
**EVALUATING THE EFFECTS OF INQUIRY BASED LEARNING ON
NIGERIA STUDENTS' ORAL AND WRITTEN COMMUNICATION**

*Nkechinyere Nkem Iwe, PhD ***Gift Chidi-Onwuta, PhD ***Christabelle P.C Chikamadu (PhD)**English Unit, School of General Studies, Michael Okpara University of
Agriculture, Umudike, Abia State, Nigeria, nkeby@gmail.com
Chidi-onwuta.gift@mouau.edu.ng, chychikamadu@gmail.com*

Abstract: This study aims to evaluate the effects of inquiry based learning (IBL) on Nigeria students' oral and written communication skills. One hundred and twenty (120) first year undergraduate students of Michael Okpara University of Agriculture, Umudike, Nigeria were purposively chosen for the study. Pre-test and post-test results elicited through marking of their written rubrics with four scale range values (Content, Expression, Coherency, and Mechanical Accuracy) and students' perceptions on their experiences on inquiry-based activities and presentations were used to generate data for analysis. The participants were divided into six member groups with topics related to their courses to investigate, write and present to students' audience. Each group was given series of two different topics before and after inquiry based instruction to assess their written and oral communication skills. While the quantitative data were analyzed using one-way repeated measures ANOVA, the qualitative data were analyzed using content analysis. The findings of the study show significant increase in post-test results of respondents after a careful inquiry-based pedagogy both for weak and non-weak students. Although inquiry based learning activities create initial untold fear among students from their perception; engaging them in IBL engenders learner autonomy, facilitates strong interpersonal oral and written communicative skills and promotes collaboration. Content analyses reveal IBL as an approach that enhances active participation, deep content knowledge, classroom relationships and promotes sense of responsibility which are vital communication skills. Therefore, inquiry based instruction is suggested to totally replace the traditional lecture method of teaching and should be used in oral and written communication classrooms.

Keywords: Language, inquiry-based learning, oral communication, written communication..

Received: 12/08/2022

Accepted: 22/10/2022

Proofreading: 28/10/2022

Available online: 31/12/2022

Introduction:

Scientific approaches have been suggested and explored in second and foreign language teaching and learning with the primary aim of facilitating learning, promoting confidence among learners and consequently, enhancing positive academic achievements in language classrooms. Amongst the famous scientific based approaches is inquiry-based language learning (IBLL) proposed by Whewell (1859) in Fauziati (2014). Inquiry based approach to teaching was foremost used in science subjects and Mathematics (Rejeki, 2017) but was later adopted by second language teachers in language classrooms to enhance the acquisition of vocabulary and explore grammatical structures (Lee, 2014). It was also explored by other linguists to boost students' engagement and facilitate curiosity among learners (Wolpert-Gawron, 2016) as well as promote students' receptive and productive English language skills (Kampa & Villna, 2016). It was in all, found to be helpful in the analysis of learning problems and proffering solutions thereafter.

REVIEW OF LITERATURE

Many attempts to define inquiry and inquiry-based learning abound in literature. The definition of Sagala (2004) and Latif (2011) is of value to our operations in this study. Both researchers see inquiry as an approach that is able to develop the values and attitudes that are highly required to enable students to think scientifically. This definition puts inquiry-based instruction at a scientific pedestal. Trowbridge (1990) defined inquiry as the process of defining and investigating problems, formulating hypothesis, planning experiment, collecting data, and describing the conclusions of the problems.

Trowbridge's definition suits adult learners who have the capacity to engage those levels of deep critical analysis methods in their course of learning a new thing. So, inquiry instruction, especially when it involves pre-school or middle school learners does not need to involve those advanced forms of learning. Fauziati (2014) definition of IBLL is found basic. He sees the approach as a process of seeking truth, information, or knowledge by questioning. It is a learning process where students are actively engaged by making real world connections through exploration and high-level questioning. The students, by this approach are central to the process of learning by actively engaging the learning tool of questioning and finding the answers by themselves. They construct knowledge rather than receiving knowledge as found in other traditional methods of learning, which made learners passive in language classrooms. Imperatively, IBLL has the capacity to transform passive learners into active and engaged students. The teacher, technology and learning community are possible facilitations accessible to learners in their efforts to inquiry based learning. IBLL is one of the inductive approaches to learning, with problem-based learning (PBL), project based learning, case -based learning and discovery learning (Rejeki, 2017). It combines the research methods of observation, analysis of data and generation of facts, employing appropriate procedures and guiding principles. Advance methods of investigations, exploration, search, quest, research, pursuit, and study are possible activities found in inquiry based learning depending on the age of the learners (Kuklthau, Maniotes & Caspri in Rejeki, 2017). IBLL is rooted in deep thinking which is inspired by asking questions. By engaging students in researching

