Assessing Lecturers' Readiness to Teach 21st Century Skills in Colleges of Education in Imo State

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Abstract: Digital transformation has heavily impacted the education industry at all levels of education. Teaching patterns in institutions are changing because of the interest in students acquiring 21st-century skills. Lecturers play an important role in this endeavour and therefore, this study focused on their understanding of the 21st century skills and the teaching approaches required to imbibe them. This is in addition to how they implement teaching in their classrooms for their attainment. The study employed a survey research design. A sample size of 180 lecturers was randomly selected from a population of 986 lecturers from two colleges of education in Imo State. A questionnaire of the 4-point Likert scale was developed for the collection of data for the study. [1]The instrument is composed of four sections with the first focusing on the institution, understanding 21st century skills, the development and implementation of different teaching methods for teaching the 21st Century skills and the use of technological tools for learning in the classroom. The instrument was subjected to face and content validation by three experts in measurement and evaluation. It was administered on 20 lectures from an institution not used in the study to determine the reliability estimate using Cronbach-alpha and a reliability coefficient of 0.78 was obtained. Data were analyzed using mean and percentages. The findings revealed among others that lectures in colleges of education use methods that promote the actualization of 21st-century educational goals. Based on the results, it was recommended among others that colleges of education management should organize specialized programmes to further familiarize lecturers with the importance of 21st-century skills and how they could effectively teach them to learners

Keywords: 21" century Skills, Communication, Collaboration, Critical thinking, Creativity, Technology Use

How to Cite

Introduction

We live in a fast-changing world and the 21st Century Skills have become very important for survival hence lecturers must expose their students to them (Nold, 2009). According to Pollard (2007), in the learning of 21st-century skills focus should be on skills among which are communication, critical thinking, collaboration and creativity (4Cs). Claw et al. (2018) indicated that to inculcate these skills to students, teachers are required to be technologically educated. Carlgen (2011) opines that with a better understanding of 21st-century skills, teachers would teach effectively as understanding influences how a teacher acts, makes decisions, teaches and applies teaching practices. According to Rosli (2017), the process of learning 21st-century skills should be based on four main principles, pupils-centeredness, collaborative learning, contextual learning and integrating with communities. That is why Amin (2016) indicated that teachers are required to be collaborators, mediators, open-minded, critical and technologically oriented. To do this, teachers have to be ready and understand what the 21st Century skills entail so that they can effectively provide the much-required knowledge to the students (Carigen, 2013)

The 4Cs are by far the most popular 21st Century skills. These skills also called learning skills, are universal across careers though they could vary in terms of importance based on the individual career aspiration. Critical thinking involves the ability to apply rationality to understand the logical connection between ideas. With critical thinking, students don't just learn a set of facts or figures, instead, they learn how to discover the facts and figures for themselves (Bowen, 2018). Students need proficiency in their critical thinking skills to make analytical decisions on what to accept and what procedure to utilize. To aid learners in developing these skills lecturers must awaken students' intellectual desire to learn in the classroom by asking students to assess their own opinions and evaluating them in the light of different opinions and available evidence.

Creativity skills empower students to see concepts from different perspectives which leads to innovation. It is the ability to think about a task or problem in a new or different way. Students' learning of creativity as a skill in contemporary times requires them to understand that knowledge is not static. The addition of words like "create", "design", "invent", "imagine", and "suppose" to class assignments can increase the creative performance of students. However, teaching students to be creative thinkers can be difficult but with problem-solving exposure the students can imbibe creative skills as part of learning and teaching in any discipline.

Arranging students to work together in groups to accomplish a particular goal is Collaboration. Teaching collaboration skills in the classroom could involve group projects. Fadel (2010) opines that collaborative learning is the educational approach of using groups to enhance learning through working together. In this approach, groups of two or more students work together to solve problems, complete tasks or learn new concepts. Thus, students should be involved in learning activities that encourage collaborative learning in schools. While group work can help teach and reinforce collaboration and teamwork, addressing these skills in daily lessons can make them stick in the learners' cognitive repertoire.

