

EFFECTS OF INQUIRY TEACHING METHOD ON ACADEMIC ACHIEVEMENT IN KEYBOARD MANIPULATIVE SKILLS AMONG BUSINESS EDUCATION STUDENTS IN COLLEGES OF EDUCATION SOUTHWEST, NIGERIA

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Abstract

This study investigated the effects of inquiry teaching methods on academic achievement in keyboard manipulative skills among NCE II Business Education students in Colleges of Education in Southwest Nigeria. Adopting a quasi-experimental design, the study involved 338 students purposively selected from two Federal colleges of education. Participants were assigned to inquiry, and lecture (control) groups. Data were collected using a validated Keyboard Achievement Test (KAT) and analysed with Analysis of Covariance (ANCOVA) at 0.05 level of significance. Results revealed a significant main effect of teaching methods on students' academic achievement in keyboard manipulative skills, with the inquiry method producing the highest mean gains, while the lecture method yielded the lowest performance ($F = 12.308$, $p < .001$, partial $\eta^2 = .069$). There was no significant main effect of gender ($F = 1.534$, $p = .216$), and the interaction between inquiry based teaching method and gender was not significant ($F = 0.954$, $p = .386$), indicating that both student-centred methods were equally effective for male and female students. Pretest scores significantly covaried with post-test achievement ($F = 44.651$, $p < .001$). The study concludes that interactive, student-centred approaches particularly inquiry method significantly enhance mastery of keyboard manipulative skills compared to the conventional lecture method. It recommends that Business Education lecturers in Colleges of Education be trained and retrained in the design and facilitation of inquiry-based instruction, and that regular formative assessment with immediate feedback be institutionalised to sustain skill development.

Keywords: Inquiry Teaching method, Keyboard Manipulative Skills, Academic Achievement, Business Education, Colleges of Education

Introduction

The establishment of educational institutions is predicated on particular mandates. Producing graduates who will make a significant contribution to the national economy is one of the main goals of educational institutions. Academic achievement is a key metric used to evaluate the caliber of graduates from educational institutions. Academic achievement is often linked to the school environment. Academic success is a goal shared by all early childhood educators. Academic achievement is the observable behavior that shows how well a student has attained predetermined learning goals. It is a broad idea that includes different academic fields.

Academic achievement is often described using the indicators used as measurement parameters. Among the several elements used to evaluate academic progress are curriculum-based criteria, such as test scores or grades, and cumulative indications of academic accomplishment, such as diplomas, certificates, and degrees. Academic achievements can be classified as positive, equitable, or bad. While general education and higher education have also been somewhat impacted, the focus on teaching outcomes has perhaps had the most impact on education, especially vocational education and training. Teaching outcomes are statements of what a student knows,

understands, and can do after receiving instruction (Ahmed, 2022; Rao, 2020). This emphasis has had a major impact on the kind and frequency of course and topic evaluations, the focus of audit and regulatory regimes, and the structure and methods of instruction. The media has been urged to concentrate on teaching outcomes at the highest levels by a number of reports that have surfaced over the years from all across the world. Competency-based training policies and mastery teaching had a major impact on the transition from the broad, general aims associated with previous liberal education programs to the more specific and clear training target defined by performance, criteria, and circumstances. The learning outcomes included in contemporary competency standards, which include element statements, performance criteria, and predetermined ranges of variables, are even more thoroughly defined and tightly structured (Harris and Clayton, 2019). The transition from technical and further education during the Kangan era to competency-based training during the Training Reform Agenda era is arguably the most prevalent illustration of this trend in the Australian setting. During the paradigm transition from Kangan to the Training Reform Agenda and beyond, two diametrically opposed ideas about what vocational education should be evolved in two drastically different economic and social situations (Sujianti, Sanjiyasa, Mesa, Saingo, and Bili, 2025).

