Journal of African Art Education
ISSN 2720-7714
Volume 1 Issue 3

VICTOR QUAYNORTEY-NYUMU TEYE
Department of Graphic Design
School of Creative Arts
University of Education, Winneba

Exploring the Benefits of Using Interactive Learning System in Teaching Basic Design in Winneba Senior High School.

How to cite:
Teye, V.Q.N. (2021). Exploring the benefits of using Interactive Learning System in Teaching Basic Design in Winneba Senior High School. *Journal of African Art Education,* 1 (3), 19-38.

Abstract

The study explored the benefits of using Interactive Learning System (ILS) in teaching Basic Design in Winneba Senior High School in the Central Region of Ghana. The perceived problem was that couple of teachers resort to textbook and chalkboard approach of teaching and learning which hinders better understanding. This was observed by the researcher in his regular visits to some of the schools. It is a common knowledge that when learners are taught without tangible teaching and learning materials, many a time, they have to imagine by trying to create mental pictures of what has been taught which may lead to distortions in their understanding. This informed the conduct of the study. Action research design constituted the research design for the study while census sampling technique was used to sample 70 respondents for the study. Simple descriptive statistics was used as the tool for data analysis. The study established that effective Interactive Learning Systems with multimedia component stored online and offline has the potential to facilitate easy understanding in learners in studying Basic Design in Senior High School.

Keywords

Interactive Learning Systems, Basic Design, Textbook and Chalkboard Approach

1.0 Introduction

In the teaching and learning of Basic Design, natural forms are used to explore design ideas in order to achieve desired designs. The structure of the natural forms, colour, texture, shape and other essentials are explored in designing (Barsukova, 2018). There are however, some problems that hinder the understanding of the concepts of basic design. When learners are taught without tangible teaching and learning materials, many a time, they have to imagine by trying to create mental pictures of what has been taught which may lead to distortions in their understanding (Teye, 2011). This is a limitation to the teaching and learning of basic design in some Ghanaian senior high schools.

A study conducted in one senior high school in the Central Region revealed that some Graphic design teachers teach in abstract (Teye, 2011). This makes understanding of the subject matter difficult. It creates problem for learners when what is being taught or learnt is only perceived through abstractions. Understanding abstract concepts requires the integration of information over a larger spatiotemporal window than understanding concrete concepts (Barsalou, 1999; Davis, Altmann, & Yee, 2019). Therefore, it is very indispensable that teachers introduce respondents to abstract concepts only after they have provided concrete illustrations to them. The advantages of working from the concrete to the abstract are twofold: respondents have an easier time conceptualizing abstraction from within a particular context, and such a context provides them with a greater motivation to do so (Lindsay, 2011).

The perceived problem for this study was that couple of teachers resort to textbook and chalkboard approach of teaching and learning in Ghanaian senior high schools. Ball and Feiman-Nemser (1988) conducted research on student-teachers to find out what they learned about textbooks in their pre-service training. This study, sheds light on how teachers use textbooks. It does so by describing what teachers are taught in teacher-training programmes about textbooks and how this knowledge affects their earliest experiences in the classroom. The importance of teaching and learning resources is further evidenced by today's textbooks that abound with dynamic visual material which is used to present between 40% and 50% of their content (Busljeta, 2013). With this as the background of teacher-trainees, it was not surprising to see some teachers teach using the textbook and chalkboard method in Ghanaian senior high schools.

However, many educational systems in developing countries are shifting to simple, effective and reliable approaches that enhance teaching and learning without compromising content knowledge of facts and principles. Yet the situation in Winneba senior high school does not reflect the growing trend in other educational institutions, where interactive learning systems are being deployed and used for teaching and learning. This study was therefore conducted with specific focus on exploring the benefits of using Interactive Learning System in teaching Basic Design in Winneba Senior High School.

2.0 What is an Interactive Learning System (ILS)?

An Interactive Learning System (ILS) is a programmed automated software designed to aid learning by dialogue or interaction between the user and the system being used. Interactive learning is a hands-on, real-world approach to education. According to Ghavifekr and Rosdy (2015), Interactive learning actively engages the respondents in working with the material they would use, and plays a very important role in the teaching and learning processes in and outside the classroom. ILS are designed to aid teaching and learning of any subject matter at all levels in academia. Some of the most common interactive learning systems currently employed in academic circles include and not limited to: skill workshops, case studies, master classes, press conferences, testing, learning through play, multimedia practical lectures and electronic study guides (Gulakova & Kharchenko, 2013). These interactive learning systems run online and sometimes on compact disc (CD) on a computer following relatively easy instructions. The structure and design of interactive learning systems gives it a lot of advantage over other means of knowledge sharing. According to Klarin (2000), Interactive learning systems are advantageous as they help to establish a friendly atmosphere among participants and have them connect with each other. Learning Systems with interactivity help boost learner self-reliance and self-assurance. It further creates an environment that allows the instructor to encourage learners towards working together. When using Interactive learning systems, it keeps everyone engaged in activity, assists low-achieving learners, and helps them make an active and continual use of the knowledge and experience gained earlier.