*Corresponding Author: | Email: nkeby@gmail.com

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topics and onward reflection on what they've learnt, IBLL model develops higher order thinking skills, such as analyzing, evaluating and problem solving amongst learners. The teacher therefore, plays the role of a facilitator, providing and supporting learners to achieve set objectives. Learners, on the other hand, gather and produce information to widen their horizon of knowledge and world view and take responsibility for their learning progress.

IBLL amongst other benefits, enhances learning experiences for all areas of learning, teaches learners skills needed for all areas of learning, fosters curiosity in students, deepens students' understanding of topics, allows students to take ownership of their learning, increases engagement with material and creates a love of learning. The areas of language learning where inquiry benefited second language learners include: grammar, vocabulary and cultural nuances. If IBLL is as effective as extant literature suggests, why then is the approach missing out in the current instruction space? Shanmugavelu, Parasuraman, Arifflin, Kannan, and Vadivelu (2020) describe this approach as one that requires a lot of teacher involvement. The planning, designing of teaching materials, designing questioning strategies, designing teaching and learning strategies and evaluation, according to Shanmugavelu et al are all herculean tasks to be met by the teacher. The passion to walk students through the questioning strategy stage which is the most critical aspect of IBL must not be missing in the teacher. Shanmugavelu et al noted that the teacher must plan questions that can guide the students towards achieving the learning objectives; such questions invariably must be able to develop critical and creative thinking among students. Probing further, the three levels of questions: (i) for information (recall questions), (ii) questions that require interpretations, and (iii) high level questions in which students are required to develop tentative answers must be covered by the teacher. In the early stages of the implementation of IBL, the teacher must ensure he provides topics which are consistent with students' cognitive thinking and development in order to make such academic responsibility interesting to learners and enhance their understanding. By implication, implementation of IBL in any teaching environment requires teacher education in all levels of the stages required for appropriate delivery of the approach. The unfortunate situation is that IBL is not dominant in teachers' initial training (Dorier & Garcia, 2013). As a consequence, their relation to subject knowledge rarely reflects any IBL in perspective. Since initial training of teachers is bereaved of IBL skills, integration of inquiry in their teaching practices would be less optimal. To make teachers relevant in the new trend and equip them to make optimal use of the inquiry instruction, however, Anderson (2002) suggests regular in-service teachers' training and continuing professional development that completely support IBL.

Aside the teacher whose input is significant to the implementation of IBLL, Edelson, Gordin and Pea (2013) outlined other challenges to the successful implementation of inquiry-based learning. Prior to their observation, Schauble et al (1995) and later Kraijcik et al (1998) independently documented that children have difficulties conducting systematic scientific investigation. We must recall that IBL requires higher order thinking or investigation. Their documentation supports Shanmugavelu et al's later submission that successful and active engagement of learners in IBL requires giving them topics that are consistent with their cognitive thinking and development.

CHALLENGES OF IMPLEMENTING INQUIRY BASED LANGUAGE LEARNING

The experiences of Edelson et al show that failure to address any of the following challenges would hinder students from successfully engaging in meaningful investigations (inquiry) and therefore undermine learning. They include:

