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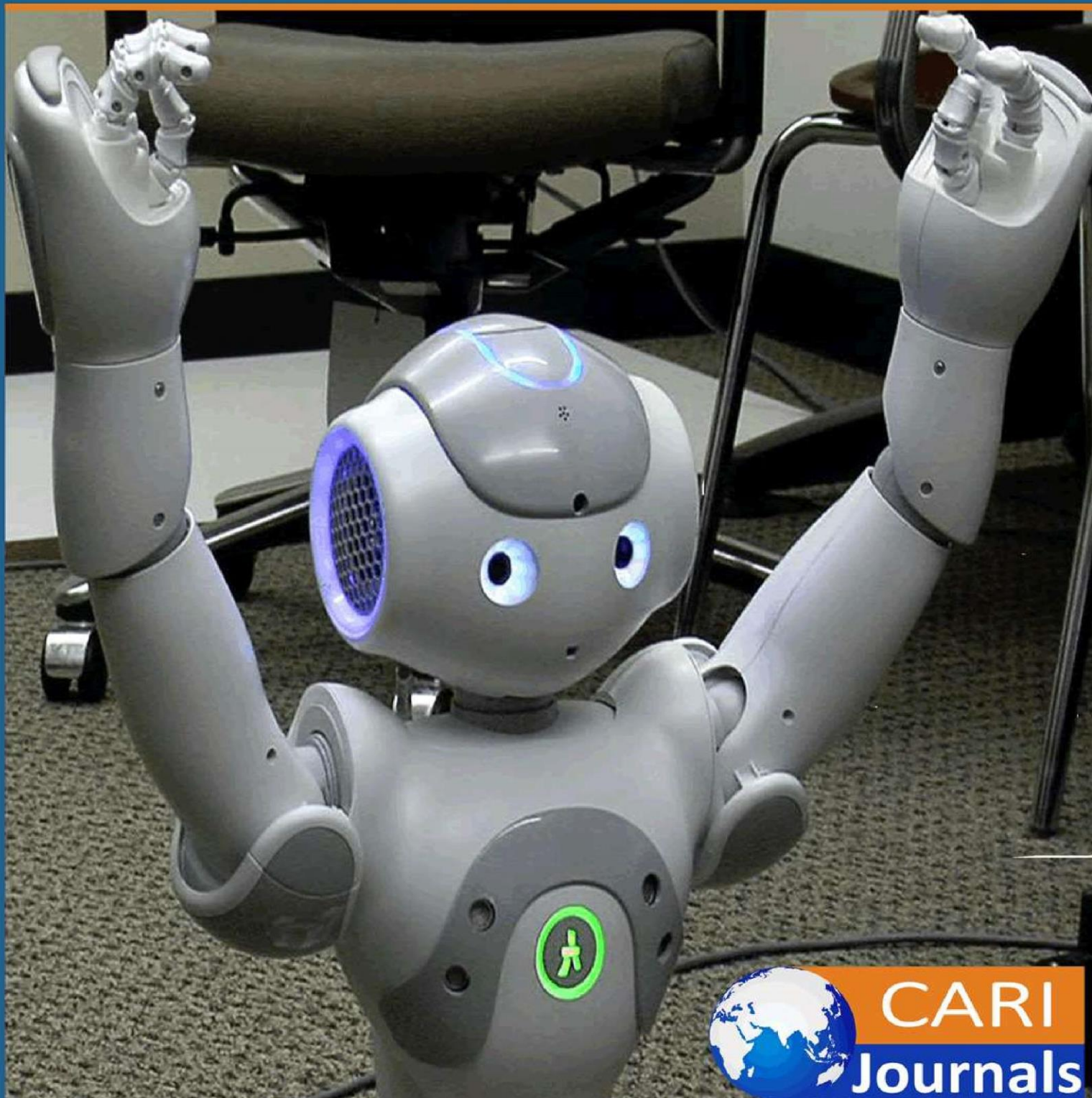

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Influence of Computer Aided Learning for Teacher and Students in Promoting Assimilation of Knowledge. A Critical Literature Review

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Abstract

Purpose: No matter how superior the techniques employed are, it's only through positive attitudes of teachers that the benefits of computer integration into the curriculum instruction could be realized. The overall objective of this study was to examine influence of computer aided learning for teacher and students in promoting assimilation of knowledge.

