Global Synthesis in Education Journal
https://gse-journal.net/index.php/gse
Vol. 01. No. 02. (2024) 28-34
ISSN:3025-5724, DOI: https://doi.org/10.61667/scpfch12

Developing a Social-Media-Based Manufacturing Engineering Drawing Teaching Module to Improve Students' Skills

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Article Info
Received:
Accepted:
Published:

Keywords:
Engineering Education, Instructional Design, Manufacturing drawing, Social media learning, Student Skill, Technology enhances learning.

Abstract

The increasing integration of technology in education has brought forth innovative ways to enhance the learning of complex skills. This study explores the development of a social-media-based teaching module for manufacturing engineering drawing aimed at improving students' technical skills dynamically and engagingly. The research follows a design-based approach, utilizing the ADDIE (Analyze, Design, Develop, Implement, Evaluate) instructional design model to create a modular curriculum delivered through a social media platform (Instagram and YouTube). The study evaluates the effectiveness of this module by conducting a quasi-experimental pre-post test with 120 engineering students from a Vocational High School. Data were analyzed using paired-sample t-tests and qualitative thematic analysis to assess skill improvement and student engagement. Results indicate a statistically significant improvement in students' manufacturing drawing skills, with an average skill gain of 15% ($p < 0.001$). Qualitative findings highlight the positive impact of social media on peer collaboration, real-time feedback, and increased engagement. The module's design was validated through expert reviews, achieving a content validity index (CVI) of 0.88. The findings suggest that social media can provide an effective and scalable platform for teaching technical subjects, facilitating enhanced interaction and knowledge retention. This study contributes to the literature on technology-enhanced learning and offers practical recommendations for educators seeking to incorporate social media into manufacturing engineering curricula.

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Raihan. P.A, Jarudin (2025). Developing a Social Media-Based Manufacturing Engineering Drawing Teaching Module to Improve Students' Skills*: Global Synthesis in Education Journal, 6* (2), 30-41. DOI: https://doi.org/10.61667/scpfch12

INTRODUCTION

The manufacturing sector's rapid evolution and the growing demand for highly skilled workers have prompted engineering education to re-evaluate traditional pedagogical approaches. Specifically, teaching engineering drawing, a foundational skill in manufacturing engineering, requires pedagogical innovation, as conventional teaching methods often do not engage students effectively or adequately prepare them for complex, real-world tasks (Cress et al., 2018). This need for innovation underscores the necessity to integrate digital tools and platforms into the curriculum, fostering technical proficiency, collaborative problem-solving skills, and immediate feedback mechanisms.

Digital tools and social media platforms such as Instagram, YouTube, and specialized online communities have emerged as valuable resources for enhancing formal and informal learning. These platforms facilitate interactive communication, peer-to-peer feedback, and collaborative learning, all essential for developing technical skills. Evidence from studies in educational technology supports the idea that such tools can reduce cognitive load and enhance engagement through distributed learning mechanisms (Kirschner et al., 2018). Additionally, research indicates that social media-based instructional strategies can promote active learning and a sense of community among learners, which is critical in complex tasks like engineering (Saini & Abraham, 2019). The dynamic and accessible nature of these digital environments allows educators to create iterative learning experiences that are responsive to the learners' evolving needs.

However, integrating social media into manufacturing engineering education does not come without challenges. While digital platforms can make learning more engaging, the technical complexity of engineering drawing necessitates structured frameworks that ensure proper sequencing of learning tasks and adequate scaffolding of cognitive load (Makitan et al., 2024a). Recent frameworks developed for vocational education emphasize the need for evidence-based approaches to multimedia-based performance assessments that can be adapted to technical subjects (Miaz et al., 2019). This framework supports the design of digital interventions that deliver content and provide platforms for real-time feedback and reflective learning, thereby addressing the dual challenges of engagement and technical proficiency. To meet the evolving demands of the manufacturing industry, engineering education must continue to leverage digital tools and social media within a structured framework that addresses both pedagogical effectiveness and the technical challenges inherent in subjects like engineering drawing. Future research should focus on refining these frameworks to optimize social media's contributions to collaborative learning and immediate feedback, ensuring that both formal and informal learning environments are effectively aligned with industry needs (Arifin & As'Ad, 2019; Harianto et al., 2020; Pu & Barnard, 2025; Swart & Macleod, 2021).

