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Relationship between Creation and Academic Performance in an Interest-Creation-Driven HyFlex Course

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Abstract: Hybrid-flexible (HyFlex) learning is an innovative pedagogical model that provides students with the flexibility to participate in learning via physical, online synchronous, or online asynchronous mode for each session. Most previous studies have found that interventions designed based on the creation loop of the Interest-driven Creator (IDC) theory had positive effects on academic performance among students. However, there is a lack of understanding regarding the relationship between creation and academic performance in the context of a HyFlex learning setting among Malaysian undergraduate students. This study designed and implemented an eight-week HyFlex instruction based on the creation loop of IDC theory. This study involved 65 undergraduate education majors who experienced the HyFlex course. Their perceived creation was measured via a creation questionnaire developed by the authors based on the creation loop of IDC theory. Their academic performance was measured by a rubric-referenced assessment. The results showed that the students reported a high perception of creation and obtained good academic performance. Nevertheless, Pearson correlation analysis revealed that creation was not significantly associated with academic performance. The findings indicate a potential gap between students' perceptions of creation and actual creative output quality. The insignificant results may also be due to the creation-assessment misalignment and the inherent challenges of HyFlex learning. Future qualitative studies could be conducted to explore the factors behind the insignificant results found in this study.

Keywords: HyFlex learning, interest-driven creator, e-book creation, academic performance, undergraduate students

1. Introduction

Hybrid-flexible (HyFlex) learning is a pedagogical model that combines in-person and online learning. In a HyFlex learning setting, students can choose to participate in a session via in-person, online synchronous, or online asynchronous mode for each session (Beatty, 2019). It was pioneered by Beatty (2019) in 2005, and it has gained increased prominence since the COVID-19 pandemic. Since then, numerous studies on HyFlex learning have been conducted. Previous studies indicate that a well-implemented HyFlex instruction can enhance academic performance, satisfaction, and accommodate diverse needs of tertiary-level learners (Barr & Luo, 2025). Students are able to maintain their learning progress while having the flexibility to fit their learning to their preferences and circumstances.

To cultivate a student-centered learning environment, HyFlex implementation should be underpinned by a framework that emphasizes students' learning interests and creativity, such as the interest-driven creator (IDC) theory (Chan *et al.*, 2019). The IDC theory comprises three loops: interest, creation, and habit loops (Chan *et al.*, 2019). The IDC theory focuses on

learning interests, opportunities to create, and the cultivation of learning habits among the students. It proposes that an instruction that relates to students' interests and allows them to create a learning product can develop lifelong learning among the learners (Chan *et al.*, 2019).

Although several previous studies have examined the potential effect of creation loop and academic performance (Huang *et al.*, 2020; Wang & Chen, 2024; Zheng *et al.*, 2021), these studies did not address the context of HyFlex learning. Thus, there is a knowledge gap regarding the relationship between students' creation and academic performance in a HyFlex learning setting. This paper is an extension of the previous study conducted by Teh *et al.* (2024), which found that learning interest (interest loop of IDC theory) significantly predicted academic performance among undergraduate students in a HyFlex learning environment.

2. Literature Review

2.1 Creation loop of Interest-driven Creator (IDC) Theory

The second loop of the IDC theory, the creation loop, has three dimensions: imitating, combining, and staging, as illustrated in Figure 1. According to Chan *et al.* (2019), the first dimension of the creation loop, "imitating", refers to the learner's process of gathering knowledge through the five senses. This is usually done by observing and mimicking a model, which could be an expert, a teacher, a character in a story, or an instruction presented in digital form. This dimension serves as a prerequisite for the creation process. This dimension is related to the lower levels of Bloom's taxonomy (Bloom *et al.*, 1956): remembering, understanding, and applying.

The second dimension, "combining", is the process of producing something original that is valuable to the relevant community based on the knowledge gathered in the "imitating" stage (Chan *et al.*, 2019). In this phase, students analyze multiple knowledge sources (models) and integrate them into a targeted creation that is defined by the instructor. This dimension is related to the higher levels of Bloom's taxonomy (Bloom *et al.*, 1956): analyzing, evaluating, and creating.

The third dimension, "staging", refers to students' demonstration of their product. This dimension focuses on improving the targeted creation through receiving feedback from the audience and developing students' positive emotions through receiving social recognition (Chan *et al.*, 2019). After "staging", the students might go through the creation loop again when they collect information from the feedback and revise their product based on the feedback. Chan *et al.* (2019) pointed out that all loops and dimensions within the IDC theory could occur in the form of a group or individual, except the staging component. This dimension can only emerge in the form of a group, as it involves both the demonstrator and the audience.

