Journal of Science Research and Reviews

PRINT ISSN: 1595-9074
E-ISSN: 1595-8329
DOI: https://doi.org/10.70882/josrar.2024.v1i1.9
Homepage: https://josrar.esrgngr.org

Original Research Article

Enhancing Academic Performance with AI-Powered Tools: A Comparative Study of Adobe Photoshop and Lightroom in Educational Technology Photography

[1]Adigun, Joseph O., [2]Nuhu, Kehinde M., [2]Oyetunde, Deborah I., *[1]Irunokhai, Eric A., [3]Wealth, Samuel A., [4]Ayangbekun, Oluwafemi J.,[1] Meduna, Patience Ndidi and [1]James, Zacchaeus

[1]Federal College of Wildlife Management, New-Bussa Nigeria
[2]Department of Educational Technology, University of Ilorin
[3]Onigambari Research Station, Forestry Research Institute of Nigeria
[4]Federal Polytechnic Ayede, Oyo State
*Corresponding Author's email: ericooleric@gmail.com

KEYWORDS
Artificial,
Intelligence,
Adobe Photoshop,
Lightroom,
Photography.

CITATION
Adigun, J. O., Nuhu, K. M., Oyetunde, D. I., Irunokhai, E. A., Wealth, S. A., Ayangbekun, O. J., Meduna, P. N., & James, Z. (2024). Enhancing Academic Performance with AI-Powered Tools: A Comparative Study of Adobe Photoshop and Lightroom in Educational Technology Photography. *Journal of Science Research and Reviews*, *1*(1), 43-48.. https://doi.org/10.70882/josrar.2024.v1i1.9

ABSTRACT
Artificial Intelligence (AI) encompasses various technologies that enable machines to perform tasks that typically require human intelligence, including educational applications with photography not left behind. This study investigates the comparative effects of AI tools in Adobe Photoshop and Lightroom on undergraduates' academic performance in an Educational Technology Photography course university of Ilorin. A total of 42 students participated, with 52.4% trained in Photoshop and 47.6% in Lightroom. The gender distribution was 59.5% male and 40.5% female. Survey results indicated a universally positive perception of both AI tools, with no disagreements recorded. Respondents rated both tools highly in terms of ease of use, preference for learning, confidence in skills, and essentiality for professional editing. Achievement test scores revealed excellent performance ($\mu > 80\%$) for students using both tools, with no significant gender differences. The findings suggest that AI-powered tools in Adobe Photoshop and Lightroom significantly enhance students' learning experiences and academic performance. The study highlights the potential for integrating AI tools in educational settings to improve learning outcomes and recommends further research into their long-term impacts, ethical implications, and effectiveness across diverse disciplines and educational contexts.

INTRODUCTION

Education system is as old as human existence experiencing divers of growth along with different tools and approaches to impact the lives of the students. Education is necessary element of humanity and crucial for the development of a nation (Hafeez et al., 2020). The education system has been exposed to far reaching technological developments in information technological section including the intervention of Artificial Intelligence (Tuomi, 2018; Basha, 2024). The traditional classroom which entails physical gathering of students has also be updated with online classrooms where physical contacts is degrading based on the inputs of technological innovations. Since Education is necessary element of humanity and crucial for the development of a nation (Hafeez et al., 2020), its development is crucial to all. Digital technologies have brought changes to the nature and scope of the education systems to adopt policies for ICT integration (Timotheou *et al.*, 2023). In fact it is documented the connection between AI and education

involves three areas: learning with AI (e.g. using AI-powered tools in the classroom), learning about AI (its techniques and technologies), and preparing for AI (e.g. the potential impact on all citizens) enabling better understanding (Sawant and Vaghela, 2022). The system of education across globe strive balance between the traditional and technological teaching methods. The goal remains consistent: to equip students with the critical thinking skills and knowledge base required to navigate an increasingly complex world. As we progress into the future, education will continue to transform, reflecting the dynamic nature of human society. The need for technological improvements has cut across all fields of endeavor with the education field been the far front as its developments has serious impacts across other professions and field.