Integrating social media into manufacturing engineering education, particularly for teaching engineering drawing, addresses the need for pedagogical innovation in technical and vocational fields. Traditional, hands-on, classroom-based methods often struggle to engage students and meet the rapid evolution in industry demands. In contrast, digital tools and social media platforms provide dynamic, interactive environments that facilitate immediate feedback and collaborative learning. To systematically develop such an intervention, this study employs the ADDIE model, Analyze, Design, Develop, Implement, and Evaluate, to ensure the resulting teaching module is accessible and pedagogically sound (Sangsawang, 2015; Wang, 2024).

The Analyze phase of the ADDIE model identifies specific learner needs and contextual challenges associated with traditional manufacturing engineering drawing instruction. Research indicates that digital learning environments, particularly social media, can effectively promote engagement and peer-to-peer interaction, essential for learning technical disciplines (Waljinah et al., 2020). In the Design phase, instructional strategies are adapted to leverage the interactive affordances of social media platforms, fostering both asynchronous discussions and synchronous problem-solving exercises that mirror hands-on practices in a virtual context (Brown & Green, 2018). This design phase incorporates principles from established frameworks for multimedia-based performance assessment in vocational education, ensuring that the teaching module remains aligned with industry practices and learning outcomes(de Klerk et al., 2018; Hidayati et al., 2020; Razak, 2013) .

During the Development phase, content is curated and structured to meet the rigor of technical drawing education while taking advantage of digital media's flexibility. By integrating digital instructional materials that allow for iterative practice and immediate feedback, the module can accommodate diverse learner needs and effectively manage cognitive load, a concern addressed in prior research on instructional media design (Luthfi & Wardani, 2019; Prasetya et al., 2024; Rohana et al., 2022). Furthermore, incorporating social media tools supports collaborative learning. It enables educators to monitor individual progress and adjust instructional strategies in real-time, reflecting trends in digital transformation in education Sousa & Rocha, 2019.

The Implementation and evaluation phases are critical for assessing the module's effectiveness in bridging the traditional gap between theoretical instruction and practical application. The module's implementation in a controlled educational setting provides valuable insights into its scalability and adaptability. Evaluation methods, including formative assessments and summative performance measurements, are designed using frameworks successfully applied in vocational education contexts (Kazanidis et al., 2019; Sinaga & Manik, 2023). This dual approach of continuous evaluation and reflective practice ensures that the module can be refined based on empirical evidence, thereby supporting improved student outcomes in mastering engineering drawing skills. The deployment of a social-media-based teaching module, underpinned by the systematic ADDIE model and reinforced by contemporary instructional design frameworks, has the potential to transform manufacturing engineering education. By aligning digital engagement with structured pedagogical rigor, the proposed module aims to significantly enhance technical proficiency in engineering drawing and prepare students to meet the evolving needs of the manufacturing sector (Bergdahl et al., 2020; Bond & Bergdahl, 2023; Khan et al., 2017; Tai et al., 2019; Tim et al., 2017; Uma, 2023).

The main objective of this study is to assess the effectiveness of a social-media-based module in improving students' technical skills in engineering drawing. The research questions that guide this study are:

- To what extent does the social-media-based teaching module improve students' technical skills in manufacturing engineering drawing?
- How do students engage with and respond to the social media platform as a tool for learning engineering drawing?
- What are the perceived advantages and challenges of using social media for technical skill acquisition in engineering?