Methodology: The paper used a desk study review methodology where relevant empirical literature was reviewed to identify main themes and to extract knowledge gaps.

Findings: The study concluded that all the teachers and majority of the students (93.2%) disagreed to the statement that they had never used a computer and that they were not interested. Based on teachers' perceptions towards the use of computer aided learning all the teachers' strongly disagreed to the statement that computers scare them. Analysis of results showed that the teachers had a positive attitude towards computer aided learning. They therefore agreed that they believed computers were important teaching tool. The study also concluded that he school boards of management were partly involved in the training of teachers on computer aided learning and that the ministry of education also organized training courses for teachers on computer aided learning.

Unique Contribution to Theory, Policy and Practice: The study suggests that parents associations (PA) in schools should develop a PA fund and organize equipping schools with more computers and other computer aided learning resources in order to make teaching and learning using computer aided learning easier. The current study suggests that there is need to organize in-service training for teachers in order to equip them with expertise skills and knowledge and build their confidence with ICT tools.

Keywords: *Influence, Computer Aided, Learning, Teacher, Students, Promoting, Assimilation, Knowledge.*

INTRODUCTION

According to Odera (2011), attitude of teachers towards computers in education is a significant factor in the effective integration and use of computers in teaching and learning. Teachers have to accept the new technology. Furthermore, teachers' attitude about computers, she notes, can either positively or negatively influence the attitude of their students towards computer integration in teaching and learning. Factors such as lack of experience with use of computers, lack of interest and lack of support from school administration could make teachers develop a negative attitude towards computers. No matter how superior the techniques employed are, it's only through positive attitudes of teachers that the benefits of computer integration into the curriculum instruction could be realized. Artikson (2019) noted that teachers may fear being rendered irrelevant by the introduction of computers in their classes. They feel that if the learning process takes the student-centered approach, they may lose their authority in class, something that they really cherish. Obsolete computers can still be found in some schools very old computers some running on windows 98 or even Windows 95.

This lowers the morale of both the teacher and the student. Computers can also increase moral degradation whereby unsupervised students access internet pornography, cyber bullying and other anti-social behavior. This is an emerging problem which is worrying and affecting teachers' attitude towards computer integration in teaching and learning. Maina (2015) also found out that insufficient psychological preparedness has delayed perception change which has in turn hampered technology acceptance and usefulness in secondary schools. This has created fear of sustainability of ICT programmes. In Africa, the digital divide is really quite severe, going together with the other divides based on gender, racial, locality and poverty lines. Teachers are capable of playing a significant role in crossing this digital divide. Getting a computer is actually the first vital step as it provides access to technology. Then learning to use it bridges the divide further, as new skills are acquired. When the teachers cross this divide, they then will be able to lead students over the bridge (Jimoyians, (2022).

Efforts to integrate ICT in education in many countries have called for massive injection of funds into the education sector. This is upon realization that the world has become a global village due to the overwhelming changes in technology. This has led to changes in the labour market. In order to fit in this global village and meet this labour demands, the Kenyan education system is compelled to make certain changes in the curriculum content and most importantly in the delivery methods (Tanui, 2018). Stakeholders in the education system ought to understand and embrace the 21st Century skills within the framework of its academic standards. Learning institutions must also become accustomed to these changes and fully bridge the gap between how the students live and the way they learn (Nyaga, (2021).The challenge is to rise above traditional methods of teaching and change instructional practices in ways which mirror the changing social, political as well as economic setting in which 21st Century learner will be taught. Kenyans are now aware of the valuable role of technology in teaching as well as learning effectively. All the same the country

has not managed to make noteworthy progress in improving education by use of Computer Assisted Instruction.