Technological development has enabled artists to use different media to express their ideas (Licul, 2020), which photography has become an integral. As photographic images are increasable seen in everyday life through different mediums (Miles & Howes, 2015). With more people having access to camera nowadays especially through mobile phones (Vellanki, 2022) and has becomes a substantial part of most youths via various mobile devices and applications (Niemelä-Nyrhinen & Seppänen, 2023). Photography education plays a fundamental role in a national development by cultivating a skilled workforce, promoting creativity and innovation, preserving cultural heritage, and contributing to economic growth and social progress (Ogunmola, 2024) and with increase in various application and AI tools for photography such as photoshop, etc. just as it has been identified as a powerful tool that enhance teaching and learning processes (Oksanen et al, 2024).

In the literatures as established AI is gaining attention in education research (Kenchakkanavar 2023; Nurtayeva *et.al*, 2023) just as photography supports visualization representation (Clements, 2014). The integration of AI into the creative domain has opened new opportunities for designers, empowering them with innovative tools to enhance their design capabilities (Ramdurai and Adhithya, 2023). Yongcai (2024) itemized some photography processes automated by AI which include editing/sharpening, noise reduction, skin smoothing, color correction, facial recognition, and photo generator. Batley and Glithro (2024) presented the synergy of AI generative fill in Adobe Photoshop with the undergraduate students against the traditional manual methods with every participants agreed with AI better results was obtained. Mohamed (*et.al*., 2021) presented a a report on effectives of computer program base on Photoshop where (44) students (14) males and (30) females from the intermediate and secondary schools in the Jazan region were trained on Photoshop though not on the AI tools aspect.

The aim of this study is to investigate the comparative effect of Artificial intelligence (AI) tools in enhancing undergraduate academics performance in photography using Photoshop and Lightroom.

Research Hypothesis

The following hypotheses were formulated at 0.05 level of significance to guide this study:

$H0_1$: there is no significant influence of gender on the effects of Photoshop AI tools for learning

$H0_2$: there is no significant influence of gender on the effects of Lightroom AI tools for learning

MATERIALS AND METHODS

This study used quasi-experimental type, non-randomized, two experimental group design. Forty-two (42) students were selected using stratified random sampling to ensure representation from various academic standings and demographics. The students were randomly divided into two (2) groups. With group 1 taught Adobe Photoshop AI tools while the other were taught with Lightroom AI tools. Photography Skills and Knowledge Achievement Tests (PSKAT) pre-test and post-test was conducted for both groups and were exposed to training in the use of Adobe Photoshop and Light room AI – tools respectively along with questionnaire. The data collected was analyzed using descriptive statistics (frequency count, cross tabulation of percentages and mean), t-test and analysis of variances (ANOVA) using SPSS data analysis package.

RESULTS AND DISCUSSION

Table 1: AI tools students were trained in

	Frequency	Percent	Valid Percent	Cumulative Percent
Adobe Photoshop	22	52.4	52.4	52.4
Lightroom	20	47.6	47.6	100.0

Source: Field Survey (2024)

Table 1 shows that 22 (representing 52.4%) of the respondents were trained in Adobe Photoshop while the remaining 20 (representing 47.6%) were trained in Lightroom. It also shows that a total of forty two (42) students were used for the study.

Table 2: Distribution of respondents according to Gender

	Frequency	Percent	Valid Percent	Cumulative Percent
Male	25	59.5	59.5	59.5
Female	17	40.5	40.5	100.0
Total	42	100.0	100.0	

SOURCE: Field Survey (2024)

Table 2 shows that 59.5% of the respondents are male while the remaining 40.5% are female. This shows a fair representation of both genders.

