

Utilization of Photoshop Images in Steam Education: The Perspectives of Rivers State Teachers

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Abstract

This study examined the perspective of teachers on utilization of Photoshop images in STEAM education in Rivers State. Two research questions and two hypotheses guided the study. Descriptive survey research design was adopted for this study. The population of the study was made up of 5,018 public school teachers in Rivers State. Quarter and purposive sampling was used to sample 358 teachers made up of 165 male and 193 female, 185 from urban schools while 173 were from rural schools. Self-developed questionnaire tagged Teachers' Utilization of Photoshop Image Inventory (TUPI) was used for data collection. The instrument was given face validation by two experts of Educational Technology and Measurement and Evaluation from Rivers State University and a reliability index of 0.77 was obtained using Kuder Richardson Formula (KR-21). Descriptive statistics were used to answer the questions while t-test was used to test the hypotheses. The findings revealed that teachers derive several benefits using Photoshop in lesson delivery. Therefore, the researcher recommends the training and retraining of teachers on Photoshop skills to enhanced teachers' skill in Photoshop.

Keywords: Photoshop, Steam education, Teachers Perceptions, Utilization

Introduction

Education is a tool in the hand of the general public for the emancipation of the entire social, cultural and economic lives of the society. To this end, effort has been made and shall continue to be made to improve on how education is spread among the populace for the sole purpose of getting more people engaged in training and improving the livelihood of the society. This process of training and improving the livelihood of the society, thus called for the use of technology and methods in the transfer of knowledge and attitudes needed to engender better skills, norms and cultural value system that is capable of changing the entire world and making it a best place for all mankind. The school system happened to be the best avenue so far developed for knowledge sharing and systematic training. This is because it is guided by principles, rules, and theories. Similarly, the rationale for the introduction of Science Technology Engineering Art and Mathematics (STEAM) in teaching and learning process was not far from the basic idea and purpose of education in general. Where teachers are obliged to transform people through adequate and well-defined content arranged based on the taxonomy of teaching

and programmed for the achievement of better education for all citizens.

The present age, where there is accelerated social changes, multiple and complex forms of communication tools for knowledge construction, draws the attention of educational institutions and bodies to innovations on the practices of teaching and learning. Because, social institutions such as universities are formed by principles and rules built on the dynamic teaching scheme which technological mediation plays a crucial role (Moreira, Elisondo & Melger, 2020). Innovation aids the shaping and reshaping of the school systems resulting in the integration of technology and use of multimedia in the classroom (Owolabi, & Oginni, 2013; Sharma, 2013). Additionally, the introduction of STEAM as an approach to integrate some subject areas for better teaching and expectedly better learning outcomes was another welcome development. The introduction of STEAM in the educational systems was aimed at combining the identified benefits of sciences and technology that are essential for adequate students' engagement in addressing global problems (Zhao, 2023). In this directions, working based on level of

relevance paved way at the international level to develop comprehensive talents in science, technology, engineering and mathematics (Yildirim, 2016). The bottom line is that the use of STEM and later STEAM by the introduction of arts in the wholistic approach to knowledge building and application is indeed targeted at achieving greater height in creativity, students continuous cross-disciplinary learning and application to practical situations (Irwanto & Ananda, 2024). It is believed that this approach shall be able to sustain students' cooperation through personal expression and interdisciplinary projects to enhance student engagement, creativity, innovation, and problem-solving (Root-Bernstein, 2015; Liao, 2016).