2.1 The benefits associated with the use of Interactive Learning Systems (ILS)

The use of ILS in schools can enable learners to be active in the teaching and learning process, and discover new knowledge. According to Teye (2011), the use of ICT in schools can enable learners to communicate, participate in lessons, and learn more effectively. It is every teacher's goal to improve lesson delivery by using well-tailored and learner-centered teaching strategies. Studies over the years have shown that interactive learning systems (using computer-based multimedia learning) takes less time, is more enjoyable and increases learning. According to Najjar (1996), learning was higher when information was presented via computer-based multimedia systems than traditional classroom lectures. Eastman, Iyer and Eastman's (2009) pilot study confirms Najjar's, (1996) view by stating that, 70% of respondents reported they improved their understanding of specific concepts they were taught using computer-based multimedia systems.

Interactive Learning System can benefit both teachers and learners in three areas: teaching and learning, research and service. The most stated goal of Interactive Learning System is to improve student learning in class attendance and student's preparedness, clearer comprehension, more active participation during class, increased peer or collaborative learning, better learning and higher retention and greater student satisfaction (Teye, 2011).

Another basic goal of all Interactive Learning Systems is to improve teaching effectiveness in at least two ways. With student response systems, immediate feedback is easily available from all respondents (not just the few extroverts in the class) on the pace, content, interest, and comprehension of discussion. This timely feedback allows the teacher to better judge whether and how to amplify, clarify, or review points. In addition, the teacher can also easily collect data on students' demographics, attitudes, or behaviours to better assess the group characteristics of student needs (Leask & Meadows, 2000).

Learners' active participation during lessons gives teachers the needed feedback to improve lesson delivery. A learner's participation and excitement in a lesson is manifested by the feedbacks they give a facilitator. Birdsall (2002) states that, obtaining feedback and ensuring respondents' participation in large classes are impossible without ILS system. Even in small classes, which can be made highly interactive without technology, this type of system ensures that all the learners think through questions, without leaving it to the vocal minority. Even in small-enrollment classes, many respondents are reluctant to respond to questions;

the anonymity of responding with an Interactive Learning System guarantees total participation by the entire class. Another study also reveals that 72% of respondents reported that they were more likely to participate in an interactive learning class (Eastman, Iyer & Eastman, 2009).

Peer or collaborative learning is one sure way to improve the performance of learners with challenges in class using their own colleagues as the conduit to help understand a taught concept. Birdsall (2002) opined that, interactive methods are great for getting learners started in thinking through the material, as well as getting them talking to each other about the material, which often leads to discussions that continue outside the class. According to Mazur (1997), a commonly recommended strategy is to allow learners to confer before submitting their answers. Learners can be encouraged to defend or explain their answers promoting further student discussion. Judson and Sawada (2002), opined that, when multimedia is used in teaching, learners understanding of concepts are advanced and misconceptions are unveiled. Woods and Chiu (2003, p.2), also agree to the fact that "If most of the class answer a question correctly, the learners answering incorrectly may be motivated to read or think more deeply about the subject matter". With ILS, students are always equally motivated and engaged purposefully.

Learners' satisfaction and better performance are achieved using ILS. In a review of four decades of literature, Judson and Sawada (2002) opined that, "leaners perform better when their lessons are taught using multimedia or instructional technology. They [student] attributed such factors as attentiveness and personal understanding to the use of ILS" (p.167). Judson and Sawada (2002) also conclude that "Polls from the 1960s through the late 1990s found that the use of ILS made respondents more likely to attend class, pressed them to think more, promoted them to listen more intently, and made them feel instructors know more about them as respondents" (p. 177).

Interactivity in the production of a learning systems is what joins the action between the learner, the learning system, and the learning material. Studies have established that interactivity has a strong positive effect on learning (Bosco, 1986; Cairncross & Mannion, 2001; Gupta, 2002; Hiroshi, 2002). A study by Najjar (1996), found that learning was higher when information was presented via computer-based multimedia systems than traditional classroom lectures. In another study, Bosco (1986) reviewed 75 learning studies and found that majority of the learners learn faster, and have better attitudes toward

learning when using interactive multimedia. Multimedia courseware on CD-ROM can be used to work on the desktop or at a learning center, at home, while travelling, or to enhance facilitated management development programme. Multimedia courseware can also be used on networks, Intranets or Internet. These distributed learning approaches allow for even more flexibility which in turn involves much lower quality images and will preclude the use of video.

Interactive learning systems are designed and developed using a modular approach. This approach makes each topic or section stand alone, so teachers or learners can delve deeply into the topic areas they need to learn, and skip over the ones they do not and come back to them later. In many cases, these learning systems include the options to customize the application for specific use where one can choose modules, and even edit the content in some fields (Bosco, 1986; Fletcher, 1989; 1990; Stafford, 1990). In order to reduce the costs and efforts needed to build multimedia contents, it is desirable to organize the content in a modular way so that it can be (re)used and created cooperatively (Ateyeh, Mülle & Lockemann, 2000). ILS can present true-to-life situations that learners face every day. Practical learners learn best when faced with real problems that have real consequences. Decision simulation, video simulations or simple animations allow learners to learn-by-viewing, learn-by-doing or learn-by-coaching. All are effective methods for developing practical skill and increasing information retention. All learners learn the same principles and skills. Computer-based courseware typically forces instructional designers to better organize and structure learning materials, and this alone can result in learning advantages.