Table 3: Students' reaction towards learning with Photoshop AI tool

ITEMS	Options				
	SA	A	U	D	SD
AI in Adobe Photoshop has improved my photography editing skills	4(19%)	17(81%)	0(0%)	0(0%)	0(0%)
AI in Adobe Photoshop helps me understand photography editing concepts better	4(19%)	17(81%)	0(0%)	0(0%)	0(0%)
AI in Adobe Photoshop enhances my creativity in photography editing	4(19%)	17(81%)	0(0%)	0(0%)	0(0%)
AI in Adobe Photoshop provides valuable feedback on my photography editing work	5(23.8%)	16(76.2%)	0(0%)	0(0%)	0(0%)
AI in Adobe Photoshop saves me time in photography editing	4(19%)	17(81%)	0(0%)	0(0%)	0(0%)

Source: Field Survey (2024)

According to Table 3, the majority of respondents believed that AI tools in Adobe Photoshop enhance their creativity in photography editing and help them understand photography editing concepts which is in full agreement with the work of Batley and Glithro (2024) as the undergraduate participant's positively adopted the emerging technologies in the AI Adobe Photoshop.

Table 4: Students' reaction towards learning with Lightroom AI tool

ITEMS	Options				
	SA	A	U	D	SD
AI in Adobe Lightroom has improved my photography editing skills	5(23.8%)	16(76.2%)	0(0%)	0(0%)	0(0%)
AI in Adobe Lightroom helps me understand photography editing concepts better	10(47.6%)	11(52.4%)	0(0%)	0(0%)	0(0%)
AI in Adobe Lightroom enhances my creativity in photography editing	11(52.4%)	10(47.6%)	0(0%)	0(0%)	0(0%)
AI in Adobe Lightroom provides valuable feedback on my photography editing work	11(52.4%)	10(47.6%)	0(0%)	0(0%)	0(0%)
AI in Adobe Lightroom saves me time in photography editing	12(57.1%)	9(42.9%)	0(0%)	0(0%)	0(0%)

Source: Field Survey (2024)

Table 4 reveals that the majority of respondents concur that AI tools in Adobe Lightroom foster creativity in photography editing and facilitate understanding of photography editing concepts. Overall, the respondents' feedback indicates a uniformly positive reception of Lightroom AI tools, with no dissenting opinions recorded.

Table 5: Comparative effects of Lightroom and Photoshop AI tools for learning

B1	Mean	N	Std. Deviation
Adobe Photoshop	4.8238	21	.27369
Lightroom	4.3667	21	.40042
Total	4.5952	42	.41021

Source: Field Survey (2024)

The comparative analysis presented in table 5 was conducted to evaluate the effects of Lightroom and Photoshop AI tools on learning. The results shows that the mean rating for Photoshop (4.8238) is higher than that of Lightroom (4.3667), indicating that respondents perceived Photoshop AI tools as more effective for learning with the indication that respondents perceived Photoshop AI tools as more effective for learning than Lightroom AI tools. Both tools received high ratings, indicating overall satisfaction with their effectiveness. However despite this significant discovery there was no direct available literature to support or negate this findings.

Table 6(a): Influence of gender on the effects of Photoshop AI tools for learning

Gender	Mean	N	Std. Deviation
Male	4.6222	9	.31929
Female	4.1750	12	.35194
Total	4.3667	21	.40042

Source: Field Survey (2024)

The analysis of Table 6(a) indicates that male students generally perceive the effects of Photoshop AI tools for learning more positively than female students, as evidenced by the higher mean score for males which negates the findings of (Mohamed *et.al*., 2021) where female benefits more than male counterpart in the Photoshop training and against the study of Marzouk *et al.,* (2013), which concluded that there are no significance differences between males and females. The responses within each gender group are fairly consistent, with males showing slightly less variability in their ratings compared to females. The total mean score suggests an overall positive perception of Photoshop AI tools for learning among all respondents.