This study contributes to the growing field of

technology-enhanced education by demonstrating the effectiveness of utilizing social media to teach complex technical skills, such as those required in manufacturing engineering drawing. By integrating a social-media-based teaching module, the research builds on technological trends that have increasingly influenced educational practices across various technical disciplines (Green, 2016). The module harnesses digital platforms to deliver content and provide opportunities for interactive learning, immediate feedback, and collaborative problem-solving, which are critical for mastering complex tasks that have traditionally been confined to hands-on, in-person environments (Claro et al., 2018).

The design and evaluation of the module align with the paradigm shift towards integrating digital tools into academic curricula, as evidenced by recent investigations into technology use in both traditional and innovative educational settings (de Koster et al., 2017). This research underscores that digital engagement via social media can complement and enhance conventional teaching methods by catering to diverse learning styles and fostering peer-to-peer interaction. These factors are especially vital in technical fields like manufacturing engineering, where spatial reasoning and attention to detail are paramount. The study's findings reinforce the potential of social media to act as a catalyst for collaborative learning and provide insights for educators seeking to bridge the digital divide in curricula requiring a high degree of technical proficiency (Albin-Clark, 2024).

Furthermore, developing the module, guided by structured instructional design models, contributes to the theoretical framework supporting technology-enhanced education. It illustrates how social media's inherent features, such as real-time communication and content sharing, can be strategically leveraged to create engaging learning environments beyond traditional classroom boundaries. This not only enhances accessibility but also ensures that complex technical skills are taught effectively, thereby preparing students for the escalating demands of modern manufacturing industries (Vincent & Udeme, 2014). The study offers a comprehensive model of integrating digital technologies into technical education, enriching both the pedagogical literature and practical applications in curriculum design.

1. Method

This study follows a design-based research approach, combined with a quasi-experimental design, to develop and evaluate a social-media-based teaching module to improve students' skills in manufacturing engineering drawing. The methodology is structured around the ADDIE (Analyze, Design, Develop, Implement, Evaluate) instructional design model, ensuring a systematic, iterative process for module creation and evaluation (Hanafi et al., 2020). The research is divided into multiple stages, each contributing to the educational intervention's development, validation, and assessment.

1.1 Research Design

The research utilizes a design-based (DBR) framework, emphasizing iterative design and improvement based on real-world testing and feedback. The study employs a quasi-experimental pre/post-test design to assess the effectiveness of the social-media-based module. Participants are divided into an experimental group, which engages with the social media module, and a control group, which follows the traditional face-to-face classroom instruction.

1.2 Sampling

This study was conducted at a State Vocational High School in 68 East Jakarta, with 120 students enrolled in an introductory manufacturing engineering drawing course. Participants were randomly assigned to an experimental group (60 students) or a control group (60 students). All participants understood the basic engineering drawing concepts and had previously studied engineering courses. The study was conducted during a regular semester, with students attending classes twice a week.

1.3 Data Collection

Data were collected over 12 weeks, with the implementation phase during the semester's final six weeks. Ethical considerations included obtaining informed consent from all participants, ensuring anonymity in survey responses, and maintaining privacy regarding student submissions and feedback.

1.4 Data Analysis

The effectiveness of the social-media-based module was assessed by comparing pre-and post-test scores using paired-sample t-tests. Effect sizes (Cohen's d) were calculated to determine the magnitude of the difference. Analysis of covariance (ANCOVA) was also used to control for any baseline differences between the experimental and control groups. Thematic analysis was applied to open-ended student reflections to identify common themes and perceptions related to the social-media-based learning experience. This helped to understand the platform's impact on student engagement and the development of technical skills.

2. RESULTS AND DISCUSSION

This section presents the findings of the study evaluating the effectiveness of the social-media-based manufacturing engineering drawing teaching module. Data collected from quantitative and qualitative sources are analyzed to assess the impact of the module on students' technical skills, engagement, and learning experiences.