Multimedia courseware may have higher up-front development costs, but studies have shown that it is less expensive and more effective than traditional classroom learning cost. The loss of productivity caused by sending learners away on field trips and other expenses are saved. The ability to practice new concepts in a risk-free environment improves learners' skills and ability. When using a built-in course management system like the ILS which collects and analyses learner delivery and performance data, substantial administrative time savings result.

3.0 Methodology

This study employed the action research design situated in the qualitative approach. The impetus for an action research is a perceived gap between what exists and what participants desire to see exist. In this sense, action researchers are change agents aiming to take a stand for a preferred future (Atiti, 2008)

and interested in resolving, reformulating or refining dilemmas, predicaments or puzzles in their daily lives through systematic planning, data-gathering, reflection and further informed action. Using the action research design was informed by the fact that the study involved participants in educational settings (Lesha, 2014). Besides, it focused on introducing an intervention in solving the identified problem about learners' use of ILS in the teaching and learning for better understanding. Action researchers focus more on relevance, social change, and validity tested in action by the most at-risk stakeholders; and is much more able to produce 'valid' results than ordinary or conventional social science involving expert research knowledge and local knowledges (Brydon-Miller, Greenwood & Maguire, 2003).

The accessible population for the study comprised all Form 1A and 1B totaling 68 visual arts respondents of Winneba Senior High School during the first term of the 2011/2012 academic year. All first-year visual art students were used for the study due to the manageable class size. Though the data was collected in 2012, for confirmability, current relevance and trustworthiness of the data, the researcher conducted focus group discussion and interview in 2020 for corroboration purposes. In the data collection phase in 2012 writing of class exercises and hands-on practical activities constituted the main instrumentation. Before the written class exercises, the researcher taught lessons using the 'textbook and chalkboard' way. The lesson took 90 minutes which is two periods in each class.

The instruments were used to help establish the weaknesses, if any, which informed the introduction of the interventions. The sampling technique used was census sampling since all participants of the accessible population was used as the sample. Simple descriptive statistics was used as the tool for data analysis. According to Kenton (2019), simple descriptive statistics, help describe and understand the features of a specific data set by giving short summaries about the sample and measures of the data.

Ethical considerations in research require that the dignity of respondents is respected (Fouka & Mantzorou, 2011). For this reason, the researcher sought approval from respondents before the commencement of data gathering by writing a letter to the headmaster of the school seeking permission to use Form 1 visual art students (as respondents) and the computer laboratory for this study. Respondents were assured of their anonymity, confidentiality and the fact that they (respondents) are free to opt out of the study as and when they feel threatened or uncomfortable during the study.

4.0 Results and Discussion

In the exploration of the effectiveness of using ILS in the teaching and learning process in relation to the perceived problem at hand, the results have been organized into three main phases for easy verification. These phases were pre-intervention, intervention and post-intervention exercises. The results are presented and discussed accordingly.

Table 1: Performances of the respondents in both classes at the pre-intervention stage.

Marks	Grade	Form 1A	Form 1B	Interpretation
80-100	A	0	0	Excellent
70-79	B	0	0	Very Good
60-69	C	4	2	Good
50-59	D	9	12	Fairly Good
40-49	E	14	18	Below Average
0-39	F	5	4	Fail

Source: Fieldwork (2012)

The total number of respondents in Form 1A was 32, and 36 in form 1B. Both classes were taught and assessed on the topic 'Elements of Design' by the pen and paper method of assessment. By the end of the lesson respondents were evaluated by giving them class exercise scored over 100%. Out of the total number of 32 respondents in Form 1A, no student had between the range of 79% and 100%. Four respondents had scores between the range of 60% - 69% being above average; nine respondents scored 50% - 59% which is average. A total of 14 and 5 respondents had between 40% - 49% and 0% - 39% respectively, representing below average.

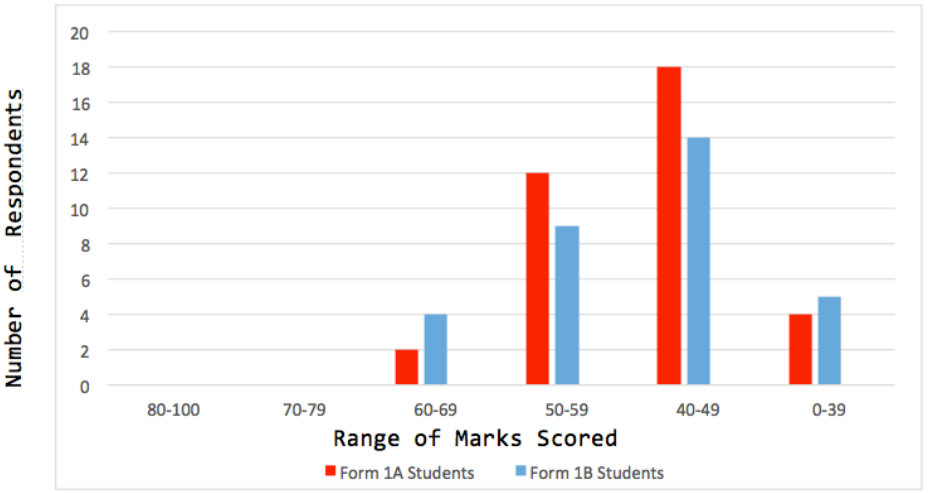

Figure 1: *A comparison of the Performance of Form 1A & 1B respondents in Pre-Intervention Results* **(Fieldwork, 2012).**