Table 6(b): Influence of gender on the effects of Lightroom AI tools for learning

Gender	Mean	N	Std. Deviation
Male	4.7688	16	.29375
Female	5.0000	5	.00000
Total	4.8238	21	.27369

Source: Field Survey (2024)

The analysis presented in table 6(b) shows that both male and female students have high mean scores, indicating a positive perception of Lightroom AI tools for learning. Female students rate the tools slightly higher than male students, with a mean score of 5.0000 compared to 4.7688 for males. The lack of variability in female responses suggests a unanimous positive perception among the small sample of female students. Overall, the data suggest that students generally perceive Lightroom AI tools as beneficial for learning, with very little variability in their ratings. Both tools received high ratings, indicating overall satisfaction with their effectiveness. However despite this significant discovery there was no direct available literature to support or negate this findings.

Hypothesis 1: There is no significant difference in effects of Photoshop AI tools and Lightroom AI tools for learning photography

Table 7: Descriptive statistics depicting achievement test scores of students taught in Photoshop and Lightroom AI tools

AI tools used	Mean	Std. Deviation	Mean difference	Test of Sig.	Remark
Adobe Photoshop	86.1364	10.11032	4.14	0.243	Not Significant
Lightroom	82.0000	12.50263			

Source: Field Survey (2024)

Table 7 shows the achievement test scores of students taught with both Photoshop and Lightroom AI tools. It was shown that students taught with both AI tools possessed excellent performance (μ > 80%). It further showed that even though students taught with Photoshop possessed comparatively higher average score, the higher average score tends to be insignificant (p > 0.05). Both tools received high ratings, indicating overall satisfaction with their effectiveness. However despite this significant discovery there was no direct available literature to support or negate this finding

Hypothesis 2: There is no significant influence of gender on the effects of Lightroom AI tools for learning photography

Table 6: Gender influence on the effects of Lightroom AI tools for learning photography

AI tools used	Mean	Std. Deviation	Mean difference	Test of Sig.	Remark
Male	80.0000	13.69306	2.083	0.692	Not Significant
Female	82.0833	10.10363			

Source: Field Survey (2024)

Table 8 shows the achievement test scores of male and female students taught with Lightroom AI tool. It was shown that both male (μ = 80.00%) and female (μ = 82.08%) students taught with Lightroom AI tool possessed achievement test 1excellent performance (μ >= 80%) which was not comparatively different from each other significantly (p > 0.05). Both tools received high ratings, indicating overall satisfaction with their effectiveness. However despite this significant discovery there was no direct available literature to support or negate this finding.

Hypothesis 3: There is no significant influence of gender on the effects of Photoshop AI tools for learning photography

Table 7: Descriptive statistics depicting achievement test scores of students taught in Photoshop and Photoshop AI tools

AI tools used	Mean	Std. Deviation	Mean difference	Test of Sig.	Remark
Male	80.3125	12.1749	3.69	0.545	Not Significant
Female	84.0000	12.50263			

Source: Field Survey (2024)

Table 9 shows the achievement test scores of male and female students taught with Photoshop AI tool. It was shown that both male and female students taught with Photoshop AI tool possessed excellent performance (μ >= 80%) which was not comparatively higher than each other significantly (p > 0.05).

CONCLUSION

The study confirms that AI-powered tools in Adobe Photoshop and Lightroom are highly effective in enhancing students' learning experiences and academic performance. The positive reception across both genders and the high achievement scores reinforce the importance of integrating AI tools in educational technology courses. Future research could further explore the long-term impacts of these tools on students' skills and career readiness, as well as investigate any potential differences in perceptions across diverse educational contexts.

REFERENCES

Basha, J.Y.(2024) The Negative Impacts of AI Tools on Students in Academic and Real-Life Performance. INTERNATIONAL JOURNAL OF SOCIAL SCIENCES AND COMMERCE1:3.Pp:1-16. https://doi.org/10.51470/IJSSC.2024.01.03.01.

Batley, A and Glithro, R.(2024). Exploring the synergy of AI generative fill in photoshop and the creative design process utilising informal learning, 26th international conference on engineering and product design education, 5-6 september 2024, Aston university, Birmingham, United Kingdom.