Some studies had acknowledged that in seeking better learning outcomes in STEAM education, actions are needed from preschool to basic education. Basic education gives very high rates of return in a Childs' development of individualized motivation and abilities that enhances their learning. (DeJarnette, 2018). The studies also emphasized the importance of early STEAM identity development at basic education level (Dou et al. 2019; Monkeviciene, Atukeviciene, et al., 2020; Hachey, 2020). The researchers on early childhood and basic education stressed the need for enriched innovative practices in learning that will create abilities in the children for greater creativity and productivity (Akman, Kentkurtcu, Tarman & Sali, 2017; Monkeviciene et al., 2020). It is believed that early interest in STEAM education will guarantee career choice and activities with STEAM areas (Torres-Crespo, Kraatz, & Pallanseh, 2014; Kermani & Aldemir, 2015; Park, Dimitrov, Patterson, & Park, 2017; Campbell Speldewinde, Howitt, & MacDonald 2018).

From the perspective of catching learners young and improving their interest through motivation, teachers must be innovative in the delivery of each lesson, creating high level of interaction between learners and the teacher and giving room for better activities that could engender capacity to inventions among learners which STEAM areas of study stands to achieve. These innovations starts from the points of lesson presentation where the teacher innovate instructional materials for the purpose of enhancing learning and imbibing interest in creativity and innovations. According to Mbaba and Atuzie (2024), innovative improvisation is a deliberate use of alternative materials/technology and resources to facilitate instructions when there is shortage of learning materials. This approach demands that teachers will

have all the necessary knowledge and expertise to deploy online resources and local resources and being able to apply appropriately to meet the learning needs of students. The need to engage learners with several innovative resources to enhance their learning outcomes have led to many studies, most of which support the use of divers technological skills in developing visual aids for classroom lessons (Panorama, 2020). The use of Photoshop as an innovative approach to providing or developing a resemblance of what teachers may be talking about in the classroom gives room for better understanding and better interaction, creativity and application of knowledge to problem situation.

Photoshop apps are developed many companies but most popular is Adobe Photoshop, it is the world's most advanced digital imaging software, used by photographers, designers, web professionals, and video professionals. The app gives users the utmost creative control for 2D and 3D image manipulation especially in video editing, and image analysis (Adobe, 2019). The term Photoshop simply means a workshop for images, it is a platform that enhances editing and amending the layers by way of isolation and monitoring of each layer from the other. Additionally, it's the ability to communicate and generate information and ideas through design. The Photoshop program is built on layers, which are often controlled independently (Mohammed, et al., 2021). On the other hand Horowitz, (2014) defined Photoshop as graphic design software that is used to edit images by photographers and graphic designers for promotional purposes in marketing applications. Photoshop is a known digital image editing software that is widely used, it is an excellent image processing software on the Windows platform in the recent time, Photoshop is great, having unlimited space for creativity, including color adjustment and special filters, which enable users complete the effect of synthesis (Dongfang, & Leizhen, 2021). There are programs and supplements for Photoshop to design complete websites, such as Illustrator, Corel Draw, Front page, Flash, 3D Max, Dreamweaver, and many auxiliary programs that help in producing a great work as a website (Mohammed, et al., 2021).

These attributes of Photoshop features makes it relevant in teaching in the classroom. In the 21st century, there shouldn't be any difficult contents that cannot be created with the use of appropriate app and technology. Thus, the use of Photoshop shall among others; produce appealing presentations, graphics and charts to better explain complex concepts in

understandable manner, design diagrams and other visuals aids to demonstrate scientific process, instructional events, or Mathematical principles, improve materials for interactive learning such as flashcards, quizzes, and puzzles to reinforce learning and make study engaging, incorporate digital story telling into language arts where students can use Photoshop to create manipulate images that accompany their narrations. And use Photoshop to enhanced STEAM education by visualizing scientific data, creating 3D models or designing electronic circuit diagrams through creative exercises (Moradi, n.d).