Communication is the practice of conveying ideas by using a variety of methods. Effective communication is important for the attainment of educational outcomes. Communication skills involve abilities in listening, speaking, observing and emphasizing. Consequently, teaching communication skills requires exposure to multiple facets of communication including listening skills, verbal communication, written communication and collaborative communication. These skills enable students to receive and provide various kinds of information in whatever situation they find themselves. According to Carlgen (2011) teachers who communicate better produce students with better grades and retention rates while higher dropout rates are partially attributable to poor classroom communication. Thus, when students acquire good communication skills, their performance in the

world of work is expected to be outstanding and an absence of these skills may make it difficult to advance their careers (Amin, 2016). To effectively do this, teaching through lecture and discussion alone will not suffice; innovative approaches have to be used also. The need for schools to prepare students for jobs that have not been created, technology that has not yet been invented and problems that we don't yet know will arise (Bulletin, 2015) and this requires good communication skills. A more technologically oriented approach in this effort should yield the desired results. According to Rahum (2017), 21st-century skills require the transformation of classroom strategies and curriculum to shape students to deal with the demands of the evolving world. Technology is important in this regard.

The 21st Century according to Bernie & Charles (2010) requires a range of competencies that include the 4Cs that are anticipated to be taught across all levels of education. In this way, the students acquire the skills they require to navigate an ever-shifting work environment. It is therefore no wonder that the pattern of teaching in institutions is expected to shift to involve collaborative learning, the use of ICT tools and focusing on critical thinking and problem-solving (Chai, 2017). This is an innovation and according to Silva (2009), learners exposed this way would constitute a workforce that are independent thinkers, problem solvers and good decision-makers. According to the Organization for Economic Co-operation and Development (OECD) through learning these contemporary skills students can "practice in-depth knowledge to an increasingly expanding scope of circumstances, and experience gaining new capabilities, relationships and accepting new roles" (2019).

Nigeria has to keep pace with these developments in her schools and there is therefore need to integrate 21st-century skills in the curriculum of colleges of education which produce teachers. This is an aspect of curriculum restructuring which according to Fadel (2010) should embrace all aspects of skills, competencies and abilities that should work towards meeting the requirements of attaining the 21st Century skills. Lecturers in colleges of education should understand these skills and should have the necessary technology literacy, a desideratum for technology use. Technology literacy involves the use of tools such as electronic whiteboards, electronic calendars, interaction with webpages, teleconferencing etc.

Based on the importance of technology use in teaching the 21st Century skills otherwise called the 4Cs, the lecturers' understanding of the skills needs to be examined. This is in addition to their pedagogical knowledge to inculcate the skills to the students. This is important as the lecturers are expected to align technologies with content and pedagogy.

Specifically, the following research questions guided the study:

1.   What is the understanding of lecturers in colleges of education in Imo state of the 21"
Century Skills and their imperatives?

2.   What approaches are used by lecturers in colleges of education in teaching the different
21st century skills.

3.   How is technology used by lecturers in colleges of education in Imo state in teaching the
21st century skills?

Methodology

A descriptive survey approach was used for the study. The population comprised nine hundred and eighty-six (986) academic staff of two colleges of education (Alvan lkoku College of Education, Owerri and Imo State College of Education) in Imo State The two institutions were purposely selected from the five higher institutions

in the state and ninety lecturers were selected from each of the institutions giving a sample size of one hundred and eighty (180) lecturers for the study.

The instrument used to collect data was a questionnaire constructed by the researchers and titled "Lecturers Readiness For 21st Century Education Questionnaire" ("LR21"CEQ"). The instrument consisted of 4 sections A, B, C, and D with a total of 38 items. Section A requested the institution of the respondents which includes their age and marital status. Section B focused on the lecturer's understanding of the 21" Century skills. The section utilized 4-point Likert Scale response categories of Strongly Agree, Agree, Disagree, and Strongly disagree. Section C focused on the development and implementation of different teaching methods of 21st-century skills in the classroom. Section D focused on the use of technological tools for learning in the classroom. The response options assigned to Sections C and D were Almost daily, 1-3 times a week, 1-3 times a month, and a few times in a semester.

The instrument was validated by three experts in the area of measurement and evaluation, and it was administered to twenty lecturers from a college of education not used for the study. The reliability using Cronbach alpha was 0.78 indicating the consistency of the scores from the instrument.

