

## **Effect Of Audio-Visual Intervention and Cooperative Learning on Keyboard Mastery in Computer Studies Among Junior School Students in Ede, Osun State**

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### **Abstract**

This study examined the effect of audio-visual intervention and cooperative learning on keyboard mastery in computer studies among junior school students in Ede, Osun State. Three, hypotheses guided the study, and a 3x3 factorial quasi-experimental design was adopted which involved pre-test, post-test, non-randomized control and non-equivalent intact groups. The population for the study was all the students in Government Junior Secondary School Two in Ede South Local Government Area, Osun State, Nigeria, which at the time of this study was 965. The sample for the study was 261 from three intact classes; two experimental classes and one control class. Research Instruments consisted of: (i) computer keyboard mastery (CKM), (ii) Video Tutorials, (iii) Interactive Keyboard Simulator (iv) Typing Games and (v) a lesson plan structure provided to facilitate the teaching of computer keyboard mastery. The Computer Keyboard Mastery (CKM) was validated and pilot tested for reliability using Kuder Richardson 20 (KR-20) formula with a result of 0.75 value. Using ANCOVA to test the hypotheses generated for the study, the results revealed that there is a significant main effect of audio-visual intervention on Junior Secondary School Students' Keyboard mastery level in computer studies in Ede, Osun State ( $F_{(1,177)} = 1137.406, p < 0.05, \eta^2 = 0.865$ ). A significant main effect of cooperative learning exists on Junior Secondary School Students' Keyboard mastery level in computer studies in Ede, Osun State ( $F_{(1,180)} = 1124.769, p < 0.05, \eta^2 = 0.862$ ). There is a significant interactive effect of audio-visual and

cooperative learning intervention on Junior Secondary School Students' Keyboard mastery level in computer studies in Ede, Osun State ( $F_{(1,128)} = 0.057$ ,  $p < 0.05$ ,  $\eta^2 = 0.830$ ). It was recommended that: (i) audio-visual intervention and (ii) cooperative learning should be adopted independently and (iii) in combination of both audio-visual intervention and cooperative learning should be adopted in teaching and learning of computer keyboard mastery at the Junior Secondary Schools for effectiveness.

*Keywords:* Audio-Visual Intervention, Cooperative Learning, Keyboard Mastery, Computer Studies, Junior School Students

### **Introduction**

The incorporation of technology into the field of education has gained significant prominence in recent times. The acquisition of computer keyboard skills is a crucial element of this integration, as it plays a vital role in facilitating students' academic achievements and future professional prospects. Scholars have been investigating the efficacy of audio-visual treatments and the use of cooperative learning approach in improving computer keyboard skills among students in Junior Secondary School because the importance of keyboard skills in the digital age has become a fundamental literacy requirement. Recent studies have emphasized the role of keyboarding mastery in enhancing information processing and academic performance, making it crucial for students to acquire these skills early (Juliana, Jacquilin & Benedeth, 2019). Mastery in computer

keyboard usage is not solely a technical aptitude; rather, it serves as a conduit to enhance the efficacy of information processing, communication, and problem-solving. Intervention studies offer a distinct chance to explore the cognitive flexibility and adaptability exhibited by Junior Secondary School students, who are at a developmental stage characterized by these attributes.

Mastery in keyboard abilities is an essential component of computer studies, offering students a tangible means to explore the digital realm. Educators are currently investigating novel pedagogical ways that beyond conventional methods, acknowledging the importance of this particular skill. Mastering the computer keyboard is a fundamental skill in today's digital age, essential for efficient communication, productivity, and navigation

through various software and applications. Firstly, understanding the layout and functionality of the keyboard is crucial. Modern keyboards typically follow the QWERTY layout, named after the first six letters on the top row. This layout has become the standard across most countries, but variations exist. Becoming familiar with the layout and the positions of special keys such as the function keys (F1-F12), navigation keys (arrows, Home, End, Page Up, Page Down), and modifier keys (Shift, Ctrl, Alt, Command) is key to efficient operation (Anne & Russell, 2022).