The use of Photoshop in several areas of marketing, arts and advertisement had provided numerous advantages to the users (Dongfang, & Leizhen, 2021; Horowitz, 2014). Yet, teachers have not absolutely taken a gripe of its usage in lesson delivery. Having the understanding that Photoshop gives room for the teacher to design and develop the image that suit the information intended to be illustrated in the classroom. Not only that it can be presented through online version but can also be printed in any size and presented as hardcopy for enhancing the illustration of difficult concept. It can be used to create an abstract object that can aids the teaching of a concepts. Hence, it is clear that the use of Photoshop have the potentials of improving creativity and innovations among teachers and learners especially in STEAM areas of education (Pi, Hong, et al., 2017; Moradi, n.d). But, it is not clear if teachers are using or are willing to use Photoshop images as instructional resources in their classroom. Moreover, if the use of Photoshop will enhance better learning activities and experiences among learners and teachers at the basic education level.

More so, the term gender expresses the characteristic of an individual to be male or female. This trait has significant role in how an individual learn or act (Mbaba, & Alikor). The challenge of proving whether gender have any influence on the use of technology in teaching and learning is unclear, hence the results of several studies on the use of technology have been inconsistent (Sharma, 2013). Additionally, in respect of urban and rural teachers, some research have proved that teachers from urban schools have high technology skill development than those in the rural schools (Mbaba, & Alikor). But with the use of Photoshop in classroom teaching and learning, there are no sufficient records to ascertain whether location (rural or urban) may influence teachers' perception of Photoshop in teaching and learning. These issues drive the need to evaluate the perceptions of basic education

teachers on the use of Photoshop in STEAM education in Rivers State.

Research Questions: this study is guided by the following questions;

1. What are the benefits of using Photoshop images in STEAM lesson delivery in Rivers State?
2. How effective is Photoshop images in classroom teaching?

Hypotheses

1. There is no significant difference in the perception of male and female teachers on the benefit of Photoshop images in lesson delivery.
2. There is no significant difference in the effectiveness of Photoshop images in classroom teaching and interactions between urban and rural schools.

Research Method

This study was carried out among teachers of basic education in Rivers state. Descriptive survey research design was adopted for the work. The population of basic education teachers in Rivers State was 5180. Krejcie and Morgan (1970) sampling table was used to arrive at 358 sample size. Quota and purposive sampling techniques were used to sample 358 teachers made up of 165 male and 193 female. 185 teachers were sampled from urban schools while 173 were from rural schools. Quota sampling was adopted to ensure all the characteristics such as gender and location across the state were adequately represented in the study. Purposive was used because only teachers who have used Photoshop or have knowledge of how it can be used were qualified to participate and were sampled for the study.

A self-designed questionnaire titled teachers utilization of Photoshop inventory (TUPI) was used for data collection. The instrument was a 5 point likert scale with the following options: Strongly Agree SA=5, Agree, A=4, Neutral N= 3, Disagree D=2, Strongly Disagree, SD=1. The instrument contains three section A-C. Section A was on demography while section B and C contains five items on the benefit of Photoshop in lesson delivery and effectiveness of Photoshop in classroom teaching respectively. The instrument was face validated by two experts of Educational Technology and Measurement and Evaluation from Rivers State University, Department of Educational Foundations. Reliability of

the instrument was done using twenty teachers and a reliability index of 0.77 was obtained using Kuder Richardson Formula (KR-21). Descriptive statistics

mean and standard deviation were used to answer research questions while t-test was used to test the hypotheses.

Results

Table 1: Mean ratings of teachers on the benefits of using Photoshop in lesson delivery in STEAM subjects in Rivers State

| S/N | Items | Mean | St.D | Remark |
|-------------------|--|------|------|--------|
| 1 | The integration of Photoshop resources in STEAM lesson delivery enhances students' performance | 3.00 | 1.39 | Agree |
| 2 | Students' understanding are enhanced in complex concepts through Photoshop resources. | 3.12 | 1.05 | Agree |
| 3 | Using Photoshop resources in lesson delivery improves teachers' effectiveness. | 3.01 | 1.24 | Agree |
| 4 | Photoshop help students' exhibit greater commitment and interest in classes' activities. | 3.07 | 1.14 | Agree |
| 5 | Teachers observed that the inclusion of Photoshop in STEM education may leads to greater dynamic innovative classroom environment. | 3.02 | 1.27 | Agree |
| Grand mean | | 3.05 | 0.87 | Agree |