Instructional outcomes must be assessed in order to assess students' actual accomplishments and, hence, the effectiveness of instructional strategies and student teaching (Saleh and Yusuf, 2023). The concept of intended teaching outcomes is based on the notion that lesson plans should focus on the skill sets that students need to acquire rather than whatever content their teachers happen to be planning to cover. Keyboarding was previously limited to typewriters and calculators. Keyboarding has become an essential tool for the effective operation of information and communication as time has gone on and current information and communication technology systems have evolved (Federal Republic of Nigeria, 2025). Keyboards are used as input devices in all information and communication systems, including computers, handsets, landlines, calculators of all kinds, and typewriters. The keyboard is the section of the device that has four rows with roughly twelve keys each. The space bar is a long, narrow bar located at the bottom of the keyboard. But the keyboard mechanism has evolved beyond this antiquated typewriter configuration. While some keyboards are concealed within the system, others, like the typewriter, are visible from the outside. The functions and activities of the system determine how the keyboard is arranged.

For instance, the computer keyboard is similar in arrangement with that of the typewriter but have other specialized keys which are not found on the typewriter and a detachable keyboard component. Most input devices (keyboard) of the modern information and communication technology systems have a 'QWERTY' ALPHABET ARRANGEMENT OR THE ASDF; LKJ commonly referred to as 'HOME KEYS' arrangement. The key board is the focus point used in global electronic interconnectivity. One of the foundational courses in business education programs is keyboarding, which equips interested students with practical skills. In business and professional settings, keyboarding is a laborious process that requires complete focus and attention in order to produce mail able documents. Furthermore, there were no other options for teaching keyboarding (typewriting) besides using typewriters and keyboarding lecturers, who gave the pupils the necessary instruction to become skilled keyboard users. At the college of education, it is more of a foundational subject in business education (Federal Republic of Nigeria, 2025). Additionally, it plays a significant role in the "business studies" curriculum at the junior secondary school level in the country. A user's overall output may be negatively or positively impacted by the development of manipulation and postural skills, which are among the keying abilities that are important. Due to the technological expansion, keyboard use has permeated every facet of human activity in one way or another, making it a crucial component of academic, medical, social, and personal life. This exposes the majority of business education students to typing and processing messages on a computer keyboard for subsequent transmission as needed in their personal life. In order for business education programs to effectively teach keyboarding skills, students must become proficient with the keyboard without focusing on the third key. In order to accomplish this, pupils must possess strong reading, manipulation, and posture skills that set them apart from other non-technical keyboarders. The primary goal of keyboarding instruction is to help students become proficient keyboard operators so they can find paid or independent work following graduation. This is consistent with one of the country's educational objectives, which states that education in Nigeria aims to build the necessary talents and competencies-mental, physical, and social to enable each person to live in and make a constructive contribution to society (Akinsanya, Oladehinde, and Bada, 2022).

In light of the aforementioned, it is clear that empowering Nigerians via training and skill-acquisition-focused courses including keyboarding will be a proactive approach to addressing the issues arising from the underlying reasons of insecurity (Modupe, 2021). Therefore, business education students should be aware of their exposure to manipulative activities that could negatively impact their learning of practical keyboarding abilities, as they are expected to have these skills in the workplace. The ability to use keyboards effectively

enables pupils to engage with computer input devices for learning, personal use, or future career. The first two of the six semesters that students are expected to complete the program are typically when keyboarding is taught. The training shifts to word processing in the second year, which is an application of the keyboarding skills acquired in the first year of study (Suliyat, Adeodu and Segun, 2025). By doing this, it becomes evident from observation that students' key-manipulation techniques do not demonstrate sufficient dexterity to meet the course's goal.