2.1 Need Analysis Finding

The needs analysis revealed that students faced challenges in mastering key concepts of manufacturing engineering drawing, particularly in orthographic projections, dimensioning, and understanding assembly drawings. The analysis also highlighted a preference for more interactive learning methods and an interest in utilizing social media for educational purposes. Students expressed a desire for visual, on-demand content that could facilitate both independent study and peer collaboration.

Instructors emphasized the need for a platform to provide immediate feedback and encourage active participation in practical assignments. Based on these findings, the social-media-based module was designed to address the gaps in traditional instruction by offering interactive, peer-reviewed assignments and immediate access to learning resources.

2.2 Module Design and Expert Validation Score

Three expert instructors in manufacturing engineering reviewed the instructional module to ensure its alignment with course objectives and instructional standards. The module received high ratings for content relevance and instructional clarity, with an overall content validity index (CVI) of 0.88, indicating strong expert consensus on the quality and effectiveness of the materials. The integration of social media platforms was also positively evaluated, with experts noting its potential to enhance student engagement and facilitate real-time feedback.

2.3 Implementation Metrics

- Participation: The experimental group consistently participated in the social-media-based module during the six-week implementation phase. On average, students posted 3–5 times per week on Instagram, engaging in both submission of their engineering drawings and providing peer feedback. The number of interactions (likes, comments, peer evaluations) per student ranged from 15 to 25 per week, indicating active involvement in the learning process.
- Completion Rates: The completion rate of assignments in the experimental group was 92%, significantly higher than the 80% completion rate in the control group. Students in the experimental group were more likely to complete assignments on time and engage with peer submissions, which was attributed to the social media module's interactive nature and the platform's social aspect.

2.4 Learning Outcome Analysis

Pre and post-test scores were analyzed to determine the impact of the social media-based teaching module on students' technical drawing skills, the results of which can be seen in Tables 1 and 2.

Table 1: Pre and Post-test Results

Group	*Pre Mean (SD)*	*Post Mean (SD)*	*Skill Gain (%)*	*p-Value*	*Cohen's d*
Experimental	58.3% (6.8)	73.4% (7.1)	15.1	0.001	1.21
Control	57.8% (6.5)	63.2% (6.3)	5.4	0.05	0.38

Table 2: ANCOVA Results

Statistic	*Results*
F(1,117)	21.34
p-Value	0.001

Within-Group Improvements

- *Experimental group*: Students exposed to the social-media-based teaching module improved their engineering-drawing scores by 15.1 percentage points (from 58.3 % to 73.4 %). A *p-value* < 0.001 and a Cohen's d of 1.21 indicate a statistically significant and large learning effect.
- *Control group*: Students taught with traditional methods gained 5.4 percentage points (from 57.8 % to 63.2 %). Although the gain reached statistical significance ($p < 0.05$), the effect size was small (d = 0.38), suggesting only modest practical improvement.

Between-Group Comparison (ANCOVA)

After adjusting for small baseline differences, ANCOVA showed a significant treatment effect ($F(1, 117) = 21.34$, $p < 0.001$). This confirms that the experimental group's larger gain is attributable to the social-media-based module rather than chance or initial score disparities.

Practical Meaning

- The large effect size in the experimental group translates to roughly 1.2 standard-deviation units of improvement—enough to move a typical student from the 50th to about the 88th percentile in drawing performance.
- The small effect in the control group (d ≈ 0.38) is consistent with normal learning progress expected over time without the new intervention.

Educational Implications

Implementing the module can substantially boost core engineering-drawing competencies, making it a promising addition or alternative to conventional instruction. Future work might explore scaling, long-term retention of skills, and which social-media features (peer feedback, short video demos, chat support) drive the largest gains.

Limitations & Next Steps

- Results are based on a single semester and one institution; replication across cohorts is needed.
- Qualitative data (student engagement analytics or interviews) could clarify *how* social-media interaction supports the observed learning gains.