1. Motivation. Students must be sufficiently motivated for them to engage in inquiry that can yield meaningful learning. Gilakjani et al (2012) in Chidi-Onwuta (2016) outlined three levels of motivation that are accessible and should be employed by the teacher for effective learning achievements. First, by organizing class activities around the theme of self-expression, and by giving learners enough time to engage actively in the given responsibility (inquiry). Second, by providing quality instruction input, and providing learners opportunity to interact with peers, as well as ensuring that each learning activity is as vivid and tangible as possible, providing feedback on all levels of learning progress. When learners are not motivated by legitimate interest, according to Edelson et al, they fail to participate in inquiry activities. To show the importance of motivation in IBL, Soloway et al (1994) mentioned motivation as one of the three primary challenges for learner-centered design (IBL). Motivation is found to mediate the relation between language attitude and language achievement (Gardner & Macintyre, 1993). A motivated learner is primed to have a positive attitude towards a new content he engages to learn. There are however, problems influencing proper motivation of learners by the teacher. Gilakjani et al (2013) identify personality variables like lack of self-confidence, shyness, anxiety, and "learner helplessness" as major challenges of second language motivation. Again, learners whose affected filters are constantly up (rigid attitude towards a new language) do not have greater chances of achieving success in the target language. Those who easily achieve and attain high level of performance are those whose affected filters are low; such people are always ready to take risk. In order to lower learners' affected filter, Chidi-Onwuta and Oko (2018) suggest engaging learners in cooperative language learning where they work around a given academic responsibility with their peers. The teacher

presents a learning material to learners and allows them to create internal locus among themselves. Through group work, they achieve success in inquiry, self-actualization, fun, and satisfaction in the learning environment.

2. Accessibility of investigation techniques: Edelson et al (2013) observe that scientific investigation techniques such as data collection and analysis require good precision by students and careful articulation of facts which are not easily accessed in their day to-day learning and experiences. If learners are unable to master these skills, conducting meaningful investigation with accurate results would be unachievable. Learners at the beginning of their training and instruction must be drilled on how to perform tasks that their investigation requires. Again, their level of cognition must determine the nature of tasks to engage them with. To support this claim, Soloway et al (1994) suggests the need for the teacher to consider prior experiences of learners and the tools that are accessible to them across full diversity of abilities before engaging them in inquiry that are supposed to yield meaningful results.

3. Management of extended activities. Edelson et al (2013) observe that scientific investigation or inquiry requires proper planning and adequate coordination of activities and management of resources and work products. Traditional teaching programme does not provide opportunities for learners to organize and manage complex, extended activities but conscious and concerted efforts must be made by the teacher to guide learners to achieve the ultimate goal of open-ended inquiry. Every student should be made to be an inquirer and as Lee (2014) suggests, the teacher can achieve this shift (passive to active learner) by modeling or providing students with explicit guidelines.

4. The practical constraints of the learning context. Most learning environments are bereaved of the technology and other visual resources fit for inquiry based learning. Technology and teaching materials according to Chidi-Onwuta, Iwe & Chikamadu (2022) are tools that convey meaning without complete dependence on verbal symbols or language. The use of such material resources, especially in English language teaching as they further claim, is indispensable for successful mastery of the target language and other skills. By implication in this study, material resources would stimulate effective inquiry. Jarret (1997) earlier noted that introducing inquiry-based lessons is not the main problem but creating a whole school learning environment that supports inquiry. Providing sufficient visual learning tools and authentic materials, human capacity and space are basic supports for implementation of inquiry based learning. Those who teach in low resource environments, however, must be adaptable, engaging, creative, empathetic and patient with learners. Failure to work within the available technology and the lack of teaching qualities outlined above impede practical implementation of the content of IBL.

Despite the challenges, however, Gatt & Zammit (2017) from their study of two schools in Malta, explained that full implementation and shift from traditional pedagogy to inquiry-based learning is an achievable process which requires time and continual investment and support from the agents concerned.

TYPES OF INQUIRY BASED INSTRUCTION

Pappas (2014) listed four forms of inquiry commonly used in inquiry based instruction to include: confirmation inquiry, structured inquiry, guided inquiry and open inquiry. Confirmation inquiry is the easiest and most familiar form of inquiry (Banchi & Bell, 2008). Its goal according to Pappas is to confirm the results which perhaps had been earlier found. The teacher at this level gives learners both the question as well as the method to adopt to uncover the answer to which the result is already known. This type of inquiry helps learners to reinforce already established facts and to sharpen their investigative skills.

Structured inquiry is similar to confirmation inquiry. Learners are also provided with a question and the method of achieving the results; however, they differ in purpose. In structured inquiry as Pappas further explained, the goal is for learners to provide an explanation that is already supported by the evidence gathered during and through investigative process. Important, however, is that the result of the investigation is not known. This form of inquiry as Banchi and Bell gathered, involves developing a foundation for inquiry and critical skills in learners.