The questionnaire was administered by the researchers to one hundred and eighty (180) lecturers in the two institutions. For purposes of data analysis Strongly Agree, Agree, Disagree and Strongly disagree were scored as 4, 3, 2, and 1 respectively. Almost daily, 1-3 times a week, 1-3 times a month, and a few times in a semester were scored as 4, 3, 2, and 1 respectively. An interpretative norm of 2.5 was generated for items in sections B, C and D such that a means of 2.5 and above-indicated agreement with the items. The data collected were analyzed using mean, percentages and standard deviation.

Results

The results are presented based on the research questions posed.

Lecturers' understanding of the 21st Century skills and their imperatives

In Table 1, the frequencies of agree (agree and strongly agree) range from 'I can evaluate 21st Century skills among the students' (19.1%) to 'I need professional development in assessing 21st Century skills of students' (71.3 %). These are complementary items as few lecturers can evaluate and many of them require professional development. Using the interpretative norm of 2.5, the items that are true concerning the lecturers are 'Technology plays an important role in 21st Century skills learning' (58.1%), 'I need professional development in assessing 21st Century skills of students' (74.3%), 'I need professional development to increase my knowledge about 21st Century skills'(55.6%) '21st Century skills are important in determining students' success at workplace in the future' (50%). Each of these items has a mean greater or equal to 2.5. On the other hand, the lecturers did not agree with items such as 'I have excellent knowledge of the 21st Century skills' ($\bar{X}$=2.01), 'I am confident in using technology as a tool for learning 21st Century skills learning' ($\bar{X}$ =2.24), and 'The curriculum promotes 21st Century skills learning' ($\bar{X}$ =2.25).

Table 1

Descriptive statistics of lectures' understanding of 21st Century skills and their imperatives

Item	Strongly Agree	Agree	Disagree	Strongly disagree	Mean	Remark
	F (%)	F (%)	F (%)	F (%)		
I have excellent knowledge of the 21st Century skills	12 (6.7)	49 (27.5)	60 (33.7)	57 (32.0)	2.01	Reject
I am confident in using technology as a tool for learning 21st-century skills	26 (14.6)	52 (29.2)	40 (22.5)	60 (33.7)	2.25	Reject
Technology plays an important role in 21st Century skills learning	59 (33.1)	45 (25.3)	30 (16.9)	44 (24.7)	2.7	Accept
21st Century skills are important in determining students' success in the workplace in the future.	33 (19.7)	54 (30.3)	59 (33.1)	30 (16.9)	2.6	Accept
The curriculum promotes 21st Century skills learning	26 (14.6)	52 (29.2)	40 (22.5)	60 (33.7)	2.25	Reject
I need professional development to increase my knowledge of 21st Century skills	59 (33.1)	40 (22.5)	35 (19.7)	44 (24.7)	2.6.	Accept
I need professional development in assessing 21st Century skills of students	60 (33.7)	67 (37.6)	20 (11.2)	31 (17.4)	2.9	Accept
I can evaluate 21st Century skills among the students	14 (7.9)	20 (11.2)	49 (27.5)	95 (53.4)	1.7	Reject

Methods used by the lecturers in colleges of education in Imo state to teach the different skills

To actualize the attainment of the skills required in the 21st Century, appropriate methods have to be applied. Examination of the methods used by the lecturers are now presented in Table 2 containing the descriptive

statistics for the methods used in teaching critical thinking skills. The methods utilized include 'Compare information from different sources before completing a task or assignment' ($\bar{X}$ =2.5), 'Summarize or create their interpretation of what has been taught' ($\bar{X}$ =2.9), 'Analyze argument, perspectives or solution to a problem'($\bar{X}$ =2.8) and 'Draw their conclusion based on analysis of numbers, facts or relevant information' ($\bar{X}$ =2.6). Methods not used by the lecturers include 'Develop a persuasive argument based on supporting evidence or reasoning' ($\bar{X}$ =2.3) and 'Try to solve complex problems or answer questions that have no single correct solution or answers' ($\bar{X}$ =2.4).

