Volume 2 Number 1 2024 page 24-28
Doi: 10.33084/ijue.v2i1.7510

IJUE
International Journal of Universal Education
ISSN: 3046-5249

Effect of Hyflex Learning on Student's Academic Performance in Education Technology in Kwara State

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Research Article

Citation Information:
Danyaro, A., Attah, J. O. ., & Sallah, B. H. . (2024). Effect of Hyflex Learning on Student's Academic Performance in Education Technology in Kwara State. *International Journal of Universal Education*, 2(1), 24–28. https://doi.org/10.33084/ijue.v2i1.7510

Received: March 2024

Revised: April 2024

Accepted: May 2024

Published: June 2024

ABSTRACT

The study examined the effect of Hyflex learning on Student's Academic Performance in Education Technology in Kwara State. The study was guided by two research questions and two null hypotheses were postulated for the study. The study adopted a quasi-experimental research design of a 2 x 2 factorial design. The target population was all 400-level undergraduate students in the Department of Educational Technology offering EDT 412. A sample size of 152 undergraduate students participated in the study. Two groups were involved in the study which are both intact classes. The experimental group where full-time undergraduate students while the control group was sandwich undergraduate students. The instrument used for data collection was an educational technology performance test which was validated by three educational technology experts. Descriptive statistics of mean and standard deviation were used to answer the research questions while inferential statistics of t-test were used to analyse the research hypothesis. The findings of the study revealed that Hyflex learning effectively improved the performance of undergraduate students in education technology. Both male and female undergraduate students in the experimental group performed better than their counterparts in the control group, though the male students had a higher mean score than their female counterparts. There is a significant difference between the mean post-test score of students taught educational technology using Hyflex learning relative to their counterparts taught using the lecture method and there is a significant interaction effect of gender on the mean scores of students in the experimental group. It was therefore recommended among others that institutions should adopt hyflex learning as a pedagogy because it offers flexible learning opportunities among undergraduate students.

Keywords: Hyflex Learning, Student's Academic Performance, Educational Technology

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INTRODUCTION

Education has been evolving to meet the ever-changing landscape of the world and society. Innovations, trends, and technologies in education are changing the landscape, culture, and environments in education which have influenced higher education to allow different modes of instruction for students. Face-to-face, hybrid, blended, and online learning provide students flexibility on how they consume course content. However, it does not provide student choice (Koskinen, 2018). In higher education, students need flexibility (Thurnau, 2022). Higher education institutions must recreate and redefine their value by investing in tools to improve student success. For higher education to remain relevant in the post-pandemic era, both physical and virtual learning spaces must be incorporated into pedagogical practices (Penrod, 2022).

Enhancing course offerings by implementing a HyFlex strategy for academic programs will augment the student experience and help higher education institutions remain relevant in the changing educational landscape (Penrod, 2022). HyFlex is a combination of hybrid and flexible. A HyFlex course delivery method is a blending of online and face-to-face delivery (hybrid) in a single course where students choose when and how (flexible) they attend the course (Parra & Abdelmalak, 2016). HyFlex enables teachers to teach students at the same time in a physical classroom and synchronously online through video-conferencing software (Kohnke & Moorhouse, 2021). The HyFlex course model has the potential to address the many challenges and barriers facing the learners of today (Thurnau, 2022). HyFlex learning provides students with a choice of how they attend class through face-to-face, synchronous, and asynchronous technology (Koskinen, 2018).

A HyFlex course simultaneously offers face-to-face, online synchronous, and online asynchronous instruction modalities. Students can choose to attend each session that works best for their current circumstances (Bakach, 2021). HyFlex is an ideology, a way of doing business, and a strategy for providing expanded educational opportunities to students (Penrod, 2022).