Guided inquiry contrasts with confirmation and structured inquiry. Learners are only given a question, the teacher expects them to design a method of investigation by themselves and test the question by themselves which makes it a bit unstructured. This form of inquiry according to Banchi & Bell allows learners to take ownership of an investigation and their findings. The danger in guided inquiry according to Brewer (2020) is that learners, due to the freedom and independent approach accorded them may choose to carry out projects in a different way or even projects outside their given responsibility. It is important therefore, for the teacher to provide appropriate guidance and feedback where necessary.

Lastly, Open inquiry is a form that truly engages learners and it is considered the highest level of inquiry based learning (Banchi & Bell, 2006). Gatt & Zammit (2017) sees this form of inquiry as one where learners form questions, design method (s) of investigation, carry out the inquiry and present their results at the end of the process. Brewer calls this form of inquiry free inquiry. The advantage it places over other forms of inquiry is that learners take good ownership over their learning process and development, including topic selection, questions, methods, and goals. However, the freedom given to learners to choose whichever idea they wish to research under the main umbrella topic may be abused.

This form of inquiry therefore, according to Brewer requires a lot of self-discipline by the learners and comfort with self-directed learning.

Whichever form of inquiry-based learning the teacher adopts is not the main issue, as each form complements the topic and objectives of learning. To Brewer (2020), what is nearly impossible to evaluate is creativity, critical thinking, inventiveness and exploration in IBL. To overcome this hurdle, as he suggests, the teacher must start by providing insights and feedback throughout the process. To achieve a better result, he further suggests the need for the teacher to challenge students to stretch more, that is, explore more opportunities, apply critical thinking skills in new ways, and explore potential challenges in new ways. Finally, the teacher must be prepared to credit students with how they grow and learn individually through the process, that is, reward meaningful engagements and efforts using reflection tools. Evaluating science based subjects may differ from the way English language is assessed. Brewer suggests key signs to look out for in evaluating a language to include:

appropriate use of vocabulary
ability to exchange ideas effectively and clearly
learners' ability to solve problems or present their topic in a way that is supported by explanation, insight and evidence. .

REQUIREMENTS FOR IMPLEMENTATION OF INQUIRY BASED LEARNING

Before implementing inquiry based instruction, Banchi & Bell (2006) listed some vital considerations to observe. First, IBL requires more interaction with students. Following their observation, Warner & Myers (2008) recognized the role of teachers in adapting inquiry based lessons, especially in terms of promoting student dialog. The teacher must open up and maintain communication line which among other things enables him to monitor students' investigations, their analysis and presentations. From Banchi & Bell and Warner & Myers submissions, effective and meaningful communication between the teacher and learners in the process of inquiry learning deepens learners' understanding of the topic and determines success and overall performance. The teacher who is a guide and facilitator must be ready to provide meaningful feedback, guidance, expertise and resources to promote successful learning experience. Again as they noted, assessing learners' research and analytical skills could be very challenging. To overcome the inherent challenges therefore, requires adequate planning and learners must be given sufficient time frame to determine their project, gather information and resources, execute their investigations, properly summarize and present their findings, especially level 4 inquiry (open inquiry). Lee (2014) raised adaptability of questions as another very important consideration of inquiry based teaching. The effectiveness of teaching and the development of students' linguistic capabilities as he

further stressed, are a function of the appropriateness of questions and the pattern of presentation. Lee claims that referential questions function more productively than display questions in terms of communication, and teachers should consider questions that deal with upper level cognition, for example, asking students to inductively derive grammatical rules or such assignments as asking students to provide solutions in the target language to situations encountered.

WRITTEN AND ORAL COMMUNICATION.

Research proves that IBL is an effective approach in promoting curiosity among learners, and actively engaging learners in deep analytical and critical thinking in science and science-related subjects (Krajcik et al, 1998; Dorier & Garci, 2013), however, this pedagogy is newly being empirically tested in second language teaching and learning. Although few previous research on inquiry in second language teaching are referenced (Ulfah 2012; Escalante 2013; Lee, 2014; Godbee 2016), there is limited research on the effects of inquiry-based writing instruction on students' oral and written communication.