Mwangi, Nchunge and Sakwa (2022) in their study User's Perception on ICT Adoption for Education Support in Schools: A survey of secondary school teachers in Thika District Kenya, recommended an increased investment strategy for improving the schools with ICT literacy facilities and resources for both teachers and students in Kenya. This is in a bid to address psychological as well as technical skill readiness for ICT integration. They also recommend that there is need for mass training and retraining of teachers on e-learning skills through computer training sessions, workshops and conferences. This training can impart the needed skills for teachers. Nyaga (2011) carried out a research comparing CAI and Conventional Instruction Techniques (CIT) in Science among Selected Secondary Schools in Embu District Kenya. He found out that majority of teachers and learners lack computer skills which is a demotivating factor. Lack of instructional programmes complicated matters further

Statement of the Problem

The computer is considered to be an influential learning resource and when used alongside the traditional instructional method it has positive effects on the teaching and learning process such as focusing on subject specific content, better critical thinking skills coupled with scientific enquiry. The reality on the ground is that the country still faces major challenges such as teachers' perception to change as well as anxiety about using computers which has in turn led to a resistance to use them. Many people who work in schools are also victims of TTWWADT-That's The Way we've Always Done Things. (Wamahiu, 2015). Majority of teachers also don't make real use of computers in instruction despite its numerous benefits. This study filled this gap to provide insight and information that could inform future interventions on influence of computer aided learning for teacher and students in promoting assimilation of knowledge.

Objective of the Study

The overall objective of this study was to examine influence of computer aided learning for teacher and students in promoting assimilation of knowledge. A critical literature review.

Significance of the Study

Tomorrow belongs for those who prepare for it today and since education is our passport to the future, use of computers in teaching and learning to a great extent prepares the students to achieve better grades and also help them enhance their learning rates. This study therefore is important as it will expose the challenges public secondary schools face in an effort to use computers. To begin with, it is particularly important to the students since addressing these challenges will help prepare them better for their careers tomorrow as they will be better prepared for achievements across various subject areas.

THEORETICAL REVIEW

This study will benefit from the 'ACTIONS' model proposed by Bates 1995.

This study was be guided by Bates' 1995 model on learning – The 'ACTIONS' Model. 'ACTIONS' stand for: A- Access: Refers to how a particular technology is accessible for learners. C-Costs: How much does each technology cost? T- Teaching and learning functions: Considers some of the best teaching applications for this technology. I- Interactivity and user friendliness: Is the technology easy to use? O- Organizational issues: Are there changes in organization that require to be made? N- Novelty: Is the technology the latest in the market? S – Speed: With what speed can courses be integrated with this technology? It's important to note that technologies ought to be adopted only if they contribute positively to students' learning.

Access Students and Staff Need to Access the Technology Adequately.

Provision of sufficient computers and network access is also necessary. It's also necessary to consider the various needs of learners and develop a policy to help students and staff feel at ease using proposed technology. The basic requirement for teachers as well as students in use of CAI is therefore a computer, digital content, plus access to the internet. There is need to consider the issue of access to the computer and the internet. Schools need to have enough computers to enable students and teachers to use CAI effectively. Where the computers are located in a school can have great impact on their utilization and acceptance by a school staff. One of the main considerations in deciding where to place computers should be ease of access. (Wango, 2021).

Costs

The cost connected with using CAI normally includes principal cost for buying the equipment. Operational costs together with instructional development costs, staff costs and cost of maintenance also need to be factored in. It is imperative to address how funds will be raised for sustenance of systems and services. The main recurrent cost elements which need to be considered are cost of internet connections; cost of maintaining the equipment and applications coupled with cost of replacement of equipment bearing in mind that a computer which is bought today has to be replaced in either three to four years' time. Allowances for ICT professionals must also be considered. According to Bates, (1995) cost is a strong discriminator between technologies and is normally the first issue considered by institutional decision makers. Differentiating between the costs of one – way and two – way technologies is therefore necessary. Generally, one – way technologies for instance print and audio have high initial production costs but on the other hand lower on- going costs while technologies that are two – way for instance conferencing which is computer based are relatively less expensive to set up but may have higher ongoing costs.

Teaching and Learning Functions

The use of technology is effective only when the user has a deep understanding of the subject as well as an imagination and idea of how best the subject can be taught using technology. There is

therefore need for a clear understanding of the advantages and weaknesses of different technologies used to support learning. In reality, the computer is just a tool-a very powerful multimedia tool-that can be used with any strategy the teacher may employ, from lecture presentation to individual work (Twoli, 2017).

