

Does Learning Interest Predict Academic Performance in an Interest-driven HyFlex Course?

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Abstract: Learning interest has been found to have insignificant and significant relationships with academic performance among students. This study aims to examine the association between learning interest and academic achievement among undergraduate students who underwent a Hybrid-flexible (HyFlex) course which was designed and implemented based on the interest loop of Interest-driven Creator (IDC) theory. In the HyFlex learning setting, students had the autonomy to learn physically, online synchronously, or online asynchronously for each class session. 48 undergraduate students from the faculty of education at a public university in Malaysia participated in this study. Pearson correlation analysis shows a significant positive correlation between learning interest and academic performance. A simple linear regression analysis found that learning interest contributed significantly to academic performance. This implies that the integration of the IDC theory into HyFlex learning could have the potential to foster interest and enhance performance among undergraduate students. However, the small effect size of learning interest indicates that while it is pertinent to cultivate learning interest among learners, academic achievement could be affected by other factors beyond interest.

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

1. Introduction

The Hybrid-flexible (HyFlex) learning model emerged in 2005 and has gained significant prominence since the coronavirus disease 2019 (COVID-19) pandemic (Wong *et al.*, 2023). In a HyFlex course, learners can choose to learn physically, online synchronously, or online asynchronously for each class session (Beatty, 2019). Nowadays, tertiary students are juggling multiple roles such as student, worker, or job seeker (Mills, 2020). Students appreciated the inherent flexibility and accessibility of HyFlex learning as they are allowed to choose the delivery mode which best suits their learning style, preferences, and circumstances (Bakach, 2021; Shek *et al.*, 2022), which enabled learners to maintain (Lightner & Lightner-Laws, 2016) or boost (Amirova *et al.*, 2023) their academic achievement when compared to conventional learning mode.

In the 21st-century educational landscape, the role of educators has shifted from being the knowledge transmitter to the facilitator of learning, and traditional teacher-centred learning also morphed into the current student-centred learning. Hence, it is crucial to develop learning interests among students. Student learning interest has been a focal point for the past three decades. Schiefele (1991) postulated that learning interest plays a key role in promoting motivation and learning outcomes. The author also proposed that successful learning is characterized by the cognitive and emotional components within learners which are

determined by their level of interest. Similar sentiments on the pertinence of learning interest in enhancing learning outcomes were also shared by Mary Ainley et al. (2002) as well as Renninger and Hidi (2016).

2. Literature review

2.1 Interest loop of Interest-driven Creator (IDC) theory

The interest loop is the first of the three anchors of the IDC theory. As presented in Figure 1, three dimensions, namely triggering, immersing, and extending are involved in the interest loop. According to Wong et al. (2020), triggering interest is the first component of the interest loop, it refers to arousing learners' early curiosity in a topic by being exposed to extraordinary information, challenging tasks, or puzzles which present a knowledge gap between their current level of understanding and the aspired achievement. This results in a heightened willingness to participate and motivation in seeking new information to "quench the thirst for knowledge". Nevertheless, as students gain more knowledge, their curiosity may be reduced.

Therefore, it is important to sustain students' interest by the second stage of the interest loop, "immersing interest". The intent of this stage is for students to undergo activities which allow them to experience the "flow" state. In this state, learners experience a deep emotional involvement, a sense of control, and become unaware of time passing (Wong et al., 2020). By immersing students in the flow state, they have a higher tendency to develop individual interest in the third and final phase of the interest loop. "Extending interest" emphasizes the meaningfulness of the activities, which is the extent to which the learning process is associated with learners' existing knowledge and their daily lives (Wong et al., 2020). This enables students to transform their situational interests into individual interests, fostering self-regulated learning among the students. When the instructional design is meaningful to the students, they can create questions and challenges that go beyond the task given (Wong et al., 2020).

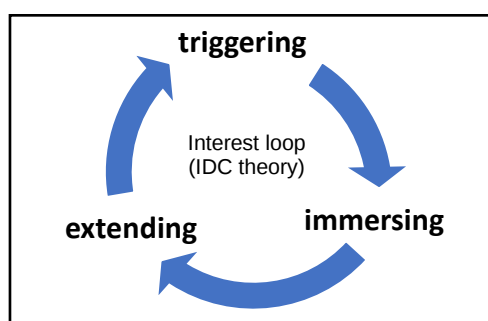


Figure 1. The interest loop of interest-driven creator theory.