In Form 1B, a total of 36 respondents were in attendance that day. Here again, no student had between the range of 79 and 100%. Two had between the range of 60 - 69%, and twelve scored between 50% - 59% which is average. Fourteen (14), and 5 respondents had between 40% - 49%, and 0 - 39% respectively, representing below average. This indicates that 14 out of the total respondents representing 39% had an average score while the remaining 61% had below average. The performance put up by the respondents needed improvement in this instance for which reason the introduction of the intervention became necessary.

The researcher implemented the intervention by teaching one class (Form 1B) with the ILS Software. Preparations were made to use the ICT laboratory for the lesson. For this reason, the Interactive Learning System was installed onto all computers in the laboratory and the learners were allowed to operate within 45 minutes with the researcher as a facilitator. After students used the learning system (for example: after listening and watching videos footage of a dot as an element of design), respondents were allowed to make contributions or ask questions about that section before moving to the next level of the lesson. After going through all the elements of design using the ILS, the researcher evaluated the lesson by quizzing respondents. Table 2 shows the marks obtained by respondents after the intervention.

The intervention for Form 1A was a re-teaching of the lesson with the textbook and lecture method (with chalkboard demonstration). This was to enable the researcher compare the performances of respondents who were taught with the ILS and their colleagues who were taught with the textbook and lecture method.

Table 2: Pre-intervention and Post-intervention Test Results of Form 1A respondents.

Marks	Grade	Pre-Intervention	Post-Intervention	Interpretation
80-100	A	0	0	Excellent
70-79	B	0	4	Very Good
60-69	C	4	7	Good
50-59	D	9	12	Fairly Good
40-49	E	14	9	Below Average
0-39	F	5	0	Fail

Source: Fieldwork (2012)

From Table 2 above, no student had between 80% – 100% in both the pre – intervention and the post-intervention tests. Again, no student scored between 70% - 79% in the pre-intervention, but four scored between 70% - 79% in the post-intervention tests. Four of the respondents had 60-69% in the pre-intervention stage while seven of them had the same scored range. Table 2 also shows that nine (9) respondents in the pre-intervention and 12 respondents in the post-intervention had between 50% - 59% which is average performance. Fourteen scored 40% - 49%, representing below average, in the pre-intervention, and nine fell in the same range for the post-intervention. However, five (5) respondents had less than 0 - 39% in the pre-intervention, but none was in that range after the post-intervention.

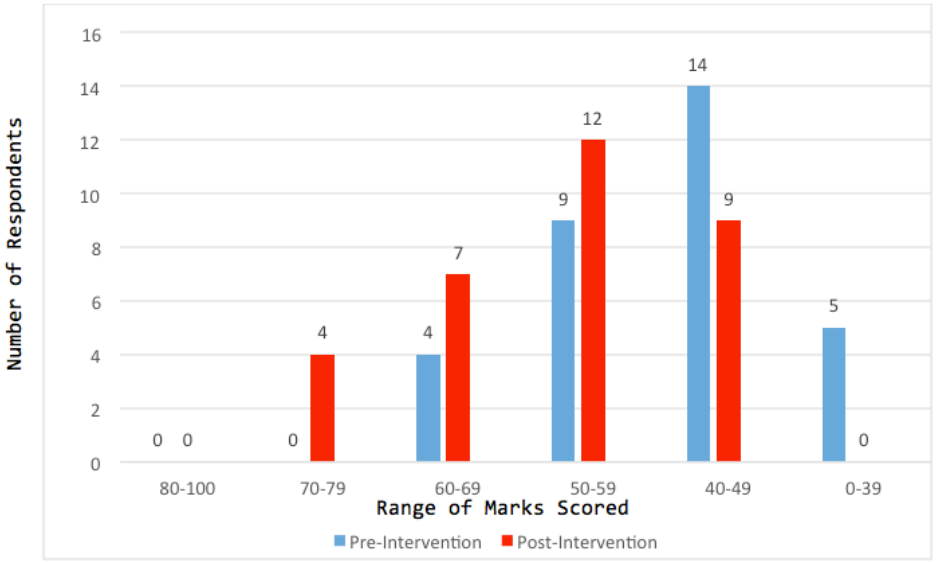

Figure 2: *A comparison of the Performance of Form 1A respondents in Pre and Post Intervention Results* **(Fieldwork, 2012).**

Table 3: Pre-intervention and Post-intervention Test Results of Form 1B respondents

Marks	Grade	Pre-Intervention	Post-Intervention	Interpretation
80-100	A	0	3	Excellent
70-79	B	0	9	Very Good
60-69	C	2	7	Good
50-59	D	12	7	Fairly Good
40-49	E	18	10	Below Average
0-39	F	4	0	Fail

Source: Fieldwork (2012)

From Table 3, no student had between 80% – 100% in the pre-intervention test, but Three students scored between 80 – 100% in the post-intervention. No student scored between 70-79% in the pre-intervention and Nine students scored between 70% - 79% in the post-intervention tests respectively, whiles two in the pre-intervention and seven respondents during the post-intervention had between 60% - 69%. The table also shows that 12 respondents in the pre-intervention and seven respondents in the post-intervention had between 50

- 59% respectively which is average. Eighteen and ten scored between 40 - 49% in the pre-intervention and post-intervention respectively, representing below average. Four respondents scored between 0 - 39% during the pre-intervention, but no student obtained a score less than 40% in the post- intervention test.

