Assessing Teacher-Trainees' Perceptions Regarding the Online teaching-learning mode of the Agricultural Science Course

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ABSTRACT

The purpose of this study is to examine teacher-trainees' perceptions regarding the Online teaching-learning mode of the Agricultural Science Course. Quantitative descriptive research design was employed. The population for this study consists of second year (level 200) students (teacher-trainees) in the Colleges of Education in Ghana. The sample of the study involved the level 200 teacher-trainees offering Agricultural Science as an elective course. Purposive sampling was adopted to select the study sample. The sample size was made up of 45 teacher-trainees offering the Agricultural Science as an elective course. A self-designed questionnaire was used to collect data online from the respondents. The piloted test of the instrument attained the reliability alpha values of 0.82 and 0.78 on two constructs with Likert Scales. The findings revealed that the Online teaching-learning significantly impacted positively on the students' learning with an average rate of 64.8% frequency. A greater number of respondents of about 80.4% averagely admitted to have had challenges with the Online teaching-learning. The findings also revealed that the students' preferred learning modes of the Agricultural Science course are the face-to-face and the hybrid. In an effort to embrace the integration of face-to-face and the online teaching-learning in the Colleges of

Education, the study recommends: the organization of professional development for Tutors on the use of ICT tools for Online instructional deliveries, the Colleges of Education curriculum developers are to make pre-requisite courses in ICT available for all students, the College Management and the relevant stakeholders to improve the Internet facilities in the Colleges, and the College Management and the relevant stakeholders to embrace the Common Learning Management System (LMS) in the Colleges.

Key words: *Agricultural Science, online teaching-learning, teacher-trainees, hybrid, face-to-face.*

1.0 Introduction

The physical "bricks and mortar" classroom is starting to lose its monopoly as the place to teach (Nguyen, 2015, p. 309). Indeed the advent of technology has brought a great change in human endeavour. In the Educational Institutions, the age long mode of instructional activities where the instructor is seen as the only one in the center of affairs is gradually dying out. Most educational institutions have resorted to Online teaching-learning to supplement the traditional teaching-learning mode. The Online teaching-learning also commonly known as the E-learning or the Web-based learning in some cases, is characterized by the use of internet and the World Wide Web and other technologies in a virtual environment. Online learning is a technology-based learning. It includes computer-based and web-based technologies (Tsai & Machado, 2002).

Over the years, there have been series of studies among scholars to assess the impact and the effectiveness of E-learning. As some studies revealed, Online teaching-learning has significant positive influence on students' learning. Others revealed that there is no significant differences between the Online teaching-learning and the face-to-face teaching-learning. The empirical Literature meta-analysis on the 'effectiveness of Online and Blended Learning' revealed that "averagely, students in Online learning conditions performed modestly better than those receiving face-to-face instruction" (Means, Toyama, Murphy & Bakia, 2013, p.1). The study of Alston, and English (2007) on evaluating the effectiveness of Web-enhanced Agricultural education pedagogy, also revealed largely that respondents agreed there were many benefits to Web-enhanced courses and they perceived all Web site components under study to be very useful. The study of Arnone (2002) accounts that some learners found the E-learning to suit their learning styles better than conventional (face-to-face) options. This could be attributed to the fact that some learners are more visual than auditory.

Johnson, Aragon, Shaik and Plama (2000) compared the performance of students enrolled in an online graduate course with that of students taking the same course taught in a traditional classroom. The results indicated that there were no significant differences between the two courses. In the same vein, Fallah and Ubell (2000) compared midterm exam scores between Online and traditional students and found little or no difference in students' outcomes.

No matter how the Online learning may be viewed, one thing that is clear is: it is a learning mode that has stabilized itself to augment the conventional instructional mode. In Ghana, not until the advent of the COVID-19, teaching-learning in the institutions were purely conventional. In order to complete students' course outlines and to pave ways for students' academic progressions, classrooms' activities turned to be virtually implemented at the second half of the 2019/2020 academic year. E-learning though not a new teaching-learning mode to many, especially most of the academic institutions in the developed nations, we can attest to the fact that it has appeared to be a new trend adopted in Ghana's educational institutions.

The Online teaching-learning mode of Agricultural Science course in the Colleges of Education in Ghana, is the key component of this current study. The authors, Alston and English (2007) are of the view that in order for Agricultural education to remain feasible, educators should emulate the best existing programmes while exploring new ways of delivering Agricultural education. It is specified in the study of Murphy and Terry (1998) that the opportunities are numerous for Agricultural educators to utilize instructional technology in their daily task.

The Encyclopedia Britannica (2019), defines Agricultural Sciences as "sciences dealing with food and fibre production and processing. These include: the technologies of soil cultivation, crop cultivation and harvesting, animal production, and the processing of plant and animal products for human consumption and use."

Agricultural Science is one of the elective courses for the teacher-trainees in the Colleges of Education in Ghana. The study of the Agricultural Science in the Colleges is aimed at equipping the teacher-trainees with pedagogical and content knowledge skills requisite enough to enable them teach the aspects in the Integrated Science effectively in the Basic Schools where they are trained for. The course structure comprises both the practical work on the field and the classroom content and pedagogical aspects. The Agricultural Science course, in spite of being viewed as more of practical course, had also been delivered Online in the Colleges.