2.2 Relationship between Learning Interest and Academic Performance

The IDC theory was adopted by several recent studies in various learning contexts. It was found that students' mathematics performance was improved (Huang *et al.*, 2020) but another study found no significant relationship between student learning interest and academic performance (Wong & Wong, 2019). Kong and Wang (2019) concluded that learning interest is positively associated with robotics creation. It was also proved that IDC-based instruction improved students' digital information literacy better than non-IDC instruction (Mohammadi, 2024). Collectively, these studies have demonstrated the IDC theory's validity as a theoretical proposition and its potential effectiveness in shaping learning activities that stimulate learners' interest. Thus, the design, development, implementation, and evaluation of the HyFlex course in this study were underpinned by the IDC theory. However, how learning interest relates to

and predicts academic performance among students in a HyFlex learning setting remains ambiguous. Hence, this study aims to answer the following research questions:

1. What is the extent of undergraduate students' learning interest and academic performance in a HyFlex learning environment?
2. What is the relationship between learning interest and academic performance among undergraduate students in a HyFlex learning environment?
3. How does learning interest predict academic performance among undergraduate students in a HyFlex learning environment?

3. Methodology

The HyFlex course of this study is the lab session of the Educational Technology course offered by the education faculty in a public university in Malaysia. For each lab session, students had the freedom to decide to participate through any of the three participation modalities: physical, online synchronous, and online asynchronous. The video and audio of both the instructor and the students in the physical classroom in all lab sessions were recorded with high-definition quality. This is achieved by utilizing an overhead 350° camera that was mounted on the ceiling, two wireless clip-microphones, and the premium version of Zoom.us, which is an online conference call platform. The session recordings and weekly updates were shared through Discord, an online social community platform which was used as the learning management system for the HyFlex course in this study.

The HyFlex learning course was designed, developed, and implemented according to the three components of the interest loop. For instance, one of the course assessments was to create a virtual educational scavenger hunt using Gather.town. As illustrated in Figure 2, Gather.town is an online platform which allows users to create their virtual avatar to navigate around a customizable virtual environment and interact with other users in that space. To trigger student's interest, they underwent a virtual scavenger hunt created by the researchers using the same platform. After their curiosity was aroused, they were briefed about the success criteria of the assignment and taught the ways to create the virtual environment through Gather.town. This allowed students to be immersed in the process of creating their own online space for their scavenger hunt design. Following the immersing of interest is the extending of interest. As this assignment requires students to create a virtual scavenger hunt which educates the players on the topic of physical education, it is closely associated with the future careers of the students.

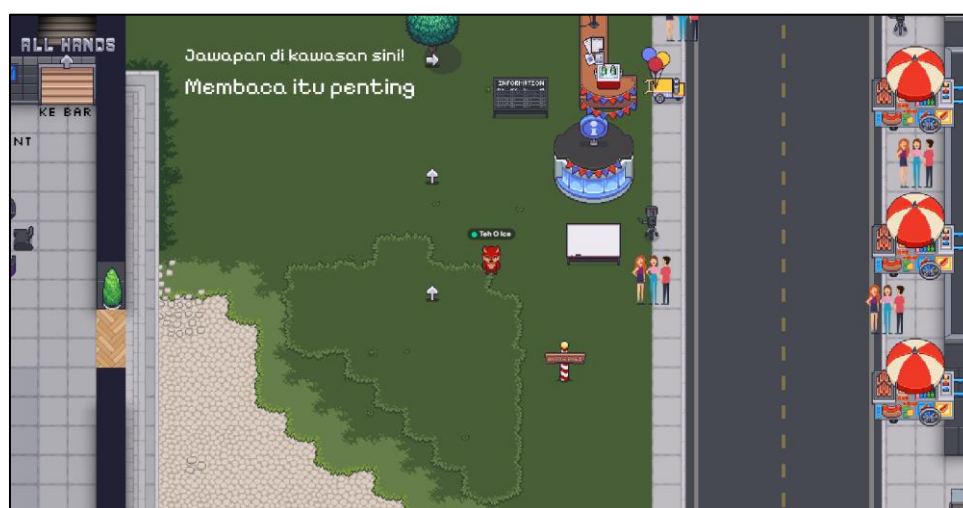


Figure 2. A screenshot of Gather.town space created by the students.