The flexibility of HyFlex allows freedom to choose how to participate in assigned activities, especially regarding attendance mode. Students with schedule conflicts, travel difficulties, or other legitimate reasons preventing in-class participation are no longer left with no option but to miss those learning opportunities and can have an alternative (Beatty, 2019). HyFlex courses are geared toward improving adult students' educational opportunities by providing access, convenience, and flexibility (Abdelmalak & Parra, 2016).
For students who are unable to attend class due to illness or university-sponsored travel, participating remotely is likely to be far more beneficial than missing class. Students who were unable to participate even remotely or those who may have forgotten something discussed in class or benefited from the review have the option of accessing the class recordings. The flexibility of how to attend class daily may yield additional benefits such as reduced travel time to the classroom that can be used more productively. The HyFlex approach has affordances particularly advantageous for learners with disabilities (Mentzer et al., 2023). The fundamental advantage of the HyFlex approach for improving student academic performance is that it gives flexibility to students with varying limitations, such as unpredictable job schedules, difficult family circumstances, sicknesses, or a variety of other difficulties (Mentzer et al., 2023).
Gender may affect the abilities of students to be able to learn effectively, especially when it comes to the use of information and communication-related issues. Gender is a socioeconomic variable for analyzing roles, responsibilities, constraints, and needs of men and women in a given context. It refers to the social and cultural constructs that each society assigns to behaviors, characteristics, and values attributed to men and women (Hajara & Mustapha, 2013). Mankumari and Ajayi (2017) examined gender differences in the academic performance of students. The study found significant gender differences in the academic performance of students. The female students were found outperforming their male counterparts. Malczyk's (2019) experiment involving the implementation of HyFlex instruction in an undergraduate social welfare policy course found that most students chose to participate online. Specifically, 72 percent of the students attended most classes online, while 28 percent attended in person. Forty-four percent of students completed everything online, 17 percent completed all activities face-to-face, and the remaining 39 percent blended their learning according to their personal needs.
Bakach (2021) assessed the students' satisfaction with the HyFlex modality and their perceptions of its impact on their learning. The results of the quantitative analysis indicated that 93.1% were satisfied with the HyFlex vii modality. Only 4.3% were dissatisfied. Also, 95.7% of students perceived that the HyFlex modality had a positive impact on their learning. The findings from the qualitative analysis revealed that students' satisfaction and the positive impact were mainly attributed to the flexible attendance mode, which enabled them to balance the demands of their education and other obligations and eliminated many personal stressors. The recorded lectures were reported as highly beneficial to students' learning outcomes.
Miller et al (2013) conducted an experiment involving undergraduate students enrolled in a statistics course offered in the HyFlex modality. The findings of the study revealed no statistically significant difference between the HyFlex and traditional courses in the student's learning and performance. The study also revealed that 95% of the students in the Hyflex course expressed that they valued the learning options they were offered and the instructional technology support provided. However, 5% of the students preferred F2F lectures with little or no instructional technology. The data also showed that 38% of the students preferred purely online lectures, and 57% valued the availability of the different learning opportunities. Lakhal et al (2014) conducted a quantitative study involving 439 students enrolled in a 10-week HyFlex undergraduate management information systems course. The study's objective was to determine the effectiveness of HyFlex courses in terms of student satisfaction and academic performance. The researchers compared the satisfaction to the learning/performance of the students that fell in the following four attendance groups: 100% F2F, 100% synchronous online, 100% asynchronous online, and mixed modality attendance. All students were given free choices of their mode of attendance. The researchers measured the academic performance by the student scores on a multiple-choice test, a written exam, and other course assignments. The results revealed only one statistically significant difference between the modalities in both satisfaction and performance. The satisfaction and performance were significantly higher for the students who attended the course synchronously than those who attended the course 100% asynchronously.
Kyei-Blankson et al (2014) conducted a mixed methods study to determine the students' attendance choices, their learning experiences, and their level of satisfaction in a HyFlex course. The study findings showed that the students' choices of the mode of attendance were influenced by flexibility, weather conditions, and convenience. It also showed that 71% of the students appreciated the freedom to choose their mode of attendance on a class-by-class basis. Over 85% of the students indicated that they would enroll in similar courses because of the flexibility of the participation policy. The students also noted that both the F2F and online delivery formats met their learning needs and expectations equally. They reported that their choices of attendance mode did not hinder their performance in the course and that they had equally meaningful learning in both the online and traditional environments. Specifically, 95% of the students reported high levels of satisfaction, and 71% showed a high level of satisfaction in both learning in both environments. However, 29% of the students indicated that the online environment was the most satisfactory.
The purpose of the study is specifically to determine the post-test achievement scores of students taught educational technology courses using Hyflex learning relative to their counterparts taught using lecture method and Examine the interaction effect of gender and Hyflex learning or lecture method on achievement of students taught educational technology.
The following research questions were posed and answered in the study:

1. What are the post-test achievement scores of students taught educational technology courses using Hyflex learning relative to their counterparts taught using the lecture method?

2. What is the interaction effect of gender and Hyflex learning or lecture method on the achievement of students taught educational technology?