Clements, M. K. A. (2014). Fifty years of thinking about visualization and visualizing in mathematics education: A historical overview. In Mathematics & mathematics education: Searching for common ground (pp. 177-192). https://doi.org/10.1007/978- 94-007-7473-5_11

Hafeez, M., Kazmi, Q. A., Tahira, F., Hussain, M. Z., Ahmad, S., Yasmeen, A., Iqbal, J., & Saqi, M. I. (2020). Impact of School Enrolment Size on Student's Achievements. Indonesian Journal of Basic Education, 3(1), 17-21. https://doi.org/10.34007/jehss.v3i1.170

Kenchakkanavar, A.Y. (2023) Exploring the Artificial Intelligence Tools: Realizing the Advantages in Education, Journal of Advances in Library and Information Science, 12: 4, pp-218-224.

Licul, N.(2020), Teachers' Views on the Use of Photography in Teaching Arts in Croatian Primary Schools, C.E.P.S. Journal, 10: 4, pp.187-205.

Marzouk, E.A.; Al-shrbeni, Atif M. (2013). The effectiveness of a training program in developing emotional intelligence and its impact on developing social skills for children with attention deficit hyperactivity disorder in the primary school. Journal of Educational and Human Studies, College of Education, Damanhour University, Volume 5, (4)

Miles, S., & Howes, A. (2015). Photography in educational research: Critical reflections from diverse contexts. Routledge. https://doi.org/10.4324/9780203740316

Mohamed,M.G.A., Mahmoud, K.M., Bashir, A.A. (2021). The Effectiveness of a Computer Program Based on Photoshop in Design and Decoration and Its Impact on Emotional Intelligence Among Children Aged (11-17 Years) At Jazan Region, Kingdom Saudi Arabia, International Journal of Scientific Research in Science and Technology, 8 (3) : 670-690, doi : https://doi.org/10.32628/IJSRST2183144

Niemelä-Nyrhinen, J., & Seppänen, J. (2023). Photography as play: Examining constant photographing and photo sharing among young people. Visual Communication, 22(4), 581-599. https://doi.org/10.1177/14703572211008485

Nurtayeva, T.,Salim, M., Taha, T.B., and Khalilov,S.(2023) The influence of ChatGPT and AI Tools on the Academic Performance, YMER, 22:6, pp. 247-258.

Ogunmola, M. O. (2024), The fundamental role of photography education in national development, Journal of Liaoning technical university natural science edition, 18:6, pp.207-214.

Oksanen, S. M., Hannula, M. S., & Laine, A. (2024). The potential of photography for mathematics education and research–A literature review. International Electronic Journal of Mathematics Education, 19(3), em0780. https://doi.org/10.29333/iejme/14613

Ramdurai B. and Adhithya P. (2023). The Impact, Advancements and Applications of Generative AI., International Journal of Computer Science and Engineering.

Sawant, H. and Vaghela, M.D. (2022). Effect of Artificial Intelligence on Education, international Journal for creative research Thoughts, 10:10, pp.58-514.

Timotheou S, Miliou,O., Dimitriadis, Y ., Sobrino, S.V., Giannoutsou, N.,Cachia,R., Monés, A.M., and Ioannou, A. (2023). Impacts of digital technologies on education and factors infuencing schools' digital capacity and transformation: A literature review, Education and Information Technologies, 28:6695–6726 https://doi.org/10.1007/s10639-022-11431-8

Tuomi, I., 2018. The Impact of Artificial Intelligence on Learning, Teaching, and Education. The Joint Research Centre (JRC), the European Commission's science and knowledge service, pp. 1–47

Vellanki, V. (2022). Shifting the frame: Theoretical and methodological explorations of photography in educational research. Cultural Studies: Critical Methodologies, 22(2), 132-142. https://doi.org/10.1177/15327086211045976

Yongcai, C. (2024). Artificial Intelligence Technology in Photography and Future Challenges and Reflections, The Frontiers of Society, Science and Technology, 6:6, pp.24-30, DOI:10.25236/FSST.2024.060605