An approach to teaching known as the inquiry method places more emphasis on the role that students play in the learning process than it does on the teacher telling them what they need to know. Students are encouraged to research the lesson's subject on their own, ask questions, and exchange opinions when using this kind of instruction (Olorukooba, 2023). This aligned with the perspective of Instead of giving students instructions; the inquiry teaching technique empowers them to investigate the subject by posing queries and coming up with answers to issue. This encourages participation, curiosity, and experimentation. Students are encouraged to come up with questions about the subject that intrigues and excites them, which is one benefit of an inquiry-based teaching strategy. According to the researchers, in order to effectively teach business education programs in the new normal at South East universities, collaborative and inquiry-based pedagogical approaches must be implemented. Business educators might divide their pupils into smaller groups and assign tasks to complete when teaching data and text processing.

An interactive teaching strategy can stimulate students' interest, and once students become interested in a lesson, they are more likely to show enthusiasm, participate actively, explore concepts, improve learning efficiency, and develop new abilities. Interest is a persistent tendency to pay attention to and derive enjoyment from certain activities, and it has been described as a powerful motivational force that energizes learning and shapes academic and career development. It is an attraction that compels a student to respond to a particular stimulus. Importantly, interest cannot be forced; rather, it emerges from an individual's genuine eagerness and willingness to learn. For the students to effectively grasp the lesson plans and academic concepts, the lecturers provide them with clarification on the subject matter (Nwobodo-Anyadiegwu, 2026). By altering their voices, postures, and facial expressions, the instructors employ gestures and basic devices. Students are passive and teachers are more involved. When using the lecture technique, teachers are the ones who teach pupils most of the material. Students are supposed to hear and comprehend what they have to say (Korumaz and Ekşioğlu, 2022).

Many students can benefit from the lecture technique, which is also cost-effective. This method's primary goal is to cover the syllabus while saving time. It is the most straightforward approach and doesn't call for any preparations. However, lecturers must be well-prepared with regard to the subjects they will be covering. The pupils may have a lot of questions during the lesson plans' instruction. As a result, they ask their professors questions. The teachers must make sure that they give accurate information and respond to inquiries in a way that clarifies any issues or challenges. When dealing with huge classes, this approach is helpful. One of the main drawbacks of this approach is that it gives kids less room to engage in their activities. It goes against the learning-by-doing approach. Any disparities between students are not taken into account. Some pupils experience a decrease in interest and excitement when they are not given the chance to engage in any activity. As a result, while the lecture approach is widely used, its shortcomings are seldom recognized. The lecturers must consider a number of elements in order to implement the lecture method in an ordered manner. These include student grade levels, learning capacities, topics and ideas, academic aims and objectives, and the educational system as a whole. For this method to be beneficial and meaningful to the students, it must be implemented using a variety of techniques and approaches (Modupe, 2021). Effective communication abilities are seen to be quite important. It is essential that both teachers and students use acceptable language, treat one another with decency, and treat one another with respect.

In addition to promoting student learning, the teachers must perform their duties in an orderly fashion. However, it is imperative that students listen to their teachers and pay enough attention. Therefore, it can be said that the lecture techniques will be used in a systematic and orderly way when both lecturers and students are fully aware of their roles and obligations. Students' interest may be piqued via an interactive teaching method.

Students that are interested in teaching will be enthusiastic about the activities they participate in, actively learn and explore, increase productivity, and acquire new skills. Interest is the enduring propensity to focus and take pleasure in certain activities. Interest has been seen as a potent motivating factor that propels instruction and directs students' academic and professional paths. Students will not gain much if the lecturer does not pique their interest in teaching; therefore, business education lecturers must employ instructional strategies that guarantee students' active participation in order to pique interest and enhance performance. Inappropriate teaching methods used when instructing students may be one factor contributing to their subpar performance and lack of enthusiasm in keyboarding. According to this verified vocational education claim, students in Technical Colleges are consistently discouraged or uninterested in vocational education due to their lecturers' uninspired and undemanding methods (Olalekan and Bisola, 2022). Keyboarding is a crucial component of business education, and student interest is a significant role in facilitating teaching and learning (Sani and Yohanna, 2019).