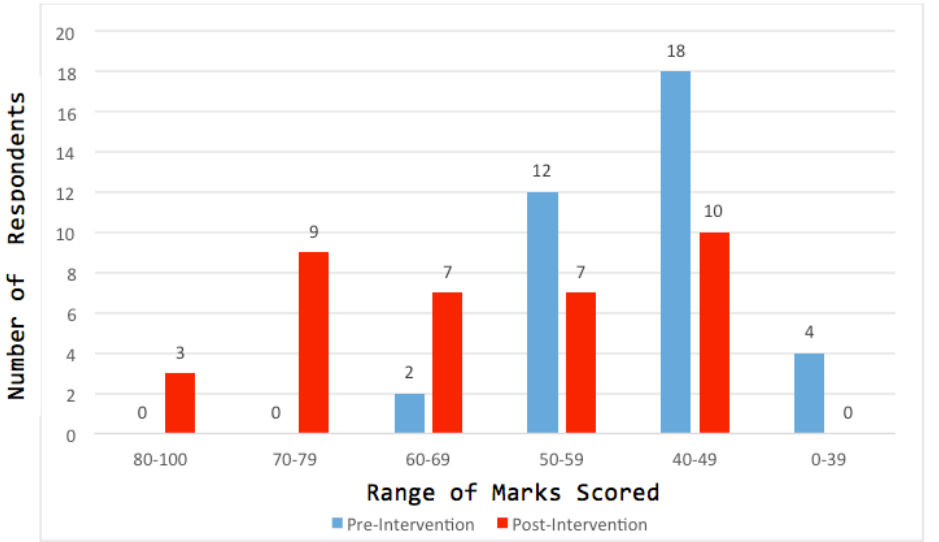

Figure 3 : *A comparison of pre- intervention and post-intervention results of Form 1B* **(Fieldwork, 2012).**

The result from the figure 3 indicates the performance of Form 1A during the pre-intervention and post-intervention stages. From the figure, the researcher observed that after the intervention, 11 respondents, representing 34.4% had improved upon their pre-intervention performance in the above average range 60 – 100%. Twelve respondents had also improved upon their pre-intervention performance in the average range 50 - 59%, representing 37.5%. Also the number of respondents in the below average range (0 - 49%) had fallen from 19 representing 59.4% to nine representing 28.1%.

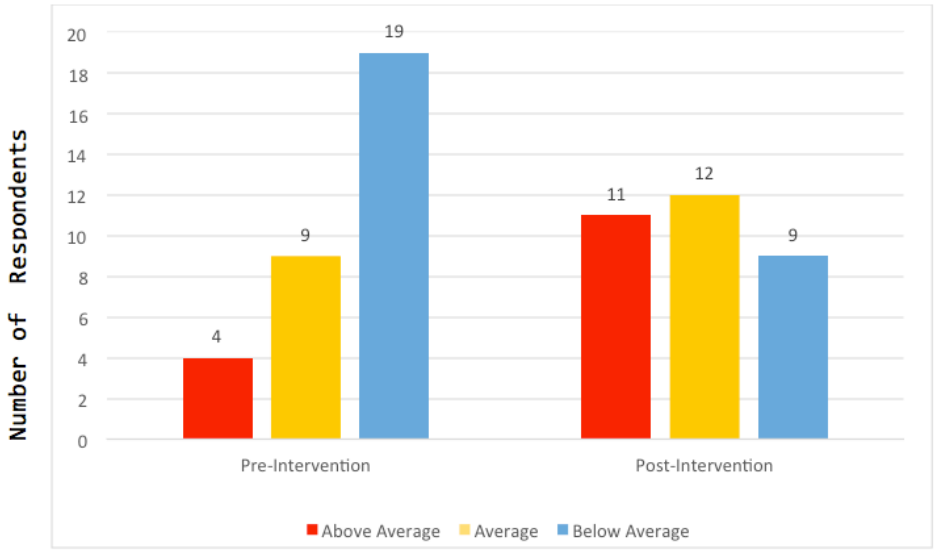

Figure 4: *A comparison of the performance of Form 1A respondents in Pre and Post Intervention Results* **(Fieldwork, 2012).**

The results show that there was some level of change in the results obtained from Form 1B. This class was taught with the ILS designed for the same lesson.