Speed and accuracy are paramount in mastering the keyboard. Touch typing, where the typist uses muscle memory to type without looking at the keys, is a skill worth developing. Practice and repetition are essential to build typing speed and accuracy. Many online resources and software programs offer typing tutorials and exercises to help users improve their skills. Additionally, techniques such as proper hand placement and posture can enhance typing efficiency and reduce the risk of repetitive strain injuries. customizing keyboard shortcuts and macros can significantly enhance productivity (Donica, 2019). Most

software applications allow users to create custom keyboard shortcuts for frequently used commands, functions, or macros. Learning these shortcuts and incorporating them into one's workflow can save considerable time and effort. Furthermore, specialized keyboards with programmable keys or software utilities that allow customization can further streamline tasks by automating repetitive actions (Donica, 2019). For junior school students, mastering the computer keyboard can be both challenging and rewarding. One primary difficulty they face is the sheer complexity of the keyboard layout itself. The arrangement of letters, numbers, symbols, and function keys can be overwhelming at first. For many young learners, this may be their first exposure to typing on a full-sized keyboard, and understanding where each key is located requires time and patience. Additionally, the size of the keys and the spacing between them can pose challenges for smaller hands, leading to mistyped characters and frustration. Another obstacle junior school students encounter is developing proper typing technique. Touch typing, the method of typing without looking at the keyboard, is an essential skill to learn for efficiency and

accuracy. However, mastering this technique can be daunting for beginners. Junior students may struggle with hand positioning, finger placement, and maintaining consistent rhythm while typing. Moreover, the concept of using muscle memory to remember key locations may not come naturally to them, requiring repetitive practice and reinforcement (Abdulmumini, 2022).

Furthermore, junior school students may face difficulties in typing speed and accuracy. Typing requires coordination between hand movements and visual processing to locate and press the correct keys. For young learners who are still developing fine motor skills and hand-eye coordination, achieving proficient typing speed can be a gradual process. Making mistakes while typing and needing to correct them can slow down the learning curve and lead to frustration, especially when students are under pressure to complete assignments or tasks within time constraints. Additionally, distractions can impede junior school students' progress in mastering the computer keyboard. In a classroom setting or home environment, there may be various stimuli competing for their attention, such as noise, movement, or digital devices. Staying focused on practicing typing skills amidst

these distractions can be challenging for young learners. Moreover, the allure of alternative forms of entertainment, such as games or social media, may divert their attention away from typing practice, hindering their progress (Abdulmumini, 2022).

Also, lack of access to appropriate resources, guidance, instructional strategies and methods of teaching can hinder junior school students' efforts to master the computer keyboard. Schools may have limited access to typing software or online tutorials, making it difficult for students to practice outside of structured lessons. Additionally, not all educators may have the expertise or time to provide individualized support and feedback to students as they learn to type. Lack of consistent practice opportunities and feedback can slow down students' progress and hinder their ability to develop proficiency in keyboarding skills (Myeonggon & Hong, 2019).

Audio-visual interventions use interactive multimedia components, harnessing the potency of visual and audio cues to augment understanding and memory. The utilization of audio-visual means as a medium for accessing information is a valuable

opportunity provided by the skills of information and message delivery. This medium has gained considerable influence and can be effectively employed as a tool for achieving good educational outcomes and facilitating the learning process. As there is a growing recognition that the conventional method of teaching through lecturing and using chalkboards is insufficient to meet the changing demands of the educational and learning process, there is a rising trend in the utilization of instructional resources and cooperative learning approach as a means to complement traditional classroom training. This collection of educational materials facilitates a learning environment that is self-directed, learner-controlled, and tailored to the individual student's needs (Johnson, 2019).

Audio-visual refers to a comprehensive interactive application or presentation that employs diverse digital media formats, such as text, images, audio, and video, to effectively convey messages or information to a targeted audience. Consequently, the incorporation of visual aids such as pictures and animations facilitate the communication and comprehension of ideas, thereby enhancing the overall educational

experience. There is a belief that the engagement of several senses throughout the learning process leads to the acquisition of a greater amount of information<sup>2</sup>. Furthermore, it is argued that this active involvement facilitates retention and recall by stimulating social, expressive, and knowing cognitive processes. As a result, the overall learning experience becomes more successful; also, the advent of the computer facilitated the integration of animation with audio-visual aids, hence enabling enhanced visualization capabilities (Johnson, 2019).