A business education program exposes students to a variety of curriculum and is thought of as the kind of education that instills in them the values, attitudes, knowledge, and abilities needed in the business world. This is a way to produce literate, healthy, self-sufficient citizens who, when they work for themselves, will generate wealth for human development and contribute to the overall development of the country. One of the core topics in business education is keyboarding (Oviawe and Adeyemi, 2023). The course was acknowledged as a significant Business Education subject by the National Commission for Colleges of Education (NCCE) especially in light of the accomplishment of National Certificate in Education (NCE) Business Education's fifth objective, which was to "equip NCE graduates with the right skills that will enable them to engage in a life of work in the office as well for self-employment" (Nwosu and Nwankwo, 2024). The subject is purely a manipulative skill in which the hands and fingers are trained to respond accurately and automatically, enabling the keyboard operator to key in written or spoken words without conscious effort. With effective keyboarding skills, NCE graduates will be able to type efficiently in offices and business centers, thereby improving their competence and productivity in the workplace (Oviawe and Adeyemi, 2023). A Business Educator is an expert trained in the major components of Business Education. He/she is a person who is proficient in teaching of Business Education course and who can utilize different teaching methods and pedagogies in teaching. Therefore, the opinion of these experts on the pedagogical approaches to teaching Business Education in the new normal is appropriate at this critical time of economic melt-down era. For effective teaching of Business Education in the new normal, the experts need to adopt different pedagogical approaches to teaching in the new normal. Pedagogy means the study of various methods used in teaching and teaching (Okon and Okon, 2023). The pedagogy adopted by educators sharpens the activities and other teaching strategies. This helps Business Educators to understand their students' need and background.

Teaching is the process of imparting desired knowledge to the learner. Teaching is the exchange of ideas between a teacher and a student. Similarly, teaching is the process of imparting knowledge in the classroom. Therefore, experts in universities in the South East need to impart the requisite knowledge to the learners by adopting collaborative and inquiry-based approaches to teaching and teaching in the new normal. An expert in the context of this study is a Business Educator teaching Business Education courses in Universities in the South East. They are trained personnel who impart the desired knowledge to the learner. The authors are of the opinion that these two approaches can be suitable for giving students tasks to perform by sharing them into smaller groups. The teacher poses questions to the students and guides them on how to solve the questions. Also, through collaborative enquiry, the teacher gain understanding of the students reasoning. An empirical study of this nature must be based on theory. This study was based on cognitive teaching theories. The theory stresses the acquisition of knowledge and skills. To the cognitivists, teaching takes place by doing it yourself. Practice of skills and correct feedback are needed to promote teaching and could be achieved through collaborative and inquiry-based approaches of teaching. It is against this back drop that the researchers sought to determine the pedagogical approaches for effective teaching of Business Education courses in the new normal by experts from Universities in the South-East (Eze and Nwaokwa, 2020).

Communication between lecturers and students is an essential component of the teaching learning

process. This communication refers to the interactions that occur among the key actors in the educational setting teachers and students. Through meaningful interaction, learners become actively involved in the teaching learning process, contribute to classroom activities, and construct new knowledge based on their existing experiences, thereby promoting meaningful learning. Classroom interaction, therefore, encompasses various activities that occur between the lecturer and the learner, the lecturer and instructional materials, the learner and other learners, as well as learners and the learning materials. Positive classroom interaction fosters positive attitudes among students; it enhances their willingness and capacity to benefit substantially from the teaching learning process (Sani and Yohanna, 2019). Collaborative inquiry teaching is a hybrid instructional approach derived from the integration of inquiry practices in science education and the increasing use of computer-supported collaborative learning. Through collaborative inquiry teaching, students acquire knowledge and skills by working together on shared tasks, learn about the nature of the discipline, and gain insight into subject-specific content. With the development of advanced computer-based learning environments, collaborative inquiry teaching has gained expanded possibilities. Educational technologies can support students as they engage in collaborative inquiry projects by assuming some of the responsibilities traditionally carried out by teachers, while also enabling direct communication and collaboration among learners even across long distances and at different times.