The Pearson product-moment correlation approach was adopted in this study to determine the relationship between students' learning interests and academic performance. A

simple linear regression analysis was conducted to examine the extent to which students' learning interest could predict their academic performance. The authors developed a learning interest questionnaire based on the three dimensions of the interest loop of IDC theory to measure the level of learning interest among the students. A five-point Likert scale (1 = very untrue to 5 = very true) was used for all the items. Table 1 shows a few items of each dimension of the learning interest questionnaire. A pilot test was conducted with 30 undergraduates from the education faculty to examine the reliability of the learning interest questionnaire. An overall Cronbach alpha, α value of 0.93 was obtained for the learning interest items, with values of 0.80, 0.89, and 0.88 for the dimensions of triggering, immersing, and extending respectively. These values signified the reliability of the items.

The extent of their academic performance was determined by the final score of their academic assignment. Both the learning interest questionnaire and academic assessments were evaluated by the second and other authors to ensure their validity. Out of the 59 undergraduate students who underwent the HyFlex course, 48 of them completed the learning interest questionnaire. The participants of this study comprised 25 females and 23 males, and over 75% of them were 22 years old. All of them were in their fifth semester of the Bachelor of Education (Physical Education) program.

Table 1. *Sample Items of the Learning Interest Questionnaire*

Dimension	Sample items
Triggering	• The learning activities conducted were novel to me. • The learning activities were exciting for me.
Immersing	• Time seemed to pass by unnoticed when I was doing the activities. • I was focused when doing the learning activities.
Extending	• I can relate my old knowledge to the new knowledge I gained from the course. • I think I can apply what I learnt from the course in my future career.

4. Findings

Based on Table 2, the mean score of student learning interest is 4.38 (SD = .61) while the mean score of their academic achievement is 77.45% (SD = 1.62) among 48 undergraduate students.

Table 2. *Descriptive Statistics of Learning Interest and Academic Performance*

	Mean	Std. Deviation	N
Learning interest	4.38	0.61	48
Academic performance	77.45%	1.62	48

Table 3 shows that there was a positive significant relationship between learning interest and academic performance ($r = .42, p < .01$) among the students in the HyFlex course. Given the significant correlation between learning interest and academic achievement, a simple linear regression was calculated to predict academic performance based on learning interest among the students. Based on Table 4, a significant regression equation was found, $F(1, 46) = 10.01, p = .003$. The R^2 value of .179 indicates that 17.9% of the variance in students' academic performance was explained by their learning interests. The regression equation (academic performance = $10.57 + 1.12$ learning interest) signifies that for each one-point increase in students' learning interest, the predicted academic performance increases by approximately 1.12 percentage points.

Table 3. *Pearson Correlation between Learning Interest and Academic Performance*

Variables	1	2
1. Learning interest	-	
2. Academic performance	.42**	-

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

* . Correlation is significant at the 0.05 level (2-tailed).

Table 4. *Results of Simple Linear Regression between Learning Interest and Academic Performance*

Factors	<i>b</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>	<i>p</i>
Constant	10.571	1.570		6.733	.000
Learning interest	1.124	.355	.423	3.164	.003

$F = 10.012$ $R = .423$ $\text{Sig-}F = .003$ $R^2 = .179$

5. Discussion

Findings from this study postulated that students had a high learning interest in the HyFlex course. This is reflected in the studies done by Bakach (2021) and Shek *et al.* (2022) which also showed that students had high overall satisfaction towards the HyFlex learning model. This suggests that learners' interest in learning could be fostered in a HyFlex learning environment by integrating learning activities which are underpinned by the interest loop of IDC theory. Results of this study also showed that students could attain a moderately high level of academic achievement in a HyFlex learning setting. This finding is in line with a few previous studies which concluded that students were able to achieve similar or higher academic grades than their peers who learnt through the traditional learning models (Amirova *et al.*, 2023; Lightner & Lightner-Laws, 2016).

The flexibility provided by HyFlex learning allows students to engage with the subject content based on their needs, they could also continue learning when they fall ill or are confronted with urgent matters. Furthermore, students could access the recorded sessions, learning materials, and discussions ubiquitously. This not only enables students to learn remotely but also provides more learning opportunities for students who struggle to comprehend the subject content during synchronous lessons, fostering a more personalized learning environment. Collectively, these aspects of HyFlex learning have the potential to foster learners' interest in learning and enhance their academic attainment.