The table above shows the mean ratings of teachers on the benefits of using Photoshop in lesson delivery in STEAM subjects in Rivers State. The respondents agreed that the integration of Photoshop resources in STEAM lesson delivery enhances students' performance (mean = 3.00, SD = 1.39), "Students' understanding are enhanced in complex concepts through Photoshop resources (Mean = 3.13, SD = 1.05), Using Photoshop resources in lesson delivery improves teachers effectiveness (Mean = 3.01,

SD = 1.24), Photoshop help students' exhibit greater commitment and interest in classes' activities (Mean = 3.07, SD = 1.14), and Teachers observed that the inclusion of Photoshop in STEM education may leads to greater dynamic innovative classroom environment (mean = 3.02, SD = 1.27). The grand mean value of 3.05 and standard deviation of 0.87 indicated that teachers observed several benefits from using Photoshop in lesson delivery in STEAM subject's area in Rivers State.

Table 2: Mean ratings of teachers on the effectiveness of Photoshop as it relates to teachers in the classroom.

| S/N | Items | Mean | St.D | Remark |
|-------------------|---|-------------|-------------|----------------|
| 1 | Teachers feel more confident in delivering STEM content with the aid of Photoshop. | 2.80 | 1.27 | Disagree |
| 2 | Photoshop create room for teachers to develop interactive and engaging lessons | 2.68 | 1.10 | Disagree |
| 3 | Teachers are willing to adopt Photoshop for effective lesson delivery in the classroom. | 4.69 | 0.78 | Strongly Agree |
| 4 | I believe that Photoshop is an effective tool for teaching STEAM subjects. | 3.11 | 0.82 | Agree |
| 5 | Teacher use Photoshop resources where necessary to enhances students' participation and collaboration in STEM activities effectively. | 4.47 | 1.01 | Strongly Agree |
| Grand mean | | 3.55 | 0.57 | Agree |

Table 2 shows the mean ratings of teachers on the effectiveness of Photoshop as it relates to teachers' willingness to adopt it in the classroom. From table 2 above, the respondents strongly indicated that "teachers are willing to adopt Photoshop for effective lesson delivery in the classroom (mean = 4.69, St.D = 0.78). They also indicated strongly that Teachers use Photoshop resources where necessary to enhances students' participation and collaboration in STEAM activities effectively (mean = 4.47, St.D = 1.01). Also, the respondents believed that Photoshop is an effective

tool for teaching STEAM subjects (mean = 3.11, St.D = 0.82). On the other hand, the disagreed that Teachers feel more confident in delivering STEM content with the aid of Photoshop (mean = 2.80, St.D = 1.27) and Photoshop create room for teachers to develop interactive and engaging lessons (2.68, St.D = 1.10). However, the grand mean value of 3.55 and standard deviation of 0.57 clearly shows that there is a high effectiveness of Photoshop in relation to teachers in the classroom.

Table 3: T-test result of the difference in the perception of male and female teachers on the benefit of Photoshop in lesson delivery

| Gender | N | Mean | Std. D | Df | t-test | Sign | Remark |
|--------|-----|------|--------|-----|--------|-------|--------|
| Male | 175 | 3.02 | 0.93 | 354 | -0.548 | 0.584 | NS |
| Female | 183 | 3.07 | 0.81 | | | | |

Table 3 shows the t-test result of the difference in the perception of male and female teachers on the benefit of Photoshop in lesson delivery. From the table, male teachers had (mean = 3.02, St.D = 0.93) while the female had (mean = 3.07, St.D = 0.81). The result show

354 degrees of freedom at t (-0.548) and significant value of 0.584. Since the significant value (-0.548) > 0.05, it means there is no significant difference in the perception of male and female teachers on the benefit

of Photoshop in lesson delivery. Hence, the null hypothesis one is accepted at 0.05 level of significance.