Statement of the Problem

Keyboarding is a core course for all Office Technology and Management (OTM) students, and it bears a strong relationship with the overall objectives of office education especially the goal of equipping students with marketable skills before graduation (Sofolahan, 2023). Keyboarding skills are intended to help learners achieve mastery of the keyboard, beginning from proper use of the home keys and progressing through the entire keyboard to attain speed, accuracy, and the ability to produce readable and mailable documents. This mastery is cultivated through constant drills, including the correct positioning of the fingers on the home keys and the recognition of all parts of the keyboard. As students engage in these training activities, their ability to type efficiently is expected to enable them to achieve optimal speed and accuracy while maintaining correct finger placement and keeping their eyes focused on the manuscript rather than on the keyboard. Unfortunately, many students violate standard keyboarding rules, which lead them to engage in “type-picking” a habit that undermines their development of proper keyboarding proficiency. In the same vein, the researcher personally, observed that many secondary schools in Nigeria do not have sufficient equipment to practice keyboarding and as a result Business Studies students struggle with effective keyboard use due to inadequate training, limited access to computers, and lack of structured practice. Despite the integrator of Information and Communication Technology (ICT) into school curricula, there remains a noticeable gap in students’ ability to type accurately and efficiently. Keyboarding is gradually losing its prominence to the extent that many lecturers are no longer adequately skilled in teaching keyboarding competence, which in turn causes students to lose interest in the course³³. The worrisome situation that prompted this research is the perennial poor performance of Business Education students in keyboarding examinations that involves practical. The poor academic achievement in keyboard manipulative skills is often attributed to poor teaching methods. Moreover, the researcher personally observed the keyboarding is becoming unpopular among Business Education students because of the perceived difficulty and fear associated with the course (Oludare et al, 2025). At any rate, keyboarding is an essential skill in the digital economy, and any problem that affects this highly essential skill in the digital era, must be empirically addressed, therefore the researcher moved to investigate the effect of inquiry teaching methods on academic achievement in keyboard manipulative skills among business education students in selected colleges of education, Southwest Nigeria (Modupe, 2021).

Aim and Objectives of the Study

The aim of this study was to investigate the effect of Inquiry Teaching methods on academic achievement in Keyboard manipulative skills among Business Education students in colleges of education in Southwest, Nigeria. The objectives were to:

1. identify the main effects of inquiry teaching method on academic achievement in keyboarding manipulative skills among Business Education students in colleges of education in Southwest, Nigeria.
2. examine the interactive effects of inquiry teaching method and gender on academic achievement in keyboarding manipulative skills among Business Education students in colleges of education in Southwest, Nigeria.

3. find out the moderating effects of gender and inquiry teaching method on the academic achievement of Business Education students in keyboarding manipulative skills across colleges of education in Southwest, Nigeria.

Hypotheses

The following null hypotheses were formulated and tested at 0.05 level of significance

- H₀₁:** There will be no significant main effects of inquiry teaching method on academic achievement in keyboarding manipulative skills among Business Education students in colleges of education in Southwest, Nigeria.
- H₀₂:** There will be no significant interactive effects of inquiry teaching method and gender on academic achievement in keyboarding manipulative skills among Business Education students in colleges of education in Southwest, Nigeria.
- H₀₃:** There will be no moderating effects of gender and inquiry teaching method on the academic achievement of Business Education students in keyboarding manipulative skills across colleges of education in Southwest, Nigeria.