Interaction and User Friendliness

It's imperative for the learners and learning materials, other learners and the teacher to interact for the learning process to go on. It's necessary that learning resources and activities are made as interactive as possible in order to achieve quality in teaching and learning. The degree and type of interaction differs to a great extent between technologies. Online conferencing generally encourages learner-learner exchanges and two-way learning while websites produced by simply repackaging the existing paper based-resources simply offer negligible interactivity and produce slight effect on learning outcomes.

Organizational Issues

The extent of support offered by the organization to a technology is a major determiner of its long-term success. Besides insufficient training, educators frequently note that lack of computer support prohibits their use of technology (Ivers, 2013). In order to ensure effective adoption of technologies it is necessary to consider additional staff development and training, changes in administrative structures and procedures together with improving technical support for staff and students. Eventually, schools will have to go through considerable structural adjustments to keep at the same pace with technological advances. A requirement of CAI will be that a number of organizational arrangements are made and barriers removed. It is also necessary to create awareness and change mindsets within the schools since lack of awareness goes along with mindset in that people get stuck to old ways of doing things. A means to addressing change of mindset is full involvement of teachers and students in the process of creating a CAI environment and benchmarking in schools where CAI has been implemented and the benefits can be seen. Educational organizations capable of exploiting the new technologies to help meet the needs of the twenty- first century are needed. (Bates, (1997).

Novelty

The newness of a technology may be an essential factor in attracting initial funding or obtaining new equipment. Students tend to react excitedly to the use of new technologies in instruction which may then lead to improved performance. This improvement is bound to be short lived unless the technology is able to deliver more effective learning in a sustainable and consistent way.

Speed

Teachers need to consider the time required for developing, updating and delivering educational resources, for instance consideration of delivery of text compared to that of video over the internet needs to be made.

Empirical Review

Maina (2020), conducted a study to assess the preparedness of academic libraries towards of adoption of cloud computing technologies so that academic libraries can have clear path on how to prepare and measures to put towards cloud computing adoption. The study was undertaken at Jomo Kenyatta University of Agriculture and Technology library, Kiambu County, Kenya where 40 librarians were involved in the study. Random sampling procedure was used to select the sample population. The study used descriptive study design to carry out research. The results from the study showed that the library was experiencing shortage in infrastructure due to low student to computer ration, low bandwidth, only one OPAC point and centralized servers. Most library staff posed basic ICT skills with just few staff being experts in areas where cloud computing skills are required. The study recommends that the government and the university should concentrate on ways of making cloud computing affordable by budgeting more funds to improve the ICT infrastructure in the library. The library should concentrate on impacting the library with skills; invest more to improve the ICT infrastructure in the library. The study used descriptive research design presenting a methodological gap as our study will use desktop review design.

Barihm (2019), conducted a study to investigate Senior High Schools students' perception of CAI as tools for teaching and learning, and whether gender and school location influence students' adoption of CAI during learning of Social Studies. The quantitative research design was adopted for the study. The data for the research was collected from 3 Junior High Schools randomly sampled from the North East Region of Ghana using Slovin's formula for sample size determination. The study found that students' perception of CAI was positive, however, their application of technology in learning was limited. Also, male students were using technology to learn than female students. There was no statistically significant difference between rural and urban students' integration of CAI in learning. The study recommends the supply of schools with relevant digital infrastructure, training, and supply of laptops to female students, and allowing Senior High Schools students to use phones in schools purposely for learning to increase students' performance. The study presented a geographical gap as it was conducted in Ghana while our study will be a global study.

Ondu (2018), conducted a study that entailed the analysis of computer metaphors in terms of the target and source domains; identification and analysis of computer metaphors that were successful and those that were unsuccessful in relating to the real life language use, and finally the identification of cases of misinterpretation of expressions used in computers. The findings showed that there were a number of metaphors which were successful and those which were not successful in relation to how the concepts were close to the words in real language use or not. The Port, Plug and Play, Host and Repeater metaphors were classified as unsuccessful while the rest were successful. The researcher during the analysis, noted that there were cases of misinterpretations of expressions. These misinterpretations lead to lots of confusion amongst users if they do not relate the concepts at hand to the contexts in which they are used. The study presented a conceptual gap

as it focused on analysis of computer metaphors in terms of the target and source domains while our study will focus on influence of computer aided learning for teacher and students in promoting assimilation of knowledge.