Also, in the realm of education, there is a pressing need for educators to confront the difficulties associated with effectively engaging individuals who have grown up in the digital age. For instance, educators may find it challenging to maintain students' engagement during extended lectures, as digital natives may be more inclined towards interactive and dynamic learning experiences. In contrast, incorporating technologies like interactive simulations, educational games, or multimedia presentations aligns more closely with the preferences of digital-age learners. These methods not only cater to their accustomed modes of information consumption but also

enhance the overall learning experience by making it more interactive and engaging (Agada & Sam-kayode, 2022).

Consequently, it becomes crucial to gain a comprehensive grasp of the efficacy of cooperative learning. In the current period characterized by rapid development of classroom dynamics, it is possible that conventional teaching approaches may prove inadequate in effectively engaging and motivating students in mastering the use of computer keyboard. Cooperative learning involve facilitates the establishment of a collaborative learning milieu, wherein students have the opportunity to acquire knowledge from their peers' diverse experiences, perspectives, and errors. In the realm of education, audio-visual interventions are utilized to harness the potential of multimedia resources in order to construct learning experiences that are both interactive and captivating (Agada& Sam-kayode, 2022).

In contrast, under a cooperative learning environment, students collaborate in order to collectively achieve group objectives, as opposed to pursuing individual or competing endeavors. Students engage in collaborative discourse, actively participate in knowledge

exchange, and offer support and motivation to fellow group members. Cooperative learning encompasses several essential components. Firstly, positive interdependence is crucial, as it necessitates that each student recognizes their significant contribution to the group's success. Secondly, individual accountability is essential, requiring every student within the group to take responsibility for comprehending the instructional material presented. Additionally, group rewards serve as effective incentives for fostering collaboration and encouraging collective effort. Lastly, group training is indispensable, as students cannot be expected to cooperate seamlessly without being explicitly taught the necessary social skills for effective collaboration (Alcalá, Garijo, Vállora, Juan, Vicedo & Extremera, 2020).

In the past, students assumed a passive role as listeners in educational settings. However, with the advent of contemporary education, teaching and learning have undergone a transformation. Presently, instructional processes are enhanced by the utilization of audio-visual materials, which have gained significant popularity and currently constitute approximately eighty- five (85)

percent of total instructional time. The user's text is incomplete and does not provide enough information to be rewritten in an academic form. Audio-visual instructional materials and the use of cooperative learning have the capacity to effectively engage learners, enhance the entertainment value of sessions, and leave a lasting impact on both students and instructors (Ibemenji, Sunday & Chijioke, 2019).

Furthermore, in the twenty-first century, students are categorized into virtual groups, and the utilization of audio-visual instructional resources and cooperative learning holds significant importance in contemporary education. They are commonly known as "teaching strategies or teaching approaches and they include various facilities and resources employed by educators to demonstrate, elucidate, and reinforce abilities during the instructional process. The utilization of the computer keyboard in the process of mastering it enhances the learning experience by simplifying the learning process, increasing engagement, providing a tangible learning tool, enhancing the overall pleasantness of the learning experience, and simultaneously introducing a level of difficulty. There is a pressing need for

enhancements in educational quality in order to bridge the gap between advanced and developing nations. Material resources are typically considered a crucial tool in achieving this objective.

However, the sheer presence of cooperative learning in a school does not guarantee significant improvements in student behavior. The incorporation of cooperative learning in the learning environment necessitates the presence of a teacher as a crucial element throughout the instructional process. Many students are unable to fully utilize the potential benefits of cooperative learning in the absence of teacher involvement. It is imperative for educators to adopt an active role when utilizing audio-visual technology. In order to foster critical thinking and creativity among students, it is imperative that educators possess a comprehensive understanding of cooperative learning and audio-visual resources and their effective integration within classroom settings. Teachers should acquire the skills necessary to support and motivate students in their learning process by empowering them to take ownership of their education. A significant number of present-day alumni have been seen to exhibit deficiencies in



various areas, including creativity, communication skills, logical and critical thinking, and problem-solving capabilities, among others (Adriana & Kudosz, 2023).