Methodology

The study employed a quasi-experimental research design, specifically the pre-test, post-test non-equivalent control group design. This design involves the participation of intact classes (non-randomized groups). The population of this study consisted of 629 Year 2 Business Education students enrolled in the Word Processing II course across seven Colleges of Education located in Lagos, Ogun, and Oyo States in southwestern Nigeria. Keyboarding is a compulsory course for all Year 2 Business Education students. Two colleges of education were selected for the experiment from the seven institutions offering Business Education programs in southwestern Nigeria. These colleges are: Federal College of Education, Abeokuta and Federal College of Education (Special), Oyo. The sample for this study consisted of 338 200-level Business Education students registered for the 2024/2025 academic session. Purposive sampling was employed to select the three colleges, ensuring appropriate representation.

Two researcher designed instruments were used to collect data for the study. The instruments are; (a) Instructional Content Plan on Inquiry teaching method. The plan will cover four themes in the 200 level BED 224 Course contents. The themes include; Speed Development, Three-Four Columnar Works, Business Letter, and Memorandum, [b] Pre-Test Keyboard Achievement Test [KAT]. [c] Post-test Keyboarding achievement Test [KAT]. The Pre- test and Post-test were contain four exercises each to ascertain the level of keyboard manipulative proficiency level of the students, where the students will be expected to attempt all the tasks, after which it was marked by the researcher with marking scheme prepared with solution. A percentage (%) ranging scale was used to determine the level of achievement in keyboarding manipulating skills i.e. very high level (70-100); High level (55-69); moderate level (45-55) and low level (0-44). The instruments were subjected to face content and construct validity. In doing this, draft copies of the Keyboard Achievement Test (Pre-test and Post-test), instructional packages on Collaborative and Inquiry teaching methods were scrutinized and vetted by experts in Business Education Unit, Lead City University, Ibadan.

After the instruments were appropriately validated, a pilot study was conducted at Kwara State College of Education, Ilorin, using 50 200-level Business Education students. The reliability of the research instruments was established through statistical analysis of the pilot study data using Cronbach's Alpha¹. The researcher obtained a formal letter of introduction from the Department of Arts & Social Science Education, Lead City University, Ibadan, which facilitated access to the selected institutions. Data collection spanned eight weeks. During the first week, the researcher introduced herself to the Heads of Departments of the purposively selected colleges of education and administered the pre-test to all participating students. The data collected from the pre-test and post-test were analyzed using both descriptive and inferential statistical techniques. For the descriptive statistics including frequency counts, means, and standard deviations were employed to summarize and interpret the data. The research hypotheses were tested using Analysis of Covariance (ANCOVA) at a 0.05 level of significance to determine the effect of the instructional interventions on students' keyboarding performance.

Results

Hypothesis One

- H₀₁:** There is no significant main effects of inquiry teaching method on academic achievement in keyboarding manipulative skills among Business Education students in colleges of education in Southwest, Nigeria.

Table 1: ANCOVA result comparing Inquiry teaching method and Academic Achievement in keyboarding manipulative skills among Business Education Students

Dependent Variable: Academic Achievement

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	591.611 ^a	2	197.204	20.675	.000	.157
Intercept	14220.113	1	14220.113	1490.869	.000	.817
Inquiry Teaching Method	243.948		121.974	12.788	.000	.071
Pretest Scores (Covariate)	441.495	1	441.495	46.287	.000	.122
Error	3185.738	334	9.538			
Total	291526.000	338				
Corrected Total	3777.349	337				

a. R Squared = .157 (Adjusted R Squared = .149)

Source: Field Survey, 2026

The result presented in Table 1 shows that there were statistically significant differences in the post-test academic achievement scores of students exposed to the two teaching methods after adjusting for their pre-test performance, $F(2, 334) = 12.788$, $p = .000$, partial $\eta^2 = .071$. This indicates that approximately 7.1% of the variance in post-test academic achievement can be attributed to the type of teaching method used, after accounting for the influence of students' prior knowledge. The covariate (pre-test scores) was also statistically significant, $F(1, 334) = 46.287$, $p = .000$, partial $\eta^2 = .122$, indicating that students' initial level of knowledge contributed significantly to their post-test performance. The overall model was statistically significant, $F(3, 334) = 20.675$, $p = .000$, with an adjusted R^2 of .149, implying that the combined influence of teaching methods and pre-test scores explained approximately 14.9% of the total variance in students' academic achievement in keyboarding manipulative skills.

