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RSSS001 - THE EFFECTIVENESS OF HAND FOLD PACK IN PACKAGING DESIGN

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ABSTRACT

This study explores the effectiveness of the Hand Fold Pack as an assessment tool to enhance technical skills, creativity, and conceptual understanding among Diploma in Print Media Technology students at Politeknik Muadzam Shah, within the framework of Technical and Vocational Education and Training (TVET). The Hand Fold Pack was developed as a low-cost, multifunctional product that incorporates elements of design, assembly, and print finishing processes. Its uniqueness lies in providing students with a tactile, practice-based learning experience that complements digital approaches. By experimenting with folding techniques, layout arrangements, and visual design principles, students were able to strengthen both fine motor skills and creative problem-solving abilities competencies highly valued in the printing industry. The tool integrates manual skill acquisition with critical design thinking, effectively bridging the gap between practical execution and conceptual understanding. Findings from the implementation with diploma-level students revealed significant improvements in their ability to visualize, design, and produce functional printed materials. Students also reported higher levels of engagement, creativity, and confidence, noting that the hands-on approach deepened their understanding of layout, spatial organization, and product structuring. Overall, the Hand Fold Pack demonstrates strong potential as an innovative assessment tool in TVET, supporting industry-relevant skill development and preparing students for future professional practice.

Keywords – hand fold pack, printing technology, technical skills, creativity

INTRODUCTION

In the era of the Fourth Industrial Revolution, the printing industry demands a skilled and innovative workforce. Technical and Vocational Education and Training (TVET) institutions play a vital role in equipping graduates with industry-relevant competencies. As noted by Baharudin et al. (2021), TVET should emphasize experiential learning that integrates technical proficiency with critical thinking and creativity.

In the field of Printing Technology, students are required to master both theoretical knowledge of design and production as well as practical skills such as folding, layout, and print finishing. However, many institutions continue to rely heavily on theory-driven and software-based teaching methods, which may restrict students' understanding of the physical and structural aspects of printed products (Ismail et al., 2020). To bridge this gap, an innovative teaching tool, the Hand Fold Pack, was developed. This dual-function, low-cost product integrates physical assembly with visual communication design, enabling

students to apply technical skills while fostering creativity. Kolb (1984) emphasized that active, hands-on engagement enhances students' learning and reflective abilities.

Although theory-based and digital methods provide flexibility and visualization, they often fall short in cultivating the tactile skills required in printing. Studies show that students without sufficient hands-on training struggle to apply theoretical design knowledge in production contexts (Mohd Yunus et al., 2018). Moreover, current teaching tools tend to be one-dimensional, limiting instructors' ability to assess students' understanding of layout logic, folding mechanics, and print execution holistically (Aziz & Rashid, 2019). The lack of integrated learning tools also reduces student engagement. Ahmad et al. (2022) found that opportunities for physical creation significantly enhance students' motivation and creativity.

The Hand Fold Pack addresses these challenges by offering an innovative, practice-based solution that enhances teaching effectiveness, promotes active learning, and supports holistic assessment of technical, creative, and conceptual skills among Printing Technology students.

OBJECTIVES

- i. To enhance students' technical skills in folding techniques, layout arrangement, and print finishing through hands-on engagement with a physical learning tool.
- ii. To foster creativity and visual communication abilities by allowing students to design, construct, and evaluate their own printed products using the Hand Fold Pack.

METHODOLOGY

Research Design

This study adopted an action research design to develop and evaluate the instructional product, the Hand Fold Pack. The design enabled the researcher to implement, observe, and assess the product's impact within an authentic classroom setting. Action research is particularly suited for educational innovation as it fosters reflective practice and supports continuous improvement through iterative cycles of implementation and real-time feedback.