Researchers have utilized a range of cooperative learning and audio-visual interventions, including peer to peer teaching and interactive software and multimedia lessons, to effectively involve students in the acquisition of keyboard skills. The primary objective of these treatments is to establish a learning environment that is both engaging and pleasurable. Moreover, current research indicates that the use of cooperative learning audio-visual treatments has been shown to facilitate the development of cognitive abilities associated with the acquisition of keyboard mastery among students. The incorporation of cooperative learning, visual and aural cues has been found to have a positive impact on memory recall and motor abilities, hence facilitating improved typing efficiency among students (Aydin & Balim, 2020). Improved Engagement and Motivation Studies have shown that audio-visual interventions and cooperative learning make learning keyboard skills more engaging and motivating for junior secondary school students. Gamified learning platforms and

interactive lessons keep students interested and committed to the learning process (Aydin & Balim, 2020).

In the contemporary era of academic inquiry, there has been a notable surge in the prevalence of online learning tools and tutorials as a viable substitute for conventional classroom-based interventions. Due to the shift in educational delivery methods, audio-visual media and cooperative learning are becoming accessible tools and strategies to enhance students' learning of various school subjects. A research investigation was conducted to examine the efficacy of online video tutorials in enhancing students' keyboard proficiency, hence providing valuable insights into the potential advantages of these technologies for secondary school students (Tawil & Dahlan, 2021).

Despite the use of numerous novel methodologies, students in junior secondary school persist in performing poorly in computer-based typing accuracy assessments and display no enthusiasm towards the subject within the educational setting. This underscores the significance of incorporating experimentation and innovation into lesson plans and teaching methods, particularly in



light of the contemporary global landscape. It explores the ways in which the utilization of cooperative learning and audio-visual technology can impact the achievement and engagement of students studying computer concepts in an era characterized by information and communication technology (Ibemenji, Sunday & Chijioke, 2019).

The concept of computer keyboard mastery is included in the curriculum of computer studies for junior secondary school. The subject matter in question has been a staple of educational instruction for a considerable duration, yet the academic achievement of students has been unsatisfactory, hence motivating the researcher to explore other pedagogical approaches for imparting knowledge on the subject. However, if computer keyboard mastery is taught in schools without the use of audio-visual aids and cooperative learning in classroom instruction, a significant gap will emerge, leading to detrimental effects on the productivity and academic performance of both teachers and students. This led to the interest on this study on effect of Audio-Visual Intervention and Cooperative Learning on Mastery of Computer Keyboard

among Junior Secondary School students in Ede, Osun State.

### **Statement of the Problem**

Proficient attainment of essential computer skills holds significant importance for students, particularly at the Junior Secondary School level, as the significance of technological literacy continues to grow. Despite the widespread presence of computers and their incorporation into all facets of contemporary society, there is a discernible inadequacy in the typing skills of Junior Secondary School students. The aforementioned inadequacy presents a substantial obstacle not alone within the realm of scholastic achievement, but also in equipping students for the requirements of a technology-centric society. Insufficient mastery in keyboard skills may impede students' capacity to effectively utilize computers for educational purposes, interpersonal communication, and prospective professional prospects. The issue arises from a deficiency in the prevailing method, which frequently depends on conventional instructional techniques for the acquisition of keyboard mastery. The efficacy and engagement potential of these strategies may be insufficient in captivating

the attention and interest of contemporary students who are accustomed to digital technologies. As a result, it is imperative to investigate alternative educational methods that utilize audio-visual interventions and cooperative learning approach in order to improve the acquisition of keyboard mastery abilities which has prompted some concern among stakeholders, and it is against this background that the current research examined the Effects of Audio-visual Intervention and Cooperative Learning on mastery of computer keyboard among Junior Secondary School Students in Ede, Osun State.

### **Aim and Objectives of the study**

The aim of the study is to examine the effect of audio-visual intervention and cooperative learning method on mastery of computer keyboard among junior secondary school students in Ede, Osun State.

The objectives of the study are to:

- i. examine the main effect of audio-visual intervention on Junior Secondary School Students' keyboard mastery level in Computer Studies in Ede, Osun State;
- ii. examine the main effect of cooperative learning on Junior Secondary School

- Students' keyboard mastery level in Computer Studies in Ede, Osun State;
- iii. determine the interactive effect of audio-visual intervention and cooperative learning on Junior Secondary School students' keyboard mastery in Computer Studies in Ede, Osun State;

### **Hypotheses**

**H0<sub>1</sub>:** There is no significant main effect of audio-visual intervention on Junior Secondary School Students' keyboard mastery level in Computer Studies in Ede, Osun State.