Table 4: T-test result of the difference in the perception of male and female teachers on the benefit of Photoshop in lesson delivery

| Location | N | Mean | Std. D | Df | t-test | Sign | Remark |
|----------|-----|------|--------|-----|--------|-------|--------|
| Urban | 175 | 3.49 | 0.56 | 356 | -1.804 | 0.072 | NS |
| Rural | 183 | 3.60 | 0.58 | | | | |

Table 4 shows the t-test result of the difference in the perception of male and female teachers on the benefit of Photoshop in lesson delivery. It shows that teachers from urban areas had (mean = 3.49, St.D = 0.56) while teachers from the rural areas had (mean = 3.60, St.D = 0.58). The result shows 356 degrees of freedom at t (-1.804) and significant value of 0.072. it can be observed from the table that the significant value (0.072) > 0.05. Therefore, null hypothesis two is accepted at 0.05 level of significance. Thus, there is no significant difference in teachers' perceptions between urban and rural schools in respect of the effectiveness and willingness of teachers to adopt Photoshop in lesson delivery.

Discussions of Findings

The data collected shows that teachers' perceptions agreed largely on the effectiveness and benefits of Photoshop images on students' classroom interactivity. It also indicates that the impact of Photoshop on teaching have aids teachers' willingness to utilization and inclusion of Photoshop images as part of the instructional materials available for teaching STEM in Rivers State. The study proved that Photoshop is able to influence students' classroom interaction and generate improved learning outcome. It was observed that the participants are teachers who have used or are currently using Photoshop app, hence they were very much aware of the benefits and effectiveness of Photoshop for both teachers and learners. This study is in consonance with Mohamed, et al., (2021) whose work identified significant impact of Photoshop on emotional intelligence among children of age 11-17. It is also in agreement with Monkeviciene, et al.,(2020) whose study examined the impact of innovative STEAM education practices on teacher professional development and 3-6 year children's competence development and find out that innovative approach in

STEAM indeed have positive impact on the development of competence among children.

Teachers' perceptions on the effectiveness of Photoshop in lesson delivery based on gender was not significant hence gender do not influenced their opinion. It can be observed that the use of technology or media in communication have no dependency on gender of who is using it. Hence, gender have no significant impact on the use of Photoshop in lesson delivery. This is in agreement with plethoric researches that agreed that gender do not influence teachers' perception on a number of issues including use of ASSURE model, technology in the classroom and multimedia in lesson delivery (Mbaba, & Alikor, 2024; Owolabi & Ogoni, 2013; Sharma, 2013). The location of teachers does not as well influence outcome of the results. Thus, there are no significant difference on the impact of Photoshop image on learners based on location. The implication of this fact is that Photoshop materials can be used anywhere and by everyone irrespective of location and gender.

Conclusion

This study examined the perceptions of teachers on a number of issues of Photoshop image development and use in lesson delivery. The study tested two hypotheses to ascertain the consistency of the perceptions in terms of gender, urban and rural areas. The findings shows that the inclusion of Photoshop as an instructional media in STEAM was welcomed. More so, there were challenges associated with the use of Photoshop in the classroom, the challenges were technical, skills, equipment and training. Therefore, the use of Photoshop in the schools particularly in STEAM education is bright, as some teachers are already using it. What is left for is the need to improve technology in schools and power supply to ensure efficiency of the provided equipment.

Recommendations

From the findings of this study a number of issues bordering on effectiveness of Photoshop images in lesson delivery, interactivity, and whole other challenges were observed therefore, the researcher made the following recommendations:

1. Head teachers should encourage teachers who are yet to apply Photoshop in their lesson delivery to employ such media in their lessons.
2. Schools should organize seminars and workshops for training and retraining of teachers to enhance teachers' Photoshop skills.

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