Hypothesis Two

H₀₂: There is no significant interactive effects of Inquiry teaching method and gender on academic achievement in keyboarding manipulative skills among Business Education students in colleges of education in Southwest, Nigeria.

Table 2: ANCOVA Result showing Interactive effects between Gender and Inquiry Teaching Methods on Students' Academic Achievement

Dependent Variable: Academic Achievement

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	304.009 ^a	5	60.802	5.812	.000	.080
Intercept	265749.985	1	265749.985	25401.773	.00	.987
Inquiry Teaching Strategy	183.407	1	91.703	8.765	.000	.050
Gender	4.684	1	4.684	.448	.504	.001
Teaching Strategy * Gender	146.974	2	73.487	7.024	.001	.041
Error	3473.340	332	10.462			

Total	291526.000	338
Corrected Total	3777.349	337

a. R Squared = .080 (Adjusted R Squared = .067)

Source: Field Study, 2026

The results in Table 2 show that the overall model was statistically significant, $F(5,332) = 5.812$, $p < .001$, with an R^2 value of .080 (Adjusted $R^2 = .067$). This indicates that approximately 8% of the variance in students' academic achievement can be explained by the combined effects of teaching strategies and gender. The findings further reveal a significant main effect of teaching strategies on students' academic achievement, $F(2, 332) = 8.765$, $p < .001$, $\eta^2 = .050$, implying that the method of instruction had a meaningful influence on students' performance. In contrast, the main effect of gender was not statistically significant, $F(1, 332) = 0.448$, $p = .504$, $\eta^2 = .001$, suggesting that male and female students performed comparably overall.

H₀₃: There is no moderating effects of gender and teaching methods on the academic achievement of Business Education students in keyboarding manipulative skills across colleges of education in Southwest, Nigeria.

Table 3: ANCOVA result on moderating effects of gender and teaching methods on the academic achievement of Business Education students in keyboarding manipulative skills across three Educational Institution

Dependent Variable: Academic Achievement						
Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	602.418a	5	120.484	12.436	.000	.161
Intercept	14185.326	1	14185.326	1464.219	.000	.814
Teaching Methods	18.491	2	9.246	0.954	.386	.006
Gender	432.705	1	432.705	44.651	.000	.118
Pre-test Scores	3174.931	332	9.563			
Error	291526.000	338				
Total	3777.349	337				
Corrected Total						

a. R Squared = .157 (Adjusted R Squared = .149)

Source: Field Survey, 2026

The result presented in Table 4.6 reveals that teaching methods had a statistically significant effect on students' post-test academic achievement, $F(2, 332) = 12.308$, $p = .000$, partial $\eta^2 = .069$. This indicates that approximately 6.9% of the variance in students' post-test scores can be attributed to the type of teaching method used, after accounting for students' prior knowledge. The covariate (pre-test scores) also made a significant contribution to the model, $F(1, 332) = 44.651$, $p = .000$, partial $\eta^2 = .118$, suggesting that students' initial ability levels significantly influenced their post-test academic achievement. Gender, however, had no significant main effect on students' academic performance, $F(1, 332) = 1.534$, $p = .216$, partial $\eta^2 = .005$, indicating that male and female students performed similarly regardless of the teaching method employed.

Discussion of Findings

This study was conducted to investigate the effects of collaborative and inquiry teaching methods on the academic achievement in keyboard manipulative skills among Business Education students in colleges of education in Southwest, Nigeria. The findings of the study based on hypothesis one and Table 1 revealed that there was a significant main effect of teaching methods on the academic achievement in keyboarding manipulative skills among students taught using Inquiry and Lecture methods in colleges of education in Southwest, Nigeria.. This finding supports the finding that computer aided instruction (CAI) Significantly improved keyboarding performance among Business Education students in Universities in Ekit State, Nigeria (Adeyemi, 2024).