Usman (2018), conducted a study to investigate the perceived need for adopting cloud computing in academic libraries of Kaduna State; to explore librarians' perceptions of cloud computing in the academic libraries of Kaduna State; to evaluate the extent of use of cloud computing in academic libraries of Kaduna state and to identify the challenges of the adoption of cloud computing in academic libraries of Kaduna State. Descriptive and inferential statistics methods will be used for data analysis and presentation of results. The key findings from the study were that librarian have adopted cloud computing based specific need attached to their institutional mission and vision, that the benefits derived prompted the need to accept the technology and they believe it can provide a solution to a number of challenges facing their academic libraries. The study also found out that the major bottlenecks were the issue of trust between cloud service providers and consumers which ranges from data integrity, data ownership, data privacy and absence of legislation that guide and guard deployment of cloud. The study concluded that these challenges have significantly influence their level of acceptance. The study used descriptive and inferential research design presenting a methodological gap as our study will use desktop review design

David (2015), conducted a study aimed at finding out the state of copyright law implementation in libraries in Kenya with specific reference to reproduction of informational materials. The study aimed at specifically establishing the rules, regulations and procedures of reproduction of informational materials used in the libraries. The survey also aimed at finding out the level of copyright law awareness by the library staff and library users and the methods used in creating the awareness. The other objective of the survey was to establish the views of librarians and publishers on Copyright Law in Kenya and its application in libraries. The study revealed that the rules, regulations and procedures of copying in libraries are not, clear. It was also found out that the copyright law is inadequate and does not meet the needs of the libraries. The copyright law awareness among the library users and library staff was found to be low. The study presented a methodological gap as it was a survey while our study will utilize desktop review approach.

Mwanda (2015), conducted a study to determine the extent to which secondary schools in Rachuonyo South Sub-County were equipped with Computers. Findings of the study revealed the most schools in the Sub-County had few computers, most of which were in computer labs and offices. Biology teachers of Rachuonyo South Sub-County generally have positive attitude towards use of computer technology for instruction purposes. The study presented a conceptual gap as it focused on determining the extent to which secondary schools in Rachuonyo South Sub-County were equipped with computers while our study will focus on influence of computer aided learning for teacher and students in promoting assimilation of knowledge.

METHODOLOGY

The study adopted a desktop literature review method (desk study). This involved an in-depth review of studies related to influence of computer aided learning for teacher and students in promoting assimilation of knowledge. Three sorting stages were implemented on the subject under study in order to determine the viability of the subject for research. This is the first stage that comprised the initial identification of all articles that were based on influence of computer aided learning for teacher and students in promoting assimilation of knowledge. The search was done generally by searching the articles in the article title, abstract, keywords. A second search involved fully available publications on the subject on influence of computer aided learning for teacher and students in promoting assimilation of knowledge. The third step involved the selection of fully accessible publications. Reduction of the literature to only fully accessible publications yielded specificity and allowed the researcher to focus on the articles that related to influence of computer aided learning for teacher and students in promoting assimilation of knowledge which was split into top key words. After an in- depth search into the top key words (influence, computer aided, learning, teacher, students, promoting, assimilation, knowledge), the researcher arrived at 6 articles that were suitable for analysis. This were findings from:

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SUMMARY, CONCLUSION AND RECOMMENDATIONS

Conclusion

The study concluded that all the teachers and majority of the students (93.2%) disagreed to the statement that they had never used a computer and that they were not interested. Based on teachers' perceptions towards the use of computer aided learning all the teachers strongly disagreed to the statement that computers scare them. Analysis of results showed that the teachers had a positive attitude towards computer aided learning. They therefore agreed that they believed computers were important teaching tool. The study also concluded that he school boards of management were partly involved in the training of teachers on computer aided learning and that the ministry of education also organized training courses for teachers on computer aided learning.

Recommendations

The study suggests that parents' associations (PA) in schools should develop a PA fund and organize equipping schools with more computers and other computer aided learning resources in order to make teaching and learning using computer aided learning easier. The current study suggests that there is need to organize in-service training for teachers in order to equip them with expertise skills and knowledge and build their confidence with ICT tools.

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