From Figure 4, it was revealed that 19 respondents, representing 52.8% had improved upon their pre-intervention performance in the above average range 60 – 100%. Seven (7) respondents had also improved upon their pre-intervention performance in the average range 50 - 59%, representing 19.4%. Also, the number of respondents in the below average range 0 - 49% had reduced from 22 representing 61.1% to Ten representing 27.8%

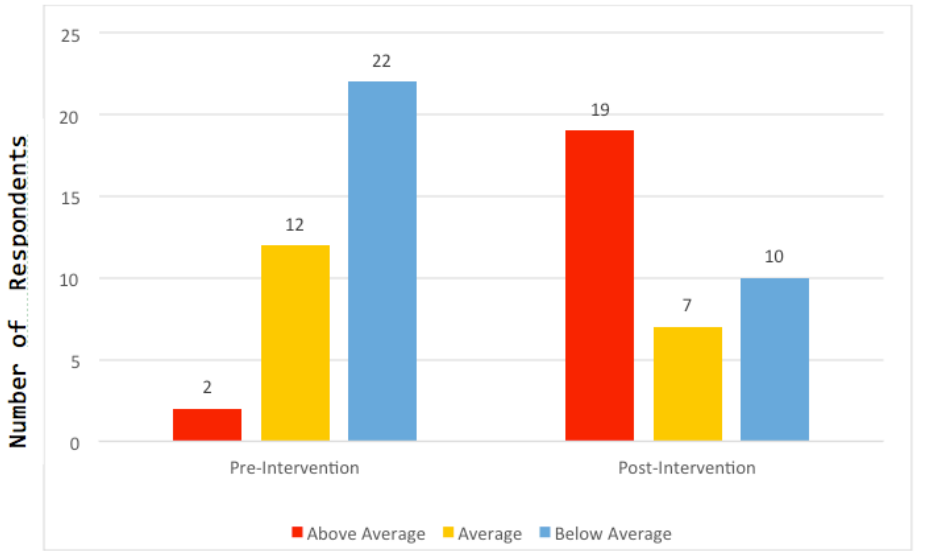

Figure 5: *A comparison of the performance of Form 1B respondents in Pre and Post Intervention Results* **(Fieldwork, 2012).**

In Form 1A, the researchers taught the "Basic Design" lesson by the lecture method of teaching, where lessons are delivered through talking, writing on a chalkboard to explain complex concepts and the results are shown above. The Pre – Intervention stage proved that, four respondents were above average, nine respondents in the average and 19 respondents below average. This result shows that there is the need for an intervention to arrest this problem.

To arrest the problem in Form 1A, a post – intervention lesson was taught using the same textbook and lecture method and the results was that, there has been improvement in respondents' performance. The number of respondents in the previous lesson who has average rose from four (4) to 11 respondents, the average score increased from nine to 12 and nineteen (19) reduced to nine (9) for the below average score.

In contrast, Form 1B was taught the same "Basic Design" lesson by the lecture method of teaching and the results are shown in Figure 5 above. In the pre – intervention stage that, two respondents were above average, 12 respondents in the average and 22 respondents below average. This result shows that there was a problem, which needs to be solved.

In solving the problem of Form 1B respondents, a post – intervention lesson was taught using the Interactive Learning System (ILS) and the results showed that respondents' performance improved immensely. This result is consistent with views of Leow and Neo (2014) who opine that 80.6% of respondents agreed that it is adequate to use multimedia in learning as their memory was improved. The respondents further stated that "...the animation and sound can attract me and I memorize better" which also indicates that the use of interactive learning systems significantly improves respondents' learning outcomes (p.6). Considering the standards for usefulness when using Interactive Learning Systems, students may consider the system more suitable if the content addresses the specific aim of their search, promotes their learning and research of the topic, offers animations or visuals to help students better comprehend and examine the information in the ILS environment (Geçer, 2014). The result also agreed with the position that interactive learning systems are very useful in enhancing the performance of learners (Al-Mousawi & Alsumait, 2012). This outcome suggests that when such interactive learning systems are deployed in schools, respondents' learning outcomes are likely to improve.

Out of 36 respondents in the class (1B), the post intervention-results indicate that 12 respondents progressed from below average range as compared to the pre – intervention results. A total of five respondents also progressed from the average range. Again, the results show that 17 respondents, representing 47.2% of the entire class progressed to above average from pre – intervention to post-intervention. The researcher observed from the results that the use of Interactive Learning System helps respondents improve upon their understanding and performance during evaluation of the Basic Design Elements. One of the students in Form 1B remarked 'The LMS has made me to understand the topic better. It is good you introduced it to the class.' Another said, "Sir, we would love to have more of this way of practical interaction with learning using offline. Even without the teacher, it is simple to understand.'

These remarks from the students underscored the fact that using ILS fostered students' active participation in the learning process, increased students' responsibility, gave them the opportunities for hands-on interaction with the learning system and engaged them in explicit direct instruction with the learning system.