Table 2
Descriptive statistics of methods used by lectures in teaching critical thinking

Item	Almost daily	1-3 times a week	1-3 times 9 months	A few times 9 Semester	Mean	Remark
	F (%)	F (%)	F (%)	F (%)		
Compare information from different sources before completing a task or assignment	30 (16.9)	53 (29.8)	75 (42.1)	20 (11.2)	2.5	Accept
Summarize or create their interpretation of what has been taught	70 (39.3)	49 (27.5)	23 (12.9)	36 (20.2)	2.9	Accept
Analyze arguments, perspectives or solutions to a problem	54 (30.3)	74 (41.6)	23 (12.9)	27 (15.2)	2.8	Accept
Draw their conclusions based on analysis of numbers, facts or relevant information	40 (22.5)	50 (28.1)	75 (42.1)	13 (7.3)	2.6	Accept
Develop a persuasive argument based on supporting evidence or reasoning	12 (6.8)	49 (27.5)	60 (33.7)	57 (32.0)	2.3	Reject
Try to solve complex problems or answer questions that have no single correct solution or answers.	24 (13.5)	51 (28.7)	75 (42.1)	28 (15.7)	2.4	Reject
Summarize or create their interpretation of what has been taught	70 (39.3)	49 (27.5)	23 (12.9)	36 (20.2)	2.9	Accept

In Table 3, the items selected by more than 60% for 1-3 times a week or almost daily include 'Structure data for use in writing products or oral presentation (e.g. creating charts, tables and graphs)' (46.7%), 'Prepare and deliver oral presentation to the lecturers or others' (78.1%) and 'Answer questions in front of an audience' (73.0%) and 'Decide how they will present their work or demonstrate their learning' (70.2%). All these methods were accepted as being used by the lecturers. The item with the lowest number of respondents based on this criterion is 'Convey their idea using media other than a written paper (e.g. poster, video, blog etc.) (34.2%).

Table 3
Descriptive statistics of methods used to teach communication skills lecturers

Item	Almost daily	1-3 times a week	1-3 times 9 months	A few times 9 Semester	Mean	Remark
	F (%)	F (%)	F (%)	F (%)		
Structure data for use in written products or oral presentations (e.g. creating charts, tables and graphs)	70 (39.3)	47 (26.4)	25 (14.1)	36 (20.2)	2.8	Accept
Prepare and deliver oral presentations to the lecturers or others	77 (43.3)	62 (34.8)	19 (10.7)	20 (11.2)	3.1	Accept
Answer questions in front of an audience	63 (35.4)	67 (37.6)	19 (10.7)	30 (16.9)	3.0	Accept
Convey their ideas using media other than a written paper (e.g. poster, video, blog etc.)	12 (6.7)	49 (27.5)	60 (33.7)	57 (32.0)	2.3	Reject
Decide how they will present their work or demonstrate their learning	71 (39.9)	54 (30.3)	25 (14.1)	28 (15.7)	2.9	Accept

In Table 4, the only item selected by 50% or more for 1-3 times a week or almost daily is 'Use idea creative technique such as brainstorming or concept mapping' (72.4% with a mean of 2.8). Thus, that is the only teaching method used for teaching creativity and innovation skills. Methods not used based on the interpretative norm of 2.5 include 'Test out a different idea and work to improve them' ($\bar{X}$ =2.2), 'Generate their ideas about how to confront a problem or question' (2.1%), 'Invent a solution to a complex open-ended question or problem' ($\bar{X}$ =2.4) and 'Create an original product or performance to express their ideas' ($\bar{X}$=2.2).

Table 4:

Descriptive statistics of the method of teaching creativity and innovation skills for learning

Item	**Almost daily**	**1-3 times a week**	**1-3 times 9 months**	**A few times 9 Semester**	Mean	**Remark**
	F (%)	F (%)	F (%)	F (%)		
Use idea-creation techniques such as brainstorming or concept mapping	62 (34.8)	67 (37.6)	21 (11.8)	28 (15.7)	2.8	Accept
Test out different ideas and work to improve them	26 (14.6)	52 (29.2)	40 (22.5)	60 (33.7)	2.2	Reject
Generate their ideas about how to confront a problem or question	29 (16.3)	36 (20.2)	52 (29.2)	61 (34.3)	2.1	Reject
Invent a solution to a complex open-ended question or problem	44 (24.7)	35 (19.7)	40 (22.5)	59 (33.1)	2.4	Reject
Create an original product or performance to express their ideas	31 (17.4)	32 (18.0)	55 (30.9)	60 (33.7)	2.2	Reject