This potential is shown through the significant contribution of learning interest towards academic performance found in this study. Although this finding is in contrast with studies conducted by Wong and Wong (2019), it resonates with findings by Kong and Wang (2019), Huang *et al.* (2020), and Mohammadi (2024). This implies the importance of cultivating learning interest among students as those with higher learning interests tend to perform better academically. Educators should design and implement learning activities with students' interests in mind, for instance, utilizing the interest loop of IDC theory as the theoretical foundation of instruction. Nevertheless, since only 17.9% of the variance in academic performance is explained by learning interest, this signifies that students' academic performance may be impacted by other factors beyond learning interest such as instructor effectiveness, personal characteristics, and socio-economic status. This also suggests that while learning interest plays a significant role in academic achievement, the extent of influence by interest towards performance may vary among different individuals. For example, some students may excel academically even without high levels of learning interest whereas others may struggle despite being highly interested in the learning content.

6. Conclusion

A HyFlex instruction was designed and implemented based on the interest loop of IDC theory. This study showed that students experienced high learning interest and performed well academically, indicating the potential of HyFlex learning as an effective instructional model among undergraduate students. A significant contribution of learning interest towards academic achievement was also found in this study, implying the practicality of the interest loop of IDC theory in practice as well as the pertinence of developing learning interest among undergraduate students in a HyFlex learning environment. However, this study also suggests that learning interest is only one of several factors impacting students' academic achievement, implying the complexity of undergraduate student's learning achievement.

It is important to acknowledge that the generalizability of this study's findings is limited to a population with a similar background to the small sample size of this study. Future studies with larger and more diverse samples are recommended. Also, other potential factors which could influence the level of academic achievement among students should be included in future studies so that a deeper understanding of student's academic performance can be obtained. Qualitative research could also be conducted to delve into the intricate association between student learning interest and academic performance.

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References

- Ainley, M., Hidi, S., & Berndorff, D. (2002). Interest, learning, and the psychological processes that mediate their relationship. *Journal of Educational Psychology*, 94(3), 545–561.
- Bakach, B. (2021). *Investigating the HyFlex Modality: Students' Satisfaction and Impact on Learning* (Doctoral dissertation, University of Houston).
- Beatty, B. J. (2019). *Hybrid-Flexible Course Design (1st ed.)*. EdTech Books.
- Huang, M. C. L., Chou, C. Y., Wu, Y. T., Shih, J. L., Yeh, C. Y., Lao, A. C., ... & Chan, T. W. (2020). Interest-driven video creation for learning mathematics. *Journal of Computers in Education*, 7, 395-433.
- Kong, S. C., & Wang, Y. Q. (2019). Nurture interest-driven creators in programmable robotics education: an empirical investigation in primary school settings. *Research and Practice in Technology Enhanced Learning*, 14(1), 20.
- Mills, L. (2020). Understanding the experiences of college students who work full-time: Juggling competing responsibilities and defining academic success. *The Journal of Continuing Higher Education*, 68(3), 181-189.
- Mohammadi, M. (2024). Digital information literacy, self-directed learning, and personal knowledge management in critical readers: Application of IDC Theory. *Research and Practice in Technology Enhanced Learning*, 19, 004-004.
- Renninger, K. A., & Hidi, S. (2016). *The power of interest for motivation and engagement*. Routledge.
- Schiefele, U. (1991). Interest, learning, and motivation. *Educational Psychologist*, 26(3-4), 299-323.
- Shek, D., Zhu, X., Li, X., Dou, D. (2022). Satisfaction with Hyflex teaching and law-abiding leadership education in Hong Kong university students under COVID-19. *Applied Research Quality Life*, 5(17), 2833-2858.
- Wong, B. T., Li, K. C., Chan, H. T., & Cheung, S. K. (2023). HyFlex Learning Research and Practice: A Longitudinal Analysis. *Sustainability*, 15(12), 9699.
- Wong, L. H., Chan, T. W., Chen, W., Looi, C. K., Chen, Z. H., Liao, C. C., ... & Wong, S. L. (2020). IDC theory: interest and the interest loop. *Research and Practice in Technology Enhanced Learning*, 15(1), 1-16.
- Wong, S. L., & Wong, S. L. (2019). Relationship between interest and mathematics performance in a technology-enhanced learning context in Malaysia. *Research and Practice in Technology Enhanced Learning*, 14(1), 1-13.