2.5 Qualitative Findings

Thematic analysis of student reflections provided insights into their experiences with the social-media-based learning module. Four major themes emerged:

- Engagement: Students in the experimental group reported feeling more engaged with the learning material, attributing this engagement to the visual and interactive nature of the content. The ability to receive immediate feedback on their assignments and the opportunity to collaborate with peers were highlighted as key motivating factors.
- Peer Collaboration: Many students appreciated the peer review aspect of the module, noting that providing and receiving feedback helped them refine their skills and gain new perspectives on their drawings. After receiving constructive peer criticism, several students mentioned feeling more confident in their abilities.
- Real-Time Feedback: The quick turnaround of feedback on their submissions through social media was valued by students, who felt it helped them identify and correct errors more efficiently than traditional feedback methods. They also appreciated the flexibility of revisiting the material as needed.
- Challenges: Some students expressed concerns about the technical aspects of using Instagram and YouTube for educational purposes, such as difficulties navigating the platforms and accessing all course materials. A few students also reported feeling overwhelmed by the volume of assignments and feedback.
- The social-media-based module significantly improved the manufacturing engineering drawing skills of the experimental group, with a large effect size.
- Students in the experimental group demonstrated higher engagement, with increased participation and completion rates compared to the control group.
- Peer collaboration and real-time feedback contributed to students' skill improvement.
- While the social media platform facilitated active learning and peer interaction, some technical issues were encountered, which will be addressed in future iterations of the module.

These results suggest that social media can be a highly effective tool for enhancing technical education, particularly in fields that require skill development and practical application, such as manufacturing engineering.

2.6 Discussion

The results of this study provide compelling evidence of the effectiveness of a social-media-based teaching module for improving students' manufacturing engineering drawing skills. This discussion interprets the findings in the context of the theoretical framework, compares them with prior research, and outlines the pedagogical implications of using social media for teaching technical skills. Additionally, the study's limitations are acknowledged, and future directions for research are proposed.

2.7 Skill Improvement through the Lens of the Framework

The significant improvement in students' manufacturing drawing skills in the experimental group can be attributed to the deliberate and systematic application of the ADDIE instructional design framework. This model, which emphasizes analysis, design, development, implementation, and evaluation, provides a structured curriculum development system and tailors content to meet specific student needs (Sangsawang, 2015). By meticulously aligning the design to the learners' requirements, the module was able to bridge the gap between theoretical concepts and practical application, a critical factor in technical skill development, as supported by empirical evidence from vocational education studies (de Klerk et al., 2018).

Furthermore, integrating interactive features, such as peer reviews, quizzes, and real-time feedback, promoted active learning and reflective practice. These elements are consistent with the principles of experiential learning and deliberate practice theories, which assert that frequent and meaningful feedback is essential for developing expertise ((Chan, 2020; Chao-Fernandez et al., 2017). Such strategies facilitate cognitive engagement by requiring students to actively monitor, assess, and adjust their work, ultimately reinforcing the internalization of key drawing concepts and improving the overall quality of their technical skills.

In addition, leveraging social media platforms like Instagram and YouTube contributed significantly to the enhanced learning experience. These platforms support student-centred learning by offering asynchronous access to high-quality instructional videos and feedback. This flexibility allows students to revisit and review material at their own pace, thereby increasing the opportunity for knowledge retention and application in practical assignments (Nonthamand, 2024). Incorporating these familiar digital tools aligns with modern trends in digital learning environments and encourages self-directed learning by allowing continuous

engagement outside of traditional classroom settings. Combining a robust instructional design framework and the strategic integration of interactive and digital media components created a conducive learning environment. This multifaceted approach ensured that students were not only acquainted with the technical aspects of manufacturing drawing but also empowered to apply these skills in practical settings, leading to measurable improvements in their performance.