Oral and written styles are two major possible ways human beings communicate and share ideas. Oral communication is just talking to others with the aim to share ideas, communicate thoughts, exchange information, give orders, persuade people and tender apologies. Written communication, however means communicating to others through written words which is possibly achieved through email, text messages, cards and letters, newspaper and magazines. In the workplace and even in everyday life, we have found ourselves exploring the styles of communication to get what we need done. It is expedient therefore that learners gain mastery in the two communication styles and that had made teachers to commit quality time to teaching them with much precision. Mastery in both styles makes learners more instrumental and more realistic for them. Part of the objectives of this study is to examine how inquiry-based approach can facilitate Nigeria students' oral and communication skills to support previous teaching approaches in second language classroom especially as it has been established that teaching second language put much stress on the enhancement of students' communication skills (Lee, 2014).

Few literature has reported correlation between IBL and academic performance, especially in second and foreign language classroom. Lee (2014) used a questionnaire instrument to assess Chinese students' feedback on the effectiveness and preference of inquiry-based instruction in a second language classroom. He was motivated by the claim that inquiry teaching is characterized by its question and answer interactive information exchanges. His study was premised on the assumption that inquiry is an active, discovery, or Socratic pedagogy which draws students' attention and reinforces meaningful communication. His finding reveals that students

expressed enthusiasm on inquiry based teaching and their understanding of the course material was reinforced. Moving away from learners' perception on inquiry-based instruction, Alwadi (2018) explored how inquiry-based teaching technique could be used to support EFL students' learning of theoretical English content using 19 students majoring in English education in the Bachelor programme at Bahrian Teachers' college, University of Bahrain. He used a pre-post questionnaire administered to students to identify their motivations towards both the English content-based course and inquiry-based teaching before and after application. Al-wadi's findings suggest positive impact of IBL on increasing the respondents' motivations towards their study course. This study is a deviation from previous works which consider inquiry as an approach that fosters practice than theory.

Finally and lately, Dellatoal, Daradoumis & Dimitriadis (2020) presented an experimental study where their respondents were divided into experimental and control groups to establish students' perceptions as to whether a collaborative, inquiry-based language learning activity in a flipped classroom had a positive effect on learning process. The experimental group (EG) was engaged with the four levels of pedagogy: behavioral, emotional, cognitive and relational (social) in inquiry-based approach while the control group (CG) only followed a collaborative learning approach in a conventional classroom environment. Their results revealed that EG students accomplished higher learning outcome concerning fluency and vocabulary range than CG. Their finding is in keeping with previous studies which see IBL as an approach that is characterized by academic rigour, that is, it requires that students engage in intellectually challenging tasks that need deep logical and critical thinking (Shanmugavelu, Parasuraman, Ariflin, Kannan, and Vadivelu (2020) Dellatoal et al's study further showed that EG students' behavioural, emotional, cognitive and social engagement was significantly increased comparatively than their counterparts (CG).

Although researchers listed above and more have found strong relationship between IBL and students' engagement in second language learning, especially in the area of vocabulary development and fluency, less is documented and known about how inquiry based learning can impact students' oral and written communication. These two styles of communication are fundamental to our achievements in other areas in our day to day life. To achieve this objective therefore, we would answer these following research questions:

1. What type of skill (s) does the learner acquire in IBL-implemented classroom that can facilitate second/foreign language development (oral and written communication)?
2. What disadvantage(s) or problem(s) is associated with IBL approach, from the learners' perception that can impede its implementation?

METHODOLOGY

This study's population (120 students) was drawn from Michael Okpara university of Agriculture students, Umudike, Nigeria who learnt the mandatory English language course. They were drawn from the college of natural and applied sciences and the five departments that participated in the study were departments of Biochemistry, Microbiology, plant science and Biotechnology, forestry and environmental management and zoology; students aged between 17 and 28 years yielding an average age of 22.5. The period of instruction lasted for two semesters and they were consciously and passionately taught using inquiry based approach. After a whole semester of thorough instruction, they were grouped in a manageable number (6 students per group), and given topics to research on, analyze and present to the entire class. The researchers engaged the students in guided inquiry where topics in a question form were assigned to them according to their areas of study and interest. In this form of inquiry, students were meant to device method (s) of investigating around their given topics. Prior to this project, they were managing assigned academic responsibilities in small group teams. Such exposure facilitated robust social exchanges among the students and boosted their self-confidence. Half into the first semester course, their engagements were tested with a pre-test assigned to the twenty small groups of six students each. We recorded their performance and by the end of the course, they were assigned a post-test of oral speech to write and present. All the groups were under close monitoring and supervision of the researchers to ensure maximum engagements of all group members. The content, expression, coherency and mechanical accuracy of the speeches were evaluated and scores of the pre- and post-tests were compared. After the group speech writing and oral presentations, the participants were asked to write their experiences of investigating, analyzing and presenting their works to the entire class in small groups. The content analyses of their experiences were finally assessed. Out of the twenty groups that participated in this inquiry, we selected ten groups that scored low and ten other groups that scored high and their performances presented in the table below.