**H0<sub>2</sub>:** There is no significant main effect of cooperative learning on Junior Secondary School Students' keyboard mastery level in Computer Studies in Ede, Osun State.

**H0<sub>3</sub>:** There is no significant interactive effect of audio-visual intervention and cooperative learning on Junior Secondary School students' keyboard mastery in Computer Studies in Ede, Osun State.

### **Methodology**

The adopted a 3x3 factorial quasi-experimental design which involved pre-test, post-test, non-randomized control and non-equivalent intact group. It focuses on audio-visual method, cooperative learning and

conventional method at three levels (2 treatment groups and a control group), mastery of computer keyboard at three levels (high, moderate and low). Audio-visual intervention and cooperative learning method is independent variables which was served as

the treatment group for the experimental group while the conventional teaching method were used for control group. The dependent variable was computer keyboard mastery in pre-test and post-test approach.

**Table 1: Research design layout**

Group	Pre-Test	Treatment	Post-Test
E <sub>1</sub>	Q <sub>1</sub>	X <sub>1</sub>	Q <sub>4</sub>
E <sub>2</sub>	Q <sub>2</sub>	X <sub>2</sub>	Q <sub>5</sub>
C	Q <sub>3</sub>	-	Q <sub>6</sub>

E<sub>1</sub> – Experimental 1 for Audio-visual

E<sub>2</sub> – Experimental 2 for Cooperative learning

C - Control Group

Q<sub>1</sub>- Pre-test for treatment group 1

Q<sub>2</sub>- Pre-test for treatment group 2

Q<sub>3</sub>- Pre-test for control group

Q<sub>4</sub>- Post-test for treatment group 1

Q<sub>5</sub>- Post-test for treatment group 2

Q<sub>6</sub> - Post-test for control group

X<sub>1</sub> - Treatment1

X<sub>2</sub> - Treatment 2

The population for the study was all the students in Government Junior Secondary School Two in Ede South Local Government Area, Osun State, Nigeria, which at the time of this study was 965. The study employed a

purposive sampling technique to identify three schools that meet the criteria of having appropriate computer facilities and qualified computer studies teachers available to teach the topic. This study involved three intact classes of Junior Secondary School two students selected from three different schools. The sample for the study was 261 students from three intact classes; two experimental and one control class. One school was designated as the control group, while two other schools served as the experimental groups 1 and 2 which were exposed to audio-visual intervention and engage in cooperative learning respectively, while the control group was only taught using

the conventional method of teaching. The study utilized five research instruments validated by experts in related field of study namely: (i) computer keyboard mastery (CKM), (ii) Video Tutorials, (iii) Interactive Keyboard Simulator (iv) Typing Games and (v) a lesson plan structure provided to facilitate the teaching of computer keyboard mastery, which serves as the focal point of the study. The Computer Keyboard Mastery (CKM) involved the acquisition of precise timing skills. The video tutorials, interactive keyboard simulator, and typing games was acquired via YouTube and installed on the computer system. A pilot study was conducted to determine the reliability of the main research instrument which was the Computer Keyboard Mastery (CKM) through its administration to a sample of the population who did not participate in the main study. Kuder Richardson (KR-20) formula was used to find the reliability value

of the instruments having a result of 0.75 value.

An ethical approval of the principals of the selected schools was obtained as well as the consents of the teachers and cooperations of the participating students before the administration of the instruments to the students. The study lasted ten (10) weeks. The first (1) week was used to train the teachers who assisted in the study. Two (2) weeks were used to administer the pre-test to all the groups, five (5) weeks were used for the treatment, while a space of two (2) weeks were used for the administration of the post-test. The researcher and the research assistants noted and record the time each student used to complete the task given to them. The hypotheses formulated for the study were tested using analysis of covariance (ANCOVA) at 0.05 level of significance.

### Results of Findings

**Table 2: Frequency Table showing Gender Distribution of the Respondents**

Gender	Frequency	Percentage
Male	94	36.0
Female	167	64.0
Total	261	100.0

Table 2 revealed that 94 (36.0%) of the respondents are Male while 167 (64.0%) of

the respondents are Female. Majority of the respondents are Females.

