
- Ilmiani, A. M., Ahmadi, A., Rahman, N. F., & Rahmah, Y. (2020). Multimedia interaktif untuk mengatasi problematika pembelajaran bahasa arab. *Al-Ta'rib: Jurnal Ilmiah Program Studi Pendidikan Bahasa Arab IAIN Palangka Raya*, 8(1), 17-32. <https://doi.org/10.23971/altarib.v8i1.1902>
- Jeanne, L., Alhusen., Matthew, J., Hayat, Lori, Borg. (2021). A pilot study of a group- based perinatal depression intervention on reducing depressive symptoms and improving maternal-fetal attachment and maternal sensitivity. *Archives of Womens Mental Health*, doi: [10.1007/S00737-020-01032-0](https://doi.org/10.1007/S00737-020-01032-0)
- Julsar T. Calonia, Dickson P. Pagente, Daisy Jane C. Desierto, Rodrigo T. Capio, Jeacelle Ann P. Tembrevilla, Charish A. Guzman, & Ariel Jay S. Nicor. (2023). Time Management and Academic Achievement: Examining the Roles of Prioritization, Procrastination and Socialization. <https://doi.org/10.5281/zenodo.8115965>
- Jamaludin, R. B., Hamid, A. H. A., & Alias, B. S. (2023). Empowering technical and vocational education and training (tvte). *International Journal of Academic Research in Business and Social Sciences*, 13(12). <https://doi.org/10.6007/ijarbss/v13-i12/20159>
- Koto, I. (2020). Teaching and learning science using YouTube videos and discovery learning in primary school. *Mimbar Sekolah Dasar*, 7(1), 106-118. <https://doi.org/10.17509/mimbar-sd.v7i1.22504>
- Karim, R. A. and Mustapha, R. (2020). Students' perception on the use of digital mind maps to stimulate creativity and critical thinking in esl writing course. *Universal Journal of Educational Research*, 8(12A), 7596-7606. <https://doi.org/10.13189/ujer.2020.082545>
- Lifeas, Kapofu, Kapofu. (2022). Praxis nisus: intrinsic motivation and democratic education - convergencies, divergencies and possibilities for science education. *International journal of education and social science research*,

[doi: 10.37500/ijessr.2022.5427](https://doi.org/10.37500/ijessr.2022.5427)

Pollock, F. (2020). State capitalism: its possibilities and limitations. *Critical Theory and Society a Reader*, 95-118. <https://doi.org/10.4324/9781003059509-10>

Pauziah, S. (2022). Pola interaksi siswa pengguna gadget di man 2 kota bogor. *Sosial Horizon: Jurnal Pendidikan Sosial*, 9(1), 35-45. <https://doi.org/10.31571/sosial.v9i1.3636>

Rohit, Peter, Grabusts., Artis, Teilans. (2021). E-learning: developing tomorrow's education. 2:136-140. [doi: 10.17770/ETR2021VOL2.6604](https://doi.org/10.17770/ETR2021VOL2.6604)

Rahayu, M. N. M. and Arianti, R. (2020). Penyesuaian mahasiswa tahun pertama di perguruan tinggi: studi pada mahasiswa fakultas psikologi uksw. *Journal of Psychological Science and Profession*, 4(2), 73. <https://doi.org/10.24198/jpsp.v4i2.26681>

Razman, N. A. M., Tarmizi, N. F. N. M., Zamri, S. A., Fauzi, N. A. A. M., Azhar, A. S. M. K., Fauzi, N. F. B. M., ... & Husin, M. R. (2022). Pengurusan tingkah laku dan disiplin pelajar di sekolah kebangsaan bagan datuk perak. *Journal of Humanities and Social Sciences*, 4(2), 81-88. <https://doi.org/10.36079/lamintang.jhass-0402.390>

Ridzuan, m. R. and Rahman, N. A. S. B. A. (2022). The analysis of the government policy on technical and vocational education and training (tvét) and the predicaments of tvét in malaysia. *International Journal of Humanities Technology and Civilization*, 7(1), 53-58. <https://doi.org/10.15282/ijhtc.v7i1.7611>

Sabirin, F., Sulistiyarini, D., & Zulkarnain, Z. (2020). Pengembangan sistem informasi seminar dan skripsi mahasiswa. *Edumatic: Jurnal Pendidikan Informatika*, 4(1), 73-82. <https://doi.org/10.29408/edumatic.v4i1.2048>