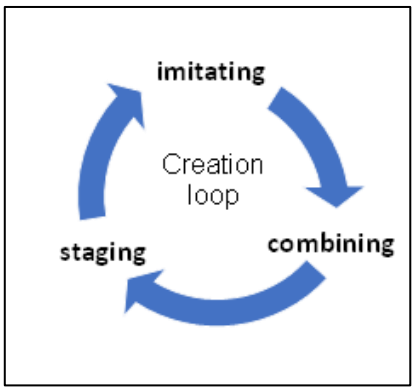

Figure 1. The creation loop of interest-driven creator theory.

2.2 Relationship between Creation and Academic Performance

A few previous studies have adopted the IDC theory to investigate the relationship between creation and academic performance. A quasi-experimental study investigated the impact of IDC intervention on English listening and speaking proficiency among 210 undergraduate students in a blended learning setting (Wang & Chen, 2024). The researchers found a significant increase in both proficiencies for the experimental group. The control group obtained a moderate and no significant increase in listening and speaking proficiency, respectively. Zheng *et al.* (2021) also conducted a quasi-experimental study with 52 pupils to examine the effects of an interest-driven-creation approach on mobile learning performance. The research found that the pedagogical approach significantly improved students' learning performance.

Another quasi-experimental (without control group) study conducted by Huang *et al.* (2020) adopted the creation loop of IDC theory. The study examined the effects of video creation on mathematics academic performance among 21 elementary students. The authors also found that the post-test scores were significantly higher than the pre-test scores. In sum, most previous studies have concluded the positive effects of creation on students' academic achievement. Nevertheless, the relationship between creation and academic performance in the context of a HyFlex learning environment among Malaysian tertiary students remains ambiguous. Thus, this study aims to provide empirical findings on this topic by examining the following research questions:

1. What is the extent of perceived imitating, combining, staging, and creation among the undergraduate students?
2. What is the extent of academic performance among undergraduate students?
3. What is the correlation between imitating, combining, staging, creation, and academic performance in an interest-creation-driven HyFlex course?

3. Methodology

3.1 Context of Interest-Creation-Driven HyFlex Instruction

An eight-week HyFlex instruction was designed and implemented by the first author. The HyFlex course was the lab sessions of the Educational Technology course offered by the Faculty of Educational Studies, Universiti Putra Malaysia. For each session, students were given the freedom to participate physically, online synchronously, or online asynchronously. The HyFlex classroom was equipped with two wireless microphones and a 350^o overhead camera. Zoom.us was used as the online conference call software. The integration of these hardware and software enabled the researcher to capture high-quality audio and video of both the instructor and students.

The HyFlex instruction was designed based on the interest and creation loops of IDC theory. The students started by gathering knowledge of creating an e-book through the instructor's scaffolding and self-learning (imitating). Subsequently, the students utilized the knowledge to create their e-book (combining). Finally, they conducted micro-teaching using their e-book and received feedback from their peers and instructor (staging) before the submission of their assessment. The summative assessment of the HyFlex instruction was an educational e-book. The students were required to submit their e-book two weeks after the micro-teaching. Figure 2 shows two sample e-book pages of one of the students.

Figure 2. Two pages of an E-book created by one of the students.

3.2 Data Collection and Analysis

The researchers developed a creation questionnaire based on the creation loop of IDC theory to measure the extent of perceived creation among the students. As presented in Table 1, the questionnaire comprised 17 items, with six, five, and six items for imitating, combining, and staging, respectively. All items utilized a five-point Likert scale (1 = very untrue to 5 = very true). A pilot study with 30 undergraduate students from the same faculty was conducted to examine the reliability of the items. Based on Table 1, the questionnaire obtained an overall Cronbach alpha, α value of .89, with values of .78, .83, and .86 for the imitating, combining, and staging dimensions, respectively. These values indicated the internal consistency of the items.

Table 1. *Internal Consistency of Creation Questionnaire*

Variables	Number of items	α
Imitating	6	.78
Combining	5	.83
Staging	6	.86
Overall	17	.89

The academic performance of the students was measured by a rubric-referenced e-book assessment. An analytic rubric was used in this study. Its rating scale ranged from unsatisfactory to exemplar while the criteria comprised learning content, use of media, principles of visual message design, as well as effort and originality. The questionnaire and assessments were validated by a panel of two experts. This study employed the Pearson product-moment correlation approach to examine the relationship between creation and academic performance. 69 students participated in the HyFlex course, but only 65 participants were included in the data analysis due to incomplete responses. Among the 65 participants, 22 were male, while 43 were female. Seven participants were students from China, while 58 of them were Malaysians. All of them were enrolled in the Bachelor of Education degree program.