**Table 3: Frequency Table showing Group of the Respondents**

Class	Frequency	Percent	Cumulative Percent
Control	102	39.1	39.1
Experimental (Audio-Visual)	78	29.9	69.0
Experimental (Cooperative)	81	31.0	100.0
Total	261	100.0	

*Source: Fieldwork 2024*

Table 3 showed that 102 (39.1%) of the respondents were exposed to conventional learning as the control group, 78 (29.9%) were exposed to Audio-visual aid to constitute the first experimental (Audio-visual) group while

the remaining 81 (31.0%) of the respondents were exposed to cooperative learning to constitute the second experimental (Cooperative learning) group.

**H0<sub>1</sub>:** There is no significant main effect of audio-visual intervention on Junior Secondary

School Students' keyboard mastery level in Computer Studies in Ede, Osun State.

**Table 4: ANCOVA Table showing the significance main effect of audio-visual intervention on Junior Secondary School Students' Keyboard Mastery Level in Computer Studies in Ede, Osun State**

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
<b>Corrected Model</b>	7919.803 <sup>a</sup>	2	3959.901	568.795	.000	.865
<b>Intercept</b>	5.022	1	5.022	.721	.397	.004

<b>Pre</b>	80.681	1	80.681	11.589	.001	.061
<b>Audio-Visual</b>	7918.520	1	7918.520	1137.40	.000	.865
6						
<b>Error</b>	1232.258	177	6.962			
<b>Total</b>	224295.000	180				
<b>Corrected</b>	9152.061	179				
<b>Total</b>						

**a. R Squared = .865 (Adjusted R Squared = .864)**

Table 4 showed that there is a significant main effect of audio-visual intervention on Junior Secondary School Students' Keyboard mastery level in computer studies in Ede, Osun State ( $F_{(1,177)}=1137.406$ ,  $p<0.05$ ,  $\eta^2=0.865$ ) with the probability level lesser than 0.05 level of significance at  $p=0.000$ . The partial Eta squared (0.865) shows that the introduction of Audio-visual

has a great effect on keyboard mastery level in computer studies (0.865) accounting for 86.5% effect size of the respondents. The null hypothesis that there is no significant main effect of audio-visual intervention on Junior Secondary School Students' Keyboard mastery level in computer studies in Ede is therefore rejected.

**Table 5: Estimated Marginal Means of audio-visual intervention on Junior Secondary School Students' Keyboard Mastery Level in Computer Studies**

<b>Group</b>	<b>Mean</b>	<b>Std. Error</b>	<b>95% Confidence Interval</b>	
			<b>Lower Bound</b>	<b>Upper Bound</b>
<b>Control</b>	40.395 <sup>a</sup>	0.262	39.879	40.911
<b>Experiment (Audio Visual)</b>	26.958 <sup>a</sup>	0.299	26.367	27.549

Table 5 revealed that participants exposed to Audio-visual (treatment group) intervention had lower posttest mean ( $\bar{x}$ ) score of 26.958 on junior secondary school students keyboard mastery level in computer studies than other respondents in the control group with posttest mean ( $\bar{x}$ ) score of 40.395. This means that respondents exposed to Audio-Visual intervention (treatment group) performed better than those in the control group. It

implies that Audio-visual intervention was an effective method that improved students' intervention on junior secondary students' keyboard mastery level in computer studies.

**H0<sub>2</sub>:** There is no significant main effect of cooperative learning on Junior Secondary School Students' keyboard mastery level in Computer Studies in Ede, Osun State.