Srinivasacharlu, A. (2020). Using YouTube in colleges of education. *Shanlax International Journal of Education*, 8(2), 21-24. <https://doi.org/10.34293/education.v8i2.1736>

Susanto, E., Putri, N. D., Sanusi, A. R., & Sofyan, F. S. (2020). Pancasila and civic education as reinforcement of the national's character of high school students in karawang regency to face the revolution industry 4.0. *Proceedings of the 2nd Annual Civic Education Conference (ACEC 2019)*. <https://doi.org/10.2991/assehr.k.200320.095>

Salim, A. T. A., Arifin, A. C., Fakhruddin, Y. A., Qathrunnada, M. A., Amrullah, M. N., & Lawu, K. S. (2020). Pelatihan pengelasan bagi santri pondok pesantren tafidzul qur'an "hasan munadi" badegan ponorogo. *Adimas : Jurnal Pengabdian Kepada Masyarakat*, 4(2), 123. <https://doi.org/10.24269/adi.v4i2.1599>

Sapbrina, C. B., Bektiarso, S., & Prastowo, S. H. B. (2021). Pengaruh minat dan motivasi terhadap aktivitas dan kesiapan belajar fisika siswa sman 1 sukomoro. *ORBITA: Jurnal Kajian, Inovasi Dan Aplikasi Pendidikan Fisika*, 7(1), 136. <https://doi.org/10.31764/orbita.v7i1.4405>

Shuaib, N. A., Osman, M., Subri, A. S. M., Nadzri, M. L. M., Bakri, N. I. M., Shahrin, A. S., ... & Firdaus, N. (2021). Assessing risks and control measures on a welding workshop in malaysia. *AIP Conference Proceedings*. <https://doi.org/10.1063/5.0044249>

Setiyana, F. and Badu Kusuma, A. (2021). Potensi pemanfaatan YouTube dalam pembelajaran matematika. *EduMatSains : Jurnal Pendidikan, Matematika Dan Sains*, 6(1), 71-90. <https://doi.org/10.33541/edumatsains.v6i1.2945>

Singh, J. and Singh, G. (2022). Effects of variation in welding current during smaw process on a36 mild steel. *International Journal for Research in Applied Science and Engineering Technology*, 10(8), 259-264. <https://doi.org/10.22214/ijraset.2022.46148>

Serife, Akpınar., Eda, Köksal. (2023). Validity and reliability of food frequency questionnaire used in age-related eye disease studies in Turkish adults. *Journal of Nutritional Science*, [doi: 10.1017/jns.2023.1](https://doi.org/10.1017/jns.2023.1)

Sevgi, S. and Orman, F. (2020). An investigation, based on some variables, into the attitudes of middle school students towards mathematics and metacognitive skills. *İlköğretim Online*, 183-197. <https://doi.org/10.17051/ilkonline.2020.649375>

Khadijah, Siti, Anggi, Febrian., Keysha, Febri, Dhanty., Sri, Hajijah, Purba. (2024). 1. Hubungan Antara Pengetahuan dengan Kejadian Kecelakaan Kerja Pada Pekerja Bengkel Las: Kajian Literatur. *Deleted Journal*, [doi: 10.30605/dj.v1i1.12345](https://doi.org/10.30605/dj.v1i1.12345)

[10.61132/vitamin.v2i3.486](https://doi.org/10.61132/vitamin.v2i3.486)

Tamara, Y. D. and Thohir, M. A. (2022). Analisis efektivitas penggunaan YouTube sebagai media pembelajaran jarak jauh di sekolah dasar. *COLLASE (Creative of Learning Students Elementary Education)*, 5(3), 454-462. <https://doi.org/10.22460/collase.v5i3.10760>

Muhlisin, M. and Nurhidin, E. (2021). Konstruksi kedisiplinan melalui habituasi kegiatan keagamaan. *Indonesian Journal of Islamic Education Studies (IJIES)*, 3(2), 236-251. <https://doi.org/10.33367/ijies.v3i2.1395>

Megan, E., Holtz. (2023). Introduction: Knowledge and Education. doi: [10.1007/978-981-19-9271-1_1](https://doi.org/10.1007/978-981-19-9271-1_1)