FINDINGS

Table 1. Scores of the pretest and posttest of 10 groups who scored low.

Pre-Test Participants	C 20mks	E 10mks	Coh 10mks	M/A 10mks	Posttest	C 20mks	E 10mks	Coh 10mks	M/A 10mks
Group 1	8	2	3	2		16	8	8	6
Group 2	7	2	3	2		15	8	8	7
Group 3	7	2	3	2		16	8	8	5
Group 4	7	2	2	3		16	7	7	6
Group 5	6	3	2	3		15	8	7	6
Group 6	6	4	2	2		16	8	8	5
Group 7	6	4	3	3		16	7	7	6
Group 8	6	4	3	2		16	8	7	6
Group 9	5	3	3	3		15	8	8	6
Group 10	5	3	3	3		17	8	7	5

Where C= Content

E = Expression

Coh =Coherency

M/A =Mechanical accuracy

The table above reveals that group 10 that scored 11/50 in the pre-test when they were not actively engaged and fully integrated into inquiry instruction had their scores improved by 52% (36/50). Group 5 scored 14/50 in the pre-test and 36/50 in the post test achieving a percentage increase of 44%. Lastly, group 1 which 15/50 in the pre-test scored 38/50 with an improved score of 46%.

Table 2: Scores of the pre-test and post-test of 10 groups that scored high.

Pre-test Participants	Pre-test				Post-test participants	Post-test			
	C 20mks	E 10mks	Coh 10mks	M/A		C 20mks	E 10mks	Coh 10mks	M/A 10mks
Group 1	10	5	6	4	1	16	8	8	7
Group 2.	11	6	6	4	2	17	8	8	7
Group 3.	10	7	6	5	3	17	7	8	7
Group 4.	11	7	7	5	4	17	8	7	7
5	11	7	7	6	5	17	8	8	8
6	11	7	8	6	6	17	8	7	8
7	10	8	8	6	7	17	8	8	7
8	11	8	7	7	8	16	8	8	8
9	10	8	8	7	9	17	8	8	8
10	11	8	8	7	10	18	8	8	8

Table 2 shows a 28% increase in the posttest of group 1 of those who scored high (25/50 to 39/50), 20% for group 5 (31/50 to 41/50) and finally, 16% for group 10 (34/50 to 42/50)

Table 3 Students' Content Perception of inquiry based learning.

Question: What were your experiences of cooperative work during your speech writing?

Perception	Yes	No	Total
active participation	80%	20%	100%
deep content knowledge	75%	25%	100%
Promotes curiosity	70%	30%	100%
strong interpersonal oral and written communication	60%	40%	100%
classroom relationships	60%	40%	100%
Disadvantage	20%	80%	100%

Table reveals active participation in English classroom as being associated with inquiry based learning with a high percentage of 80 as against only 20% who responded on the contrary. Other skills associated with IBL are deep content knowledge (75%), promotes curiosity (70%), strong interpersonal oral and written communication (60%) and classroom relationships (60%). Only a negligible few saw disadvantage in IBL (20%).