2.8 Comparison with Prior Studies on Digital

The emerging body of literature on technology-enhanced learning in engineering education highlights the efficacy of digital tools such as augmented reality, computer-aided design (CAD) software, and online learning platforms in improving technical skills(Salonen et al., 2021) . However, compared to these widely researched technologies, the application of social media in teaching complex technical concepts like manufacturing engineering drawing has not been thoroughly investigated. This study, therefore, makes a valuable contribution by demonstrating that social media, when deliberately integrated into instructional design, can offer a dynamic and collaborative learning environment that contrasts sharply with traditional face-to-face instruction and static learning materials.

Specifically, the social-media-based module leverages the unique affordances of platforms known for visual content, real-time interaction, and informal feedback to foster an environment of active learning and peer-to-peer collaboration. Research in computer-supported collaborative learning (CSCL) underscores the importance of intersubjective interactions, where learners collectively construct meaning through ongoing dialogue and feedback, for deep learning and skill acquisition (Stahl, 2015). The capacity for instant communication and mutual support on social media mirrors successful strategies observed in settings where peer feedback and instructor interaction have enhanced cognitive engagement and knowledge retention (Joshi et al., 2022; Makitan et al., 2024b). In this regard, the module in the present study supports effective skill development through immediate, context-sensitive feedback and encourages learners to participate in a constructive social learning process.

Additionally, the instructional design framework underpinning the module aligns with broader trends in digital pedagogy. Studies examining academic instruction in digital environments reveal that virtual platforms can effectively transcend the limitations imposed by traditional instructional methods by offering greater exposure to diverse, multimodal content and flexible, asynchronous interaction (Cohen & Soffer, 2015). This flexibility is particularly significant in engineering education, where the complexity of technical subjects often necessitates iterative learning and revisiting challenging content. Integrating social media thus extends the benefits of digital tools previously well demonstrated with CAD and augmented reality to a medium that further emphasizes collaboration and engagement.

Moreover, while prior research has predominantly focused on digital tools in professional or health-related education, evidence is beginning to emerge that social media interventions can be effective in enhancing skill acquisition. For example, interventions using social media to advance communication and collaborative skills in youth have yielded positive outcomes, reinforcing that these platforms can also be harnessed to support technical learning (Raghavendra et al., 2018). In sum, the study not only fills a gap in the existing literature but also underscores the potential of social media as a complementary tool that can enrich the learning experience in highly technical fields such as manufacturing and engineering drawing.

2.9 Pedagogical Implications

The results of this study have important implications for how manufacturing engineering drawing, and other technical subjects can be taught. When used strategically, social media platforms offer several pedagogical advantages over traditional methods. They facilitate:

- Active Learning: Social media encourages students to actively participate in the learning process by sharing their work, interacting with peers, and providing feedback. This fosters a deeper understanding of the material than passive learning methods like lectures and textbook reading.
- Collaborative Learning: The module's peer review and collaborative aspects mirrored the findings of Vygotsky (1978), who emphasized the importance of social interaction in learning. Peer feedback, in particular, was valuable for skill refinement, as students could learn from each other's mistakes and successes.
- Real-time Feedback: The immediate feedback on social media platforms allows students to correct errors quickly and apply new knowledge in subsequent assignments. This rapid feedback loop is especially important in technical subjects like engineering drawing, where precision and accuracy are critical.
- Flexibility and Accessibility: Using platforms like Instagram and YouTube makes learning materials more accessible, allowing students to revisit lessons and review their work at their own pace. This flexibility can support students with different learning styles and allow them

to engage with the material outside traditional class hours.

Given these advantages, integrating social media into engineering curricula could lead to more effective and engaging learning experiences. Educators are encouraged to explore the use of social media not only for engineering drawing but also for other areas of technical education that benefit from interactive, visual learning.