Mohamed, H., Puad, M. H. M., Rashid, A. M., & Jamaluddin, R. (2021). Workplace skills and teacher competency from culinary arts students' perspectives. *Pertanika Journal of Social Sciences and Humanities*, 29(1). <https://doi.org/10.47836/pjssh.29.1.06>

Marko, S. A. (2021). Kesantunan berbahasa dalam konten vlog YouTube kontrakan rempong. *Diksatrasia: Jurnal Ilmiah Pendidikan Bahasa Dan Sastra Indonesia*, 5(1), 51. <https://doi.org/10.25157/diksatrasia.v5i1.6485>

Mahadi, F., Husin, M. R., & Hassan, N. M. (2022). Gaya pembelajaran: visual, auditory atau kinestetik. *Journal of Humanities and Social Sciences*, 4(1), 29-36. <https://doi.org/10.36079/lamintang.jhass-0401.341>

Mazni, M. M., Mohd Ahyar, N. A., Jambari, H., Noh@Seth, N. H., & Pairan, M. R. (2023). Persepsi Pelajar Tahun Akhir Bidang TVET Terhadap Penggunaan Media Sosial dalam Pengajaran dan Pembelajaran. *Innovative Teaching and Learning Journal*, 7(1), 28-41. <https://doi.org/10.11113/itlj.v7.98>

Nassar, A. A., Lefta, R. M., & Abdulsada, M. J. (2021). Experimental study of the effect of welding electrode types on tensile properties of low carbon steel aisi1010. *Kufa Journal of Engineering*, 9(4), 163-173. <https://doi.org/10.30572/2018/kje/090411>

Novita, L. and Novianty, A. (2020). Pengaruh penggunaan media pembelajaran audio visual animasi terhadap hasil belajar subtema benda tunggal dan campuran. *JTIEE (Journal of Teaching in Elementary Education)*, 3(1), 46. <https://doi.org/10.30587/jtiee.v3i1.1127>

Noeme A. Rone, Nova Amor A. Guao, Medardo S. Jariol Jr., Nanette B. Acedillo, Kim R. Balinton, Janice O. Francisco (2023). Students' Lack of Interest, Motivation in Learning, and Classroom Participation: How to Motivate Them? *Psych Educ*, 2023, 7: 636-645, Document ID: PEMJ585, doi: [10.5281/zenodo.7749977](https://doi.org/10.5281/zenodo.7749977), ISSN 2822-4353

Nurul Istiqamah, Nurmiah Muin, Umar Mansyur. (2023). Penggunaan Teknologi dan Media Sosial YouTube Terhadap Hasil Belajar Siswa Kelas XI. *Jurnal Program Studi Pendidikan Bahasa dan Sastra Indonesia*. <https://doi.org/10.32682/sastranesia.v11i2.306>.

Wardani, I. P., Setyowati, V. A., Suheni, S., & Samudra, I. P. (2020). The effect of welding current on aisi 1045 strength and corrosion rate. *Journal of Applied Sciences, Management and Engineering Technology*, 1(2), 40-45. <https://doi.org/10.31284/j.jasmet.2020.v1i2.1159>

Yuanta, F. (2020). Pengembangan media video pembelajaran ilmu pengetahuan sosial pada siswa sekolah dasar. *Trapsila: Jurnal Pendidikan Dasar*, 1(02), 91. <https://doi.org/10.30742/tpd.v1i02.816>

Yuliatin, Y., Haslan, M. M., & Sawaludin, S. (2023). Customary law as the basis of character education (study on indigenous peoples in bayan village, north lombok). *Journal of Nonformal Education*, 9(1), 170-178. <https://doi.org/10.15294/jne.v9i1.42720>

Yahya N Azerra & Mohd Izwan Mahmud. (2023). Hubungan antara minat kerjaya dan efikasi sendiri kerjaya dalam pemilihan kerjaya pelajar universiti awam. *Jurnal Dunia Pendidikan*. <https://doi.org/10.55057/jdspd.2022.4.4.8>

Zakaria, N., Rubani, S. N. K., Ariffin, A., Hamzah, N., & Nordin, N. S. (2020). Efikasi sendiri, kemahiran employability dan pemilihan kerjaya dalam kalangan pelajar kolej vokasional. *Online Journal for TVET Practitioners*, 5(2). <https://doi.org/10.30880/ojtp.2020.05.02.009>