5.0 Implication of the study

This study explored and exhibited the potency of interactive learning systems (ILS) in the teaching and learning of Basic Design in the Senior High School. It has also established with empirical evidence that teaching basic design concepts with ILS can improve learners' absorption capabilities to a higher rate compared with the chalkboard and textbook approach to teaching and learning the same lesson. Again, the study has adequately underscored the benefits of using ILS in the teaching and learning of basic design in senior high schools, and suggested that learners will better understand the concept of basic design when the teaching and learning processes are driven by an interactive learning system. This implies that in the teaching and learning of Basic Design in Senior High Schools, ILS facilitate students' learning, and therefore, an essential tool in that regard. ILS integration in art education as in the case of Basic Design is the way forward in this current dispensation.

6.0 Conclusions

Exploring the benefits of using Interactive Learning System in teaching Basic Design in the Senior High School gives both the teachers and learners a fair idea of how powerful the use of multimedia can be in a visual art classroom. In line with this, the study revealed that, using ILS provides a teacher with the power to share knowledge with ease. It is therefore concluded that lessons taught using Interactive Learning System are fairly easier and much more likely to be comprehended well by learners. This study recommends that teachers must be encouraged to used ILS for teaching their visual art lessons. There is also the need for teachers to offer professional development training course in the use of ILS so that they could include it in their pedagogy. This is to ensure easy assimilation and greater understanding of lessons. The Ghana Education Service should provide appropriate ILS for senior high schools. This is because when learners are taught using the appropriate teaching and learning tools, their class participation peaks.

References

Al-Mousawi, Z., & Alsumait, A. (2012). A digital storytelling tool for Arab children. *ACM International Conference Proceeding Series*. Retrieved from https://doi.org/10.1145/2428736.2428746

Ateyeh, K., Mülle, J., & Lockemann, P. C. (2000). Analysis of the development of collaborative didactic materials intended for e-learning - on the example of the development of the web portal of the Faculty of Teacher Education in Užice. *Proceedings of the Faculty of Teacher Education, Užice*. 8(1), 297-316

Atiti, A. (2008). *A critical action research on organisational learning and change for sustainability in Kenya*. (Ph.D. Thesis). Macquarie University, Sydney

Ball, D. L. & Feiman-Nemser, S. (1988). Using Textbooks and teacher's guides: A dilemma for beginning teachers and teacher educators. *Curriculum Inquiry,* 18(4), 401-423

Barsalou, L. W. (1999). Perceptual symbol systems. *Behavioral and Brain Sciences*, 22(4), 577–660. Retrieved from https://doi.org/10.1017/S0140525X99002149

Barsukova, N. (2018). The Process of Transformation Natural Forms into an Associative Design Model. *International Multi-Conference on Industrial Engineering and Modern Technologies*, 463(2), 22-44. Retrieved from https://doi.org/ 10.1088/1757-899X/463/2/022044

Brydon-Miller, M., Greenwood, D. & Maguire, P. (2003). Why action research? *Action Research,* 1(1) 9–28. 034201[1476-7503(200307)1:1]

Birdsall, S. (2002). Assessment and student response systems. *The Teaching Exchang*e. Retrieved from http://www.brown.edu/Administration/Sheridan_Center/pubs/teachingExchange/s ept2002/assessment.shtml.

Bosco, J. (1986). An analysis of evaluations of interactive video. *Educational Technology*, 26(5), 7-17. Retrieved from https://www.jstor.org/stable/44424638

Busljeta, R. (2013). Effective Use of Teaching and Learning Resources. *Czech-Polish Historical and Pedagogical Journa*l, 5(2), 55–69. Retrieved from doi: 10.2478/cphpj-2013-0014

Cairncross, S. & Mannion, M. (2001). Interactive multimedia and learning: Realizing the benefits. *Innovations in Education and Teaching International*, 38(2), 156-164.

Davis, C. P., Altmann, G. T. M., & Yee, E. (2019). Situational systematicity: A role for schema in understanding the differences between abstract and concrete concepts. *Cognitive Neuropsychology*. 71(1), 117-126, Retrieved from https://doi.org/10.1080/02643294.2019.1710124

Eastman, J. K., Iyer, R., & Eastman, K. L. (2009). Interactive technology in the classroom: an exploratory look at its use and effectiveness. *Contemporary Issues in Education Research. 2(3), 31-38.*

Fletcher, D. (1989). The effectiveness and cost of interactive videodisc instruction. *Machine-Mediated Learning*, 3(4), 361-385.

Fletcher, D. (1990). *The effectiveness and cost of interactive videodisc instruction in defense training and education*. Arlington, VA: Institute for Defense Analyses.

Fouka, G. & Mantzorou, M. (2011). What are the major ethical issues in conducting research? Is there a conflict between the research ethics and the nature of nursing? *Health Science Journal*, 5(1), 3-14.

Geçer, A. K. (2014). A study on information search and commitment strategies on web environment and internet usage self-efficacy beliefs of university students. *The Turkish Online Journal of Educational Technology,* 13(2), 1-17.

Ghavifekr, S., & Rosdy, W.A.W. (2015). Teaching and learning with technology: Effectiveness of ICT integration in schools. International Journal of Research in Education and Science (IJRES), 1(2), 175-191.

Gulakova, M. V., & Kharchenko, G. I. (2013). Interactive methods of learning in colleges as a pedagogical innovation. International Journal of Environmental & Science Education, 11(18), 12528-12539. Retrieved from https://files.eric.ed.gov/fulltext/EJ1124626.pdf

Gupta, A. (2002). Content development for e- learning in engineering education. *Interactive Educational Multimedia Journal*, 2(4), 12-23.