METHOD

The study adopted a quasi-experimental research design of a 2 x 2 factorial design. The population for the study consisted of all undergraduate students at the University of Ilorin. The target population was all 400-level undergraduate students in the Department of Educational Technology offering EDT 412. A sample size of 152 undergraduate students participated in the study. Two groups were involved in the study which are both intact classes. The experimental group where full-time undergraduate students while the control group was sandwich undergraduate students. The experimental group was taught educational technology using Hyflex learning. The Hyflex course allowed students to attend the lecture sessions in various modes: in person, synchronously online, a combination of the two modalities and remotely watching a recorded session. The control group was taught educational technology via the lecture method. The two groups were given a pre-test after which the treatments were administered. Both groups were posted and tested after 6 weeks. The instrument used for data collection was an educational technology performance test which was validated by three educational technology experts. The coefficient of internal consistency value of 0.82 was obtained for the instrument using the split-half method. Data collected were analyzed using descriptive and inferential statistics. Descriptive statistics of mean and standard deviation were used to answer the research questions while inferential statistics of t-test were used to analyze the research hypothesis at 0.05 level of significance.

RESULTS AND DISCUSSION

Research Question one: What are the post-test achievement scores of students taught educational technology courses using Hyflex learning relative to their counterparts taught using the lecture method?

Table 1. *Mean achievement scores of students in the experimental and control group*

Groups	Pretest Mean	Pretest SD	Posttest Mean	Posttest SD	N	Mean Gain
Hyflex Learning	15.00	2.817	25.28	2.786	64	9.83
Control	14.00	4.239	23.11	3.894	88	9.54
Difference	+1.00	-1.422	+2.17	-1.108	24	+0.97

Table 1 shows the mean post-test scores of the two groups. The Hyflex learning group has a higher mean (25.28) with a lower SD (2.79) than the control group with a mean of 23.11 and an SD of 3.89. the difference between the mean gain score of the experimental group and the control group was minimal (+.97).

Research Question Two: What is the interaction effect of gender and Hyflex learning or lecture method on the achievement of students taught educational technology?

Table 2. *Interaction effect of Gender on the performance of students after treatments*

Gender	N	Groups	Pretest Mean	Pretest SD	Posttest Mean	Posttest SD	Mean Gain
Male	35	Hyflex Learning	15.31	2.878	25.83	2.802	10.52
Female	44		14.39	4.706	24.20	3.974	9.81
Difference			0.92	-1.827	1.63	1.172	1.11
Male	29	Control	15.62	2.783	24.62	2.665	9.27
Female	44		12.75	3.584	22.02	3.527	9.00
Difference			2.87	-0.801	2.6	0.862	0.27

Table 2 shows the mean scores, the standard deviations, and the mean gain scores of experimental and control groups by gender. For the varied teaching techniques, Male students taught using Hyflex learning had a higher mean score of 10.52 as against their female counterparts who had a mean score of 9.8. In the control group, male students had a mean score of 9.27 while the female students had a mean score of 9.00. Therefore, the male students had a higher mean score than their female counterparts.

Ho_1: there is no significant difference between the mean post-test score of students taught educational technology using Hyflex learning relative to their counterparts taught using the lecture method

Table 3. *Comparison of experimental and control groups on students' post-test scores*

Groups	N	Mean	SD	t-cal	Df		t-crit	P-value	Decision
Hyflex Learning	64	25.83	2.786						
				6.02	151	0.05	1.96	.000	Rejected
Control	88	23.11	3.894						

Table 3 shows that the students taught educational technology using the Hyflex method had a mean score of 25.28 with a standard deviation of 2.786, while the students taught using the lecture method had a mean score of 23.11 with a standard deviation of 3.894. The t-calculated of 6.02 is greater than the t-critical of 0.96, while the p-value is .000(P<0.005). The null hypothesis which states that there is there is no significant difference between the mean post-test score of students taught educational technology using Hyflex learning relative to their counterparts taught using the lecture method is rejected. Hence the alternate hypothesis was accepted; there is a significant difference between the mean post-test score of students taught educational technology using Hyflex learning relative to their counterparts taught using the lecture method.

$H0_2$: there is no significant difference between male and female students in the experimental group

Table 4. *t-test analysis on gender differences in academic performance*

Groups	N	Mean	SD	t-cal	Df		t-crit	P-value	Decision
Male	35	25.83	2.802						
				1.09	78	0.05	1.96	.009	Rejected
Female	44	24.20	3.974						

From the analysis in Table 4, male students were 35, while female students were 44. The mean and standard deviation were 25.83, 2.802 for male students, and 24.20, 3.974 for females. The calculated t-value was 1.96 while the sig value is .009. hence since sig. value (p=.009<0.05) is lesser than 0.05 at 78 degrees of freedom, the null is rejected. Therefore, there is a significant interaction effect of gender on the mean scores of students in the experimental group.