**Table 6: ANCOVA Table showing the significance main effect of cooperative learning on Junior Secondary School Students' Keyboard Mastery Level in Computer Studies in Ede, Osun State**

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Squared	Eta
Corrected Model	8385.708 <sup>a</sup>	2	4192.854	562.574	0.000	0.862	
Intercept	105.833	1	105.833	14.200	0.000	0.073	
Pre	1.922	1	1.922	0.258	0.612	0.001	
Cooperative Learning	8383.090	1	8383.090	1124.796	0.000	0.862	
Error	1341.538	180	7.453				
Total	225169.000	183					
Corrected Total	9727.246	182					

a. R Squared = 0.862 (Adjusted R Squared = 0.861)

Table 6 illustrated that there is a significant main effect of cooperative learning on Junior

Secondary School Students' Keyboard mastery level in computer studies in Ede,



Osun State ( $F_{(1,180)} = 1124.769, p < 0.05, \eta^2 = 0.862$ ) with the probability level lesser than 0.05 level of significance at  $p = 0.000$ . The partial Eta squared (0.862) shows that the introduction of cooperative learning has a great effect on keyboard mastery level in computer studies (0.862) accounting for

86.2% effect size of the respondents. The null hypothesis that there will be no significant main effect of cooperative learning on Junior Secondary School Students' keyboard mastery level in Computer Studies is therefore rejected.

**Table 7: Estimated Marginal Means of cooperative learning intervention on Junior Secondary School Students' Keyboard Mastery Level in Computer Studies**

Group	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Control	40.346 <sup>a</sup>	0.270	39.813	40.880
Experiment (cooperative learning)	26.712 <sup>a</sup>	0.303	26.114	27.311

Table 7 revealed that participants exposed to cooperative learning (treatment group) had lower posttest mean ( $\bar{x}$ ) score of 26.712 on junior secondary school students keyboard mastery level in computer studies than other respondents in the control group with posttest mean ( $\bar{x}$ ) score of 40.346. This means that respondents exposed to cooperative learning aid (treatment group) performed better than those in the control group. It implies that

cooperative learning was an effective method that improved students' intervention on junior secondary students' keyboard mastery level in computer studies.

**H03:** There is no significant interactive effect of audio-visual intervention and cooperative learning on Junior Secondary School students' keyboard mastery in Computer Studies in Ede, Osun State.

**Table 8: ANCOVA Analysis showing the interactive effect of audio-visual intervention and cooperative learning on Junior Secondary School students’ keyboard mastery in Computer Studies in Ede, Osun State**

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	11325.825 <sup>a</sup>	3	3775.275	418.123	.000	.830
Intercept	41.166	1	41.166	4.559	.034	.017
Pre	38.926	1	38.926	4.311	.039	.016
Treatment Groups	11325.825	2	5662.912	627.184	.000	.830
Error	2320.482	257	9.029			
Total	283155.000	261				
Corrected Total	13646.307	260				

a. R Squared =0 .830 (Adjusted R Squared = 0.828)

Table 8 indicated that there is a significant interactive effect of audio-visual and cooperative learning intervention on Junior Secondary School Students’ Keyboard mastery level in computer studies in Ede, Osun State ( $F_{(1,128)} = 0.057, p < 0.05, \eta^2 = 0.830$ ) with the probability level lesser than 0.05 level of significance at  $p = 0.000$ . The partial Eta squared (0.830) shows that

audio-visual and cooperative learning has interactive effect on keyboard mastery level in computer studies (0.830) accounting for 83.0% effect size of the respondents. The null hypothesis that there will be no significant interactive effect of audio-visual and cooperative learning on Junior Secondary School Students’ keyboard mastery level in Computer Studies is therefore rejected.

**Table 9: Estimated Marginal Means of interactive effect of audio-visual intervention and cooperative learning on Junior Secondary School Students’ Keyboard Mastery Level in Computer Studies**

Group	Mean	Std. Error	95% Confidence Interval
Adenike, O.M., Olajumoke, S.C. & Allwell, A. <span style="float: right;">347</span>			

			<b>Lower Bound</b>	<b>Upper Bound</b>
Control	40.372 <sup>a</sup>	0.298	39.785	40.958
Experiment (Audio-Visual)	26.986 <sup>a</sup>	0.341	26.315	27.657
Experiment (Cooperative Learning)	26.718 <sup>a</sup>	0.334	26.061	27.376

Table 9 revealed that the 2-way interactive comparison of the three groups combined, participants exposed to Audio-Visual (treatment group) had lower posttest mean ( $\bar{x}$ ) score of 26.986 cooperative learning (treatment group) had lower posttest mean ( $\bar{x}$ ) score of 26.718 on junior secondary school students keyboard mastery level in computer studies than other respondents in the control group with posttest mean ( $\bar{x}$ ) score of 40.372. This means that respondents exposed to audio-visual aid and cooperative learning aid (treatment group) performed better than those in the control group. However, those of cooperative learning have least time compared to others. It implies that audio-visual and cooperative learning were effective methods that improved students' keyboard mastery level in computer studies.