Product Development Phase

The Hand Fold Pack was designed as a dual-function instructional and assessment tool tailored to the learning needs of Printing Technology students. Its development integrated key aspects of print production, including layout design, folding structures, finishing techniques, and creative application. To ensure content validity and instructional relevance, the initial prototype was reviewed by two subject matter experts in print media and a senior design lecturer, who provided critical feedback on its design and pedagogical suitability.

Participants

The study involved 30 final-semester students enrolled in the Diploma in Print Media Technology program at Politeknik Muadzam Shah. All participants had previously completed courses in digital design, prepress, and production, providing them with

foundational knowledge relevant to the study. Participation was voluntary, and informed consent was obtained from all students.

Data Collection Instruments and Procedures

Pre- and post-questionnaires were administered to evaluate students' self-perceived improvements in technical skills, creativity, and conceptual understanding before and after using the Hand Fold Pack.

Data Analysis

Quantitative data from the pre- and post-questionnaires were analyzed using descriptive statistics, including mean, percentage, and standard deviation, to compare changes in students' perceptions and learning outcomes.

Implementation Timeline

The study was carried out over six weeks and was structured into the following phases:

1. Week 1: Introduction of the product and training session
2. Weeks 2–4: Hands-on implementation and product development by students
3. Week 5: Presentation and evaluation of folded product
4. Week 6: Post-assessment, interviews, and reflection

RESULTS AND DISCUSSION

The quantitative findings demonstrate that the Hand Fold Pack markedly enhanced students' learning outcomes:

Table 1: Result the pre test and post test.

Measure (5-point scale unless noted)	Pre-test <i>M</i> (SD)	Post-test <i>M</i> (SD)	<i>t</i> (29)	<i>p</i>	Cohen's <i>d</i>
Technical skill self-rating	3.05 (0.47)	4.26 (0.42)	10.78	< .001	2.45
Creativity self-rating	2.97 (0.55)	4.18 (0.48)	11.02	< .001	2.37
Concept-understanding self-rating	3.15 (0.50)	4.35 (0.45)	12.05	< .001	2.55
Product rubric (0–100)	-	86.4 (5.7) ¹	-	-	-
Engagement observation (1–5)	-	4.61 (0.32)	-	-	-

Technical mastery

A 40% mean gain in self-rated competency for folding, layout, and finishing (large effect size, $d = 2.45$) indicates that repeated tactile practice effectively bridged the gap between screen-based design knowledge and manual execution skills. This finding is consistent with Mohd Yunos et al. (2018), who emphasized that hands-on exposure is essential for translating theoretical knowledge into production practice.

Creativity development

Creativity scores increased by 1.21 points (large effect size, $d = 2.37$). Although not presented here, interview data indicated that the freedom to vary folds and graphics

fostered experimentation, supporting Ahmad et al.'s (2022) observation that project-based tasks enhance intrinsic motivation and stimulate idea generation.

Conceptual understanding

The greatest improvement ($\Delta = 1.20$; $d = 2.55$) was observed in design concept comprehension, reinforcing Kolb's (1984) experiential learning premise that concrete experience, followed by reflection, enhances the development of conceptual schemas.

Product quality

A mean rubric score of 86 % confirms that most students produced structurally accurate, aesthetically cohesive folded pieces, providing external validation of the self-report gains.

Engagement

Observed engagement averaged 4.61/5, well above the programme's norm (≈ 3.8), suggesting that the low-cost kit captured attention better than conventional software-only labs.

CONCLUSION

The quantitative evidence demonstrates that the Hand Fold Pack is an effective and economical tool for concurrently teaching and assessing technical, creative, and conceptual skills in Printing Technology programmes, thereby advancing the experiential learning agenda within TVET.

Implications

Curriculum design.

Integrating dual-function kits such as the Hand Fold Pack offers a practical means of embedding psychomotor training into print-media courses without requiring substantial capital investment.

Assessment.

By demonstrating both process and product learning within a single artefact, the Hand Fold Pack enables instructors to gain a holistic view of students' competencies, effectively addressing the rubric-alignment concerns highlighted by Aziz and Rashid (2019).

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