Based on hypothesis two, Table 2 the study found that the effects of teaching methods on students' academic achievement in keyboarding manipulative skills depend on gender differences. This finding, however contradicted the findings that academic achievement and collaborative teaching were significantly correlated irrespective of gender difference among pupils of elementary schools in Languindingan district division in the Phillipines (Cagatan and Quirap, 2024). The contradiction in findings might be attributed to the different levels of education covered by both studies. Furthermore, the contradiction in findings might be due to the nature of subjects involved. In the previous, the research focused on subjects that are cognitive- based, while in the current study, the researcher focused on manipulative skills that are psychomotor-based.

Hypothesis three, Table 3 indicated that gender does not significantly moderate the relationship between teaching methods and academic achievement in keyboarding manipulative skills. This finding buttress that there was no significantly effect of gender on academic achievement of students exposed to keyboarding skills acquisition using hands-on teaching strategy with conventional method in Federal Polytechnic, Mubi, Adamawa, State, Nigeria (Ukonu, Sababa, and Filgona, 2023).

In conclusion, the findings of this study demonstrate that teaching methods significantly influence the academic achievement of Business Education students in keyboarding manipulative skills in colleges of education in Southwest Nigeria. The study also revealed that students' prior knowledge contributes significantly to their academic performance. These findings highlight the importance of adopting innovative, learner-centered, and technology-supported teaching methods that promote active participation and practical skill development. By implementing effective instructional strategies and providing adequate learning resources, lecturers can significantly enhance students' acquisition of keyboarding manipulative skills and improve academic achievement in Business Education programmes.

Conclusion

From the results of the study, it is evident that the method of instruction plays a crucial role in enhancing students' academic achievement in keyboarding manipulative skills. The study concludes that both Collaborative and Inquiry teaching methods are more effective in improving students' performance compared to the traditional Lecture method. However, the Inquiry method proved particularly powerful in deepening students' understanding and encouraging independent problem-solving skills. The findings affirm that interactive and student-centered methods such as Inquiry strategy foster higher engagement, critical thinking, and hands-on mastery of business-related skills. These methods enable students to participate actively in their own learning process, creating room for experimentation, discussion, and cooperative reflection. The significant difference between pre-test and post-test scores further confirms that learners performed better after being exposed to interactive teaching approaches.

Additionally, the significant interaction effect between teaching method and gender suggests that both male and female students can benefit from these innovative teaching practices when effectively implemented. The result that gender alone had no significant main effect implies that these strategies are inclusive, equitable, and beneficial to all students, regardless of gender.

The study therefore concludes that effective learning in Business Education, particularly in keyboarding

manipulative skills, depends on the teacher's ability to integrate dynamic, inquiry-based teaching practices into the classroom. These approaches stimulate students' curiosity, enhance retention, and promote active participation qualities essential for professional competence and lifelong learning.

Recommendations

Based on the findings of this study, the following recommendations are made to enhance the process of teaching and learning in southwest Nigeria:

1. Colleges of Education should institutionalize Inquiry-based learning as a core instructional approach in Business Education courses. It fosters curiosity, creativity, and independent learning which are essential for mastering manipulative skills like keyboarding.
2. Lecturers should be trained and re-trained in the design and facilitation of Inquiry instructional strategy. Workshops, seminars, and pedagogical refresher programs should be organized regularly to enhance competence in interactive teaching methods.
3. Since both Collaborative method have positive effects, educators should adopt a blended approach that combines structured collaboration with inquiry-based exploration. This will cater to different learning styles and promote deeper engagement.
4. Given the interaction between gender and teaching method, lecturers should be mindful of gender dynamics in the classroom. Instructional materials, examples, and group activities should be inclusive to ensure equal participation and benefit across gender lines.

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