4. Findings and Discussions

Table 2 shows that the mean scores for imitating, combining, and staging dimensions of the creation loop were 4.63 (SD = 0.45), 4.45 (SD = 0.52), and 4.51 (SD = 0.62), respectively. The mean score of overall perceived creation was 4.53 (SD = 0.42). These high mean scores suggest that the students were provided with ample opportunities to gather knowledge about creating an educational e-book, apply the knowledge through creating their unique e-book, as well as present their e-book to their counterparts and receive feedback from them. As shown

in Table 2, the mean academic performance score was 22.73 (SD = 2.26) out of a maximum of 30, which corresponds to 75.77%. This indicates an overall good performance among the students.

Table 2. *Descriptive Statistics of Perceived Creation and Academic Performance*

Variables	Mean	Std. Deviation	N
Imitating	4.63	0.45	65
Combining	4.45	0.52	65
Staging	4.51	0.62	65
Creation	4.53	0.42	65
Academic Performance	22.73	2.26	65

Based on Table 3, there was a negative nonsignificant correlation between creation and academic performance (r = -.027, p < .01). Specifically, all three dimensions of creation loop: imitating (r = .021, p < .01), combining (r = .012, p < .01), and staging (r = -.081, p < .01), were not significantly correlated to academic performance. This suggests that more opportunities to gather e-book creation knowledge, create an e-book, and present the e-book did not imply a higher e-book assignment score among the students. The findings did not align with previous studies, which found a positive and significant effect of interest-creation-driven pedagogical approach on students' academic performance (Huang *et al.*, 2020; Wang & Chen, 2024; Zheng *et al.*, 2021).

The nonsignificant correlations, particularly the negative correlation between staging, creation, and academic performance, were intriguing from the perspective of IDC theory. This indicates a potential disparity between students' perception of their engagement with the dimensions of the creation loop and the quality of their creative output. The high self-reported perception of imitating, combining, and staging may reflect students' enthusiasm or effort rather than strategic execution that leads to quality e-book creation. Another potential theoretical explanation of the insignificant correlation is the creation-assessment misalignment. Students deeply engaged in the creation process may prioritize exploration over rubric compliance, costing them points for specific criteria. On the contrary, students who focused solely on following the rubric's requirements with less creative process might achieve higher scores.

Table 3. *Pearson Correlation between Perceived Creation and Academic Performance*

Variables	1	2	3	4	5
1. Imitating	1				
2. Combining	.513**	1			
3. Staging	.406**	.398**	1		
4. Creation	.771**	.793**	.803**	1	
5. Academic Performance	.021	.012	-.081	-.027	1

**Correlation is significant at the 0.01 level (2-tailed).

From a practical standpoint, the nonsignificant correlation may be due to the disparities between perceived value of creation and the actual impact on academic performance. Some students did not fully revise their e-book based on the feedback they received during the micro-teaching session (staging). While students may have reported higher engagement in staging, the lack of substantive revisions limited the quality of their final submissions. Moreover, the inherent challenges of HyFlex learning, such as students' self-regulation, technological problems, and unequal learning experience between learning modes, may mediate students'

creation experiences and academic performance. For instance, students who learnt via online asynchronous mode may feel less engaged in the creation process but managed to fulfill the rubric's criteria of the academic assignment.

5. Conclusion

In summary, this study found that the undergraduate students reported a positive perception of the creation loop of IDC theory (imitating, combining, staging) in the HyFlex course. They also achieved a good academic performance on average. However, the students' perception of the creation process was not significantly correlated with their academic performance. This suggests that students who perceived themselves as highly engaged in the imitating, combining, and staging phases of the creation loop did not necessarily achieve higher assessment scores in a HyFlex learning environment. While this study contradicts most previous findings, it sheds light on the potential factors that could diminish the positive impact of interest-creation-driven pedagogy on academic performance in a HyFlex course. These factors include the disparity between students' perception and actual performance, assessment misalignment with the creation process, as well as the inherent challenges of HyFlex learning.

The findings imply that practitioners should design assessments that explicitly reward evidence of successful dimensions of the creation loop in an interest-creation-driven HyFlex instruction. Future researchers could collect qualitative data on how students engage in the creation process and how the process influences their academic achievement. Data triangulation between quantitative and qualitative data could be performed to elicit insights into the insignificant relationship between creation and academic performance.

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