**Discussion of Findings**

Result of test on hypothesis one indicated that the use of Audio-visual aids has a significant

main effect on the degree of proficiency in keyboard skills in computer studies. The effect size of this impact is 0.865, which accounts for 86.5% of the variation seen in the respondents' performance. The null hypothesis, which states that there is no significant main effect of audio-visual intervention on Junior Secondary School Students' Keyboard mastery level in computer studies in Ede, is rejected. This finding aligns with a previous study conducted in Awka North Local Government Area of Anambra State which was conducted to determine the impact of using audiovisual aids to enhance the teaching and learning of computer science in Senior Secondary School. The results indicate that the use of audiovisual materials in computer science education has a positive influence on students' academic performance (Juliana, Jacquilin & Benedeth, 2019).

The test result of hypothesis two reviewed a significant main effect of cooperative learning

on Junior Secondary School students' keyboard mastery level in computer studies in Ede, Osun State as the probability level obtained was less than 0.05 level of significance at  $p=0.000$ . The partial Eta squared (0.862) shows that the introduction of cooperative learning has effect on keyboard mastery level in computer studies (0.862) which accounted for 86.2% effect size of the respondents. This implies that the null hypothesis two stating that there is no significant main effect of cooperative learning on Junior Secondary School Students' keyboard mastery level in Computer Studies is therefore rejected. The above finding is in line with recent study on the effect of cooperative learning on computer assisted instruction (CAI) settings on senior secondary students' performance in physics. Findings from this previous study indicated that learning with the use of cooperative learning enhanced students' performance in physics. Similarly, students' academic levels had significant influence on their performance (Anne & Russell, 2022; Adriana & Kudosz, 2023).

The finding from hypothesis three indicates a significant interactive effect of audio-visual intervention and cooperative learning strategy on Junior Secondary School Students'

keyboard mastery level in computer studies in Ede, Osun State. Based on the result ( $F_{(1,128)}=0.057, p<0.05, \eta^2=0.830$ ) with the probability level less than 0.05 level of significance at  $p=0.000$ . The partial Eta squared (0.830) shows that audio-visual intervention and cooperative learning strategy have interactive effect on keyboard mastery level in computer studies (0.830) accounting for 83.0% effective size on the respondents. The null hypothesis that there is no significant interactive effect of audio-visual and cooperative learning on Junior Secondary School students' keyboard mastery level in Computer Studies is therefore rejected. The study corroborated the previous research that was to examine the relationship between the usage of instructional materials, cooperative learning and the academic performance of students in Senior Secondary Schools in Osun State. The findings of this previous study revealed that students who were taught using audio-visual instructional materials and cooperative learning performed better than those who were not taught with the combination of these strategies (Tawil & Dahlan, 2021).

### Conclusion

Based on the findings of this research, the study concluded that, the use of audiovisual

intervention and cooperative learning strategies in teaching, learning and mastering of computer keyboard in the study has helped to improve students' learning of the computer. The use of Audiovisual intervention and cooperative learning strategies assisted the roles of the computer study teachers at the Junior secondary school, to teach more effectively especially the concept of keyboard mastering thereby making the learners more interested in the subject. It is also concluded that audiovisual intervention and cooperative learning strategies would assist both the teacher and the students to learn more easily and more speedily hence, the importance of the need for adopting the audiovisual as an intervention and adopting cooperative learning strategies in teaching the skill of typing on the computer at the Junior secondary school.

### Recommendations

Based on the findings from this study, the following are the recommendations suggested;

1. Audio-visual intervention should be adopted in teaching and learning of computer keyboard mastery at the Junior Secondary Schools to enhance the learning of computer studies;
2. Cooperative learning should be adopted should be adopted in teaching and

learning of computer keyboard mastery at the Junior Secondary Schools to enhance individual student's learning of the computer studies; and

3. Combination of both audio-visual intervention and cooperative learning should be adopted in teaching and learning of computer keyboard mastery at the Junior Secondary Schools for effectiveness.

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