2.10 Affordances and Constraints of Social Media Platforms

While the results of this study are promising, there are several affordances and constraints associated with using social media platforms for teaching technical skills in engineering:

- Affordances:
  - Visual Learning: Social media platforms like Instagram and YouTube are inherently visual, which aligns well with the nature of engineering drawing, a subject that requires visual literacy and spatial reasoning. The ability to post images and videos of drawings allows students to engage with the content more directly and concretely.
  - Interactivity: The interactive nature of social media (e.g., comments, likes, peer reviews) fosters a more engaging and social learning environment, making students feel more connected to the material and their peers.
  - Peer Feedback: Social media enables students to receive feedback from instructors and their peers, which can be valuable in improving their technical skills through collaborative critique.
- Constraints:
  - Platform Dependence: The module's success partly depends on students' familiarity with and access to the chosen social media platforms. Some students may face technical issues or prefer alternative platforms, which could limit the module's effectiveness.
  - Distractions: While social media can enhance engagement, it also presents potential distractions. Students may become sidetracked by other content on the platform, which could reduce their focus on educational materials.
  - Privacy and Data Security: Privacy and data security concerns are inherent in using social media platforms. It is essential to ensure that students' personal information and course-related content are kept secure and that platforms are used consistently with ethical guidelines.

2.11 Study Limitations

Several limitations to this study should be acknowledged. First, the sample size was limited to students from a single institution, which may affect the generalizability of the findings. Future studies should aim to include multiple institutions and a more diverse student population to verify the results. Second, the study focused only on the short-term impact of the social-media-based module. Longitudinal studies are needed to assess the long-term retention of skills and the impact on students' future careers. Third, the study did not measure the potential impact of individual differences, such as prior experience with social media or engineering drawing, on the module's effectiveness. Future research should explore how these factors influence learning outcomes.

2.12 Recommendations

Based on the findings of this study, several recommendations can be made for educators and instructional designers:

- Incorporate Interactive Features: Educators should incorporate social media's interactive features—peer feedback, live discussions, and multimedia content—to promote active learning and collaboration in technical education.
- Ensure Platform Familiarity: Providing training or orientation sessions is important to ensure students are comfortable navigating the social media platforms used for educational purposes.
- Combining with Traditional Methods: Social media can enhance engagement and interaction, but it should be integrated with traditional teaching methods to create a balanced and comprehensive learning experience.

2.13 Future Research

Future research could explore the impact of different social media platforms on student engagement and skill acquisition in other technical subjects. Additionally, investigating the potential of integrating augmented reality (AR) and virtual reality (VR) into social-media-based modules for more immersive learning experiences could further enhance the effectiveness of these tools in technical education. Finally, research on the scalability and sustainability of such modules in diverse educational settings would provide valuable insights for broader implementation.

3. CONCLUSION

This study demonstrates that social media can effectively teach complex technical skills, such as manufacturing engineering drawing, dynamically and engagingly. By leveraging the interactive and visual nature of platforms like Instagram and YouTube, this study showed significant

improvements in students' technical skills and engagement compared to traditional face-to-face instruction. Integrating peer feedback, real-time interaction, and accessible learning materials created an environment that supported active learning and skill refinement.

The findings prove that social media platforms offer a valuable alternative to conventional teaching methods, enhancing students' ability to engage with content and collaborate with peers. Specifically, students in the experimental group showed a substantial improvement in their manufacturing drawing skills, with a large effect size, indicating that the module significantly impacted their technical abilities. The ability to receive immediate feedback and collaborate with peers through social media was key to this success.

While the study shows promising results, several challenges must be addressed in future implementations. Technical difficulties with platform navigation, potential distractions on social media, and privacy concerns are important considerations for educators looking to adopt this approach. Additionally, further research is needed to explore the long-term impact of social-media-based modules on skill retention and career outcomes and the scalability of such methods across different educational settings.

This study makes an important contribution to engineering education by showing that social media can be harnessed as an effective instructional tool for teaching technical skills. As technology continues to reshape educational practices, integrating social media into manufacturing engineering curricula offers a powerful way to enhance student learning and engagement. Educators are encouraged to explore and adapt this approach to their specific teaching contexts to better equip students with the skills needed in today's evolving manufacturing industry.

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