DISCUSSION

In this systematic investigation, participants were engaged in small groups' inquiry learning to determine the effects of inquiry approach on their oral and written communication skills. They were assigned topics to investigate on, analyze and present to a large audience. Their performance (pre-test scores) at the beginning of the integration of IBL was compared side by side with their post-test administered at the end of the approach to establish improvements or significance in their post-test scores as a way determine the impact of IBL on their oral and written communication. The findings as revealed on Tables 1 and 2 showed there were frontiers in the pre-test and post-test scores of both the low scorers (weak) and high scorers (proficient students). The groups that scored below average-mark using assessment parameters (Content, Expression, Coherency, and Mechanical Accuracy) scored above average mark after actively engaging them in inquiry instruction. Table 2 reveals that IBL also benefits intelligent (high scoring) students as there were significant differences found in their post-test after integrating IBL instruction. The findings illustrated that IBL was related to aptitude which, in turn, interfaced L2 achievements. The results showed that IBL is one of the pathways to build team spirit which engenders content development required for L2 achievements among learners. This finding agrees with Sowundo & Wulandari (2013) who studied 96 training teachers enrolled in biology programme in the University of Riau, Indonesia who were divided into two groups. The purpose of their study was to identify the effect of using active inquiry-based learning in conducting experiment in the subject of Biostatic. The students were administered a test after each topic they learnt to establish their level of understanding of the content of the subject. They also administered a questionnaire which focused on attitude from peers' perspectives. Their findings show that attitude of the students changed after using inquiry-based learning. In addition, the achievements of the majority of the students from the two groups in 2011 and 2012 were at good level. Their results suggest that IBL can be used to increase students' achievement and change their style of learning especially in conducting experiments. Sowundo & Wulandari's study is a proof that IBL is not an approach that benefits language learners only; it also improves science learners' achievements and attitude.

This study's findings support a recent study by Irawan et al (2019) which aimed to improve critical thinking and student attitudes of elementary school teacher education students with inquiry-based learning model assisted the ethno-constructivism module against the traditional printed teaching materials used in lectures. They used the experimental quantitative design where the sample was selected using their purposive sampling technique with 68 participants divided into experimental group (n=34)

(those taught using IBL model) and control group (n-34), taught using traditional teaching materials. Their data was analyzed using SPSS 21 application to achieve descriptive statistics in the form of mean, min, max, and categories and inferential statistics for independent sample test (t-test). Their findings revealed that the experimental group had superior critical thinking skills and attitude towards learning cultural values when compared with their counterparts (control group). Their study suggests that IBL assisted by ethno-constructivism module is proven to be an effective method to encourage critical thinking and positive attitude among elementary school teacher education students. Syahrial et al's study reveals another area of IBL impact: attitude and critical thinking. These are the major variables impacting second language development among EFL/ ESL learners. We could not see any empirical study whose findings were at variance with the present study results. This could be that many classrooms are yet to integrate this cognitive and communicative competence approach in their language teaching. Hopefully, in the near future, such works would be found in the extant literature.

Using content analysis (Mayring, 1999) to analyze Table 3 which assessed students' perception on IBL, active participation, deep content knowledge, curiosity, strong interpersonal oral and written communication, and classroom relationships were associated with inquiry based learning. The answers provided by the respondents which pointed to active participation include: everyone was involved, we brainstormed on the topic, triggers hard work, team work, members brought their answers, etc. Answers like 'enhanced understanding of some questions, explanation of difficult/abstract concepts, serious study, and we investigated the topic' focused on deep content knowledge. Responses like 'was interesting, we wanted to earn high score, I didn't want to be left out, it was fun, etc focused on curiosity. The comments by respondents that supported strong interpersonal oral and written communication include: I practiced the speech over and over again before the day of presentation, we presented to one another after writing, each member proofread the work, we shared our ideas together, etc. Table 3 further reveals that a minimum number of people expressed dissatisfaction on the approach. Their responses which buttressed disadvantage or problem of IBL include: I was afraid of expressing myself before a large audience, it was too demanding and I forgot what I knew on the stage. Table 3 also shows the percentage of respondents who shared positive experiences and outcome of IBL approach and greatly benefited from it as more significant (80%), than those who abstracted the value (20%).

The study which evaluated the effects of inquiry based learning (IBL) on Nigeria students' oral and written communication skills using one hundred and twenty (120) first year undergraduate students of Michael

Okpara University of Agriculture, Umudike, Nigeria reveals that IBL promotes active participation, enhances deep content knowledge, curiosity, strong interpersonal oral and written communication, and classroom relationships amidst the fact that it creates initial untold fear among students from their perception. The results therefore suggest IBL as a cognitive and language learning enhanced- approach that should replace the traditional lecture method as found in most ESI/EFL classrooms. .

CONCLUSION

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