In Table 5, the methods used 1-3 times a week and almost daily were used by between 56.1% (create joint products using contributions from each student) and 79.7 (Work in pairs or small groups to complete a task together). The methods used most based on the criterion mean are 'Work in pairs or small groups to complete a task together' ($\bar{X}$ = 3.2) and 'Present their group work to the class lecturers or others' ($\bar{X}$ = 3.1). The least rated methods were 'Create joint products using contributions from each student' (x=2.6) and 'Work with other students to set goals and create a plan for their team' ($\bar{X}$ = 2.8).

Table 5

Descriptive statistics of methods used in teaching collaboration skills for learning

Item	Almost daily	1-3 times a week	1-3 times 9 months	A few times 9 Semester	Mean	Remark
	F (%)	F (%)	F (%)	F (%)		
Work in pairs or small groups to complete a task together	80 (44.9)	62 (34.8)	22 (12.4)	14 (7.9)	3.2	Accept
Create joint products using contributions from each student	59 (33.1)	41 (23.0)	34 (19.1)	44 (24.7)	2.6	Accept
Present their group work to the class lecturers or others	77 (43.2)	62 (35.9)	19 (10.7)	20 (11.2)	3.1	Accept
Work as a team to incorporate feedback or group tasks or products	62 (34.8)	67 (37.6)	19 (10.7)	30 (16.9)	3.0	Reject
Work with other students to set goals and create plans for their team	62 (34.8)	67 (37.6)	21 (11.8)	28 (15.7)	2.8	Accept
Give feedback to peers or assess other student work	72 (40.4)	56 (31.5)	32 (18.0)	18 (10.1)	3.0	Accept

Technology use in teaching by lecturers in the 21st-century classroom

Table 6 shows the low usage of technology as a tool for learning in the 21st-century classroom by lecturers. What was however used by most lecturers was 'Use technology to interact directly with experts or members of local/global communities '($\bar{X}$ =2.3), 'Use technology to keep track of the work in extended tasks or assignments' ($\bar{X}$ =2.2) and 'Evaluate the credibility and relevance of online resources' ($\bar{X}$ =2.2)

Table 6
Descriptive analysis of lecturers' use of technology for learning

Item	Almost daily	1-3 times a week	1-3 times 9 months	A few times 9 Semester	Mean	Remark
	F (%)	F (%)	F (%)	F (%)		
Use technology or internet for self-instruction (e.g. videos, tutorials, self-instructional websites)	17 (9.6)	29 (16.3)	60 (33.1)	74 (41.0)	2.0	Reject
Select appropriate technology tools or resources for completing a task	18 (10.1)	35 (19.7)	55 (30.9)	70 (39.3)	2.1	Reject
Use technology to support teamwork or collaboration (e.g. shared workspaces, e-mail exchanges, giving and receiving feedback)	16 (9.0)	18 (10.1)	46 (25.8)	98 (55.1)	1.8	Reject
Use technology to keep track of the work on extended tasks or assignments	26 (14.6)	52 (29.2)	40 (22.5)	60 (33.7)	2.2	Reject
Use technology to interact directly with experts or members of local /global communities	12 (6.8)	49 (27.5)	60 (33.7)	57 (32.0)	2.3	Reject
Evaluate the credibility and relevance of online resources	29 (16.3)	36 (20.2)	52 (29.2)	61 (34.3)	2.2	Reject
Use technology to help them share information	12 (6.8)	47 (26.4)	60 (33.7)	59 (33.1)	2.1	Reject

(e.g. multimedia presentations using sound or video presentation software, blogs, podcast					
Use technology to analyze information (e.g. database, spreadsheets, graphics)	14 (7.9)	20 (11.2)	49 (27.5)	95 (53.4)	1.7	Reject