Hiroshi, H. (2002). Multi-level, interactive Web- based simulations to teach fluid mechanics and aerodynamics from middle school to college levels. *International Journal of Engineering Education,* 1(18), 1-6. Retrieved from https://doi.org/10.1046/j.0266-4909.2001.00204.x

Judson, E., & Sawada, D. (2002). Learning from the past and present: Electronic response system in college lecture halls. *Journal of computer in Mathematics and Science Teaching.* 21(2), 167-181

Kenton, W. (2019). *Descriptive statistics*. Retrieved from https://www.investopedia.com/terms/d/descriptive_statistics.asp

Klarin, M. V. (2000). Interactive learning: A tool for gaining new experience. *Pedagogy*, 7(1), 12–19.

Leask, M. & Meadows, J. (2000). *Learning to teach with ICT in the primary school*. (eds). London: Routledge

Leow, F. & Neo, M. (2014). Interactive multimedia learning: Innovating classroom education in a Malaysian University. *Turkish Online Journal of Educational Technology - TOJET*, 13(2), 99-110

Lesha, J.(2014). Action research in education. *European Scientific Journal*, 13.

https://paperity.org/p/59171555/action-research-in-education

Lindsay, P. (2011). Abstract teaching for a concrete world: A lesson from Plato. *PS - Political Science and Politics*, 44(3), 605 – 610. Retrieved from https://doi.org/10.1017/S1049096511000692

Mazur, E. (1997). *Peer instruction: A user's manual*. Upper Saddle River, NJ: Prentice- Hall

Najjar, L. J. (1996). The effects of multimedia and elaborative encoding on learning. *Georgia Institute of Technology*. Retrieved from http://www.cc.gatech.edu/gvu/reports.

Stafford, J. Y. (1990*). Effects of active learning with computer-assisted or interactive video instruction* (Unpublished doctoral dissertation). Wayne State University, Detroit.

Teye, V. Q. N. (2011). *Developing interactive learning system for teaching the elements of design in senior high schools*. (unpublished Master's Thesis). Kwame Nkrumah University of Science and Technology, Kumasi.

Woods, H. A. & Chiu, C. (2003) Wireless response technology in college classrooms. Retrieved from http://technologysource.org/article/wireless_response_technology_in_college_classrooms

About the author

Victor Quaynortey-Nyumu Teye teaches at the Department of Graphic Design and the Department of Art Education of the University of Education, Winneba. He holds PhD in Art and Culture. Developing online and offline learning management systemfor teaching and learning of art is his research interest.

Call for Papers

Journal of African Art Education (JAAE), the official journal of the Art Teachers' Association of Ghana, invites wide range of researches bordering on visual art education on the African continent. It attaches interest to researches that develop or deepen professionalism in art education in the African context. Topics include but not limited to instructional resources development, indigenous art education, assessment techniques, praxis of art education, aesthetics education, teaching and learning, art and development, art and environment, child art education, art and public education.

It is published quarterly online: August, November, February and May.

Send all inquiries about your article submission to:
atagonline.org@gmail.com
For more information on submission guidelines visit: https://www.atagonline.org/jaae/

Guidelines for Contributors

By submitting an article to the JAAE, authors must ensure that:

1. The submission has not been previously published, or has not been sent to another journal for consideration.
2. The manuscript follows the referencing style contained in the Publication Manual of the American Psychological Association (7th edition).
3. The submission file is in Microsoft Word document file format.

4. The text is double-spaced and uses a 12-point font of Times New Roman. It must use italics rather than bolding and underlining. All figures and tables must be placed within the appropriate part of the text.
5. The main manuscript should have no author names, except on the title page. The author should remove from the document properties and personal information by clicking on FILE, check for issues and Inspect Document (in MS Word) to leave any traces of their metadata in the manuscript.

JAAE Advisory Board's decision on each article is based on specific criteria. It is strongly recommended that you consider them before submitting your manuscript. It touches on:

Organisation/Quality of writing/Presentation style
Compliance with JAAE house style of presentation
Quality of writing/grammatical soundness
Clarity of thought/argument
Appropriateness of the article to the scope of the Journal
Soundness of Abstract (Does it summarise the key findings/approach of the article?)
Length of article (should not be more than 8000 words including abstract, keywords and references)
Appropriate use of APA guidelines in formatting of article

Significance and currency of the article
Soundness of problem statement
Use of relevant current literature
Suitability of theoretical/philosophical framework
Alignment of theoretical framework with research method

Materials & Methods
Appropriateness of research method (research design, sample and sampling technique, instrumentation, data analysis plan)
Ethical issues addressed

Soundness of analysis and interpretation; Conclusions/Recommendations
Clarity and depth of analysis and interpretation
Adequacy of interpretation and analysis
Soundness of conclusions and recommendations

Contribution to the knowledge & practice
Implication(s) to art education
Contribution to practice
Contribution to knowledge

JAAE welcomes manuscript at all times.
Submit to:
Submit Your Article to JAAE
atagonline.org@gmail.com