Discussion

Results from research question one and hypothesis one indicated that there was a significant effect of treatment on undergraduate students' academic performance in educational technology. This implied that the Hyflex learning has a significant influence on students' academic performance in educational technology. In other words, students who were exposed to this strategy performed better in educational technology than students in the control group. The inherent potentials of Hyflex learning to actively engage students, allow flexibility, and provide a student-centered style of educational delivery may be accountable for this improvement in students' achievement following the experiment. The findings of the study agree with Lakhal et al (2014) who revealed that satisfaction and performance were significantly higher for the students who attended the course synchronously than those who attended the course 100% asynchronously. Also, the findings of the study agree with Miller et al (2013) who revealed that 95% of the students in the Hyflex course expressed that they valued the learning options they were offered and the instructional technology support provided. However, 5% of the students preferred F2F lectures with little or no instructional technology.

Findings from research question two and hypothesis two revealed that the male students had a higher mean score than their female counterparts. There is a significant interaction effect of gender on the mean scores of students in the experimental group. The findings of the study are not in agreement with Mentzer et al (2023) who reported that there were no significant variations in gender or ethnicity between students who elected not to attend the HyFlex remotely daily compared to those who chose to attend one or more class sessions remotely. The findings of the study are also not in agreement with Schneider and Preckel (2017) who reported that there were no significant differences in course success rates for male students between BlendFlex, face-to-face, and online instructions.

CONCLUSION

Based on the findings of this study, the use of Hyflex learning enhances students' performance in educational technology courses better than the lecture method. This educational paradigm shift encourages autonomous learners to benefit from the flexibility of this delivery format.

REFERENCES

Abdelmalak, M. M., & Parra, J. L. (2016). Expanding learning opportunities for graduate students with HyFlex course design. International Journal of Online Pedagogy and Course Design (IJOPCD, 6(4), 19-37.

Bakach, B. (2021). Investigating the Hyflex Modality: Students' Satisfaction and Impact on Learning. PhD Dissertation in Learning, Design and Technology University of Houston.

Beatty, B. J. (2019). Hybrid-Flexible Course Design (1st Ed.). EdTech Books. Retrieved from https://edtechbooks.org/hyflex

Hajara, U. S., & Mustapha, H. K. (2013). Gender and Information and Communication Technologies (ICTS) in Nigeria: Challenges and Prospects. Global Journal of Human Social Science, sociology and culture 13 (6), 51-58.

Kohnke, L., & Moorhouse, B. L. (2021). Adopting HyFlex in higher education in response to COVID-19: students' perspectives. Open Learning: The Journal of Open, Distance and e-Learning, 36(3), 231-244. Retrieved from https://doi.org/10.1080/02680513.2021.1906641

Koskinen, M. (2018). Understanding the Needs of Adult Graduate Students: An Exploratory Case Study of a Hyflex Learning Environment. PhD thesis College of Professional Studies Northeastern University Boston, Massachusetts.

Kyei-Blankson, L., Godwyll, F., & Nur-Awaleh, M. A. (2014). Innovative blended delivery and learning: Exploring student choice, experience, and level of satisfaction in a Hyflex course. International Journal of Innovation and Learning, 16(3), 243-252.

Lakhal, S., Khechine, H., & Pascot, D. (2014). Academic students' satisfaction and learning outcomes in a Hyflex course: Do delivery modes matter? World Conference on E-Learning in corporate, government, healthcare, and higher education (E-Learn), 1075-1083.

Malczyk, B. R. (2019). Introducing Social Work to HyFlex Blended Learning: A Student-Centered Approach. Journal of Teaching in Social Work, 39(4/5), 414–428.

Mentzer, N. J., Isabell, T. M., & Mohandas, L. (2023). The impact of interactive synchronous HyFlex model on student academic performance in a large active learning introductory college design course. Journal of Computing in Higher Education, 1-28. doi:https://doi.org/10.1007/s12528-023-09369-y

Miller, J. B., Risser, M. D., & Griffiths, R. P. (2013). Student choice, instructor flexibility: Moving beyond the blended instructional model. Issues and Trends in Educational Technology, 1(1), 8-24.

Parra, J., & Abdelmalak, M. (2016). Expanding Learning Opportunities for Graduate Students with HyFlex Course Design. International Journal of Online Pedagogy and Course Design, 6(1), 19–37.

Penrod, J. (2022, March 25). Staying Relevant: The Importance of Incorporating HyFlex Learning into Higher Education Strategy. Retrieved from EDUCAUSE Review: https://er.educause.edu/articles/2022/3/staying-relevant-the-importance-of-incorporating-hyflex-learning-into-higher-education-strategy

Schneider, M., & Preckel, F. (2017). Variables associated with achievement in higher education: a systematic review of meta-analyses. Psychological Bulletin, 143(6), 565–600.

Thurnau, L. (2022). HyFlex: A hybrid model providing flexibility for learners. C2C Digital Magazine Spring-Summer 2022.

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