Discussion

The results from the study revealed that lecturers in these institutions have a low but not good understanding of 21st-century skills and their pedagogical approach. Carlgen (2011) had found similar results. Education is dynamic and so those who teach within it must be familiar with emergent changes, Teachers taught based on old curricula may generally not be comfortable managing 21st-century skills acquisition. Thus, they need professional development to improve their understanding, as it influences how a teacher acts, makes decisions and applies teaching practices. Though most respondents agreed that 21st-century skills are important for the student's future success in the workplace, lecturers must be in tune to direct what is happening in the classrooms. This is in tandem with the opinion of Bernie and Charles (2010) that 21st-century skills give students the skills they need to navigate an ever-shifting workforce. The lecturers agreed that they need professional development to increase their knowledge and understanding of 21st-century skills. Yoke (2018) had earlier emphasized the need for professional transformation to take place among the lecturers to enable them to inculcate in the students the 21st Century skills.

Four skills (critical thinking, collaboration, creativity and communication) were considered in this study in addition to the use of technology as a tool for learning The results revealed that in developing students' critical thinking skills, the lecturers attempted to address critical thinking skills in their teaching. The most common approach used was for students to create their interpretation of what they have been taught. The least common approach used was to "develop a persuasive argument based on supporting evidence or reasoning." The fact that the most regular approach used by lecturers in these higher institutions is to ask the students to "answer questions in front of the audience" and then "prepare and deliver an oral presentation to the lecturers or others" is indicative that communication skills are regularly addressed by these lecturers.

The findings showed the most common approach to teaching as "to generate their ideas towards a particular problem and creating brainstorming or concept mapping technique". All other approaches considered in this study were also employed. The need to regularly impart creativity and innovation was also addressed by the lecturers despite the need to complete the syllabus based on time. Collaboration skills were also commonly addressed by the lecturers. The most preferred approach is requesting students to "work either in pairs or small groups to complete a task" They were also asked to do presentations as well as provide feedback.

The use of technology as a tools was not frequently applied as it should be by lecturers in these institutions. The expectation is that the use of technology should be emphasized more as we are in the technological era. This is more so as Howland et al. (2012) indicated that technology would allow for meaningful learning for all other

21st-century skills. This is also in agreement with Trilling (2009) who opined that lecturers need to equip themselves as well as learn various types of digital tools to meet the learning preferences of the millennial students. Lecturers in these institutions were good at creating learning activities that promote collaboration, problem-solving and critical thinking but not very good at promoting creativity and innovation. This finding is in agreement with research carried out by Osman and Basar (2016). Teachers face the most challenges in fostering innovation and creativity compared to other skills. Overall, none of the five skills were neglected in the teaching and learning approaches except in the area of the use of technology as a tools for teaching. It should be noted that the skills utilized in the classroom are however intertwined. When lecturers engage their students in one skill, other skills are also addressed in thought to varying degrees.

Acknowledging that technology plays an important role in the learning of 21st Century skills is in line with Claw et al. (2018) who is of the view that teachers should be technologically educated and equipped as it is very important to empower them to plan their teaching effectively. The lecturers agreed that using technology in this modern time is vital as search engines and e-books are gradually replacing textbooks. According to Yoke (2018), students in the 21st Century are now referred to as internet-age students who are multitasked and have chosen to engage themselves in active learning which involves technologies rather than only note-taking from lecture method. The implication is that students can now engage themselves in educational videos anytime and anywhere instead of hiring personal teachers for help. This supports Nold (2009) who indicated that students use technologies in all aspects of their lives, within the classroom and outside making learning more fun and exciting.

Conclusion and Recommendations

Higher institutions contribute to human capital for future development. A conclusion emergent from the study, within the limitation of respondents being sampled conveniently, is that 21st-century learning skills were perceived as important, and some effort was being made to teach these skills. Furthermore, the technology used in teaching these skills was limited. It is therefore recommended that tertiary-level education administration should organize a specialized programme to further familiarize lecturers with the importance of 21st-century skills among its lecturers. This should also involve the development of a comprehensive plan for preparing lecturers to integrate technology fully and effectively into the curriculum. Furthermore, both pre-service and in-service teacher training programmes should prepare teachers for digital curriculum implementation.

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