The Online teaching-learning in Ghana being a trending issue, it is agreeable that there had already been a number of empirical researches available for educators. For example, the study of Tsitsia, Kabbah, Kabe, Doyi and Safo (2020), investigated "students' perceptions on E-learning in the Colleges of Education". Aheto-Domi, Issah and Dorleku (2020) also investigated "the virtual learning and readiness of Tutors of Colleges of Education in Ghana". A related study on the "teacher-trainees' preferred mode of learning Mathematics education in the Colleges of education" was examined by Tsitsia and Kabbah (2020). These and other studies on issues pertaining to Online teaching-learning were recorded as literature.

In adding to the existing literature on the Online teaching-learning in Ghana, this current study sought to examine Colleges of Education students' (teacher-trainees', pre-service teachers') perceptions regarding the Online teaching-learning mode of the Agricultural Science Course. We belief in recognizing opportunities, obstacles and recommending programmatic strategies to increase the efficacy of Online teaching-learning of the Agricultural Science course, our findings

may be useful for academic administrators, educators and other stakeholders in the Colleges of Education system.

1.1 Purpose

The purpose of this study is to examine teacher-trainees' perceptions regarding the Online teaching-learning mode of the Agricultural Science Course.

1.2 Objectives

1. Examine the impacts of the Online teaching-learning mode on students
2. Examine students' encountered challenges associated with the Online teaching-learning of the Agricultural Science course.
3. Examine the teacher-trainees' proposals for an effective Online teaching-learning.
4. Examine students' preferred teaching-learning mode of the Agricultural Science course.

1.3 Research Questions

1. What impact(s) does the online-teaching of the Agricultural Science course have on the teacher-trainees?
2. What challenges do teacher-trainees face in the Online teaching-learning of the Agricultural Science course?
3. What proposals do the teacher-trainees have for an effective Online teaching-learning of the course?
4. What mode(s) of teaching-learning of the Agricultural Science course do teacher-trainees prefer most?

2.0 METHODS

This study seeks to examine teacher-trainees' perceptions regarding the Online teaching-learning mode of the Agricultural Science Course. Descriptive survey design was employed. The use of descriptive survey is useful in producing statistical information about the aspects of education that interest policy makers and educators (Njura, Kubai, Taaliu & Khakame, 2020). This study adopted the descriptive study design to examine the background of the students' perceptions regarding the E-learning.

2.1 Population and Sample

The population for this study consists of second year (level 200) students (teacher-trainees) in the Colleges of Education in Ghana. The sample of the study involved the level 200 teacher-trainees offering Agricultural Science as an elective course. Purposive sampling was adopted to select the study sample. The sample size was made up of 45 teacher-trainees offering the Agricultural Science as an elective course.

2.2 Instrumentation

A survey questionnaire, based on the relevant literature and on the environmental context of the study, was self-designed. The instrument contained four major sections based on the study's

objectives. These include: the impacts of Online teaching-learning, the challenges faced in the Online teaching-learning, the teacher-trainees' proposals for an effective Online teaching-learning and students' preferred mode of course delivery. The respondents' background information measured variables including: gender, and the programme of study. The impact of Online teaching-learning and the challenges on the Online teaching-learning contained Likert scales of: 1=Strongly Agree (SA), 2 = Agree (A), 3 = Undecided (U), 4 = Disagree (D), 5 = Strongly Disagree (SD). Whereas the teacher-trainees' proposals for an effective Online teaching-learning and the students' preferences on the mode of course delivery contained five variables of multiple selections and Yes/No responses respectively. There was a pilot test on the instruments. The survey instrument was administered online using Microsoft survey form. A total of 45 students (respondents) responded to the survey. The respondents' consent was sought. The respondents' confidentiality and anonymity was ensured.

2.3 Data Analysis

Statistical descriptive data analysis was utilised using Microsoft Excel programme and Jamovi Statistical Data Analysis (JSDA) tool. There was internal consistency reliability test of items on the two constructs with the Likert scales using the Cronbach's Alpha (α) reliability analysis measures. According to Miller (2006), a reliable test produces coherent outcomes when it is being tested recurrently. Fraenkel and Wallen (1996) indicated that reliability item is acceptable if the alpha is within 0.70 - 0.99. On the other hand, Kubiszyn and Borich (2000) are of the view that alpha value within 0.80 - 0.90 is considered acceptable. However, Ghazali (2008) indicated that the alpha value of 0.60 is also considered acceptable. This study attained the alpha values of 0.82 and 0.78 on the two constructs with the Likert Scales.

3.0 RESULTS

The major purpose of this study was to examine teacher-trainees' perceptions regarding the Online teaching-learning mode of the Agricultural Science Course in the Colleges of Education, Ghana. The results of the quantitative descriptive analysis are presented in tables and charts. The results were presented based on the sections of constructs for the survey. These include: the respondents' background information, impact of Online teaching-learning, the challenges on the Online teaching-learning, the teacher-trainees' proposals for an effective Online teaching-learning and the students' preferred mode of the course delivery. The results are presented in frequencies and descriptive tables and charts.

3.1 Background Information

The survey required the respondents' gender (sex types) and programmes of study as the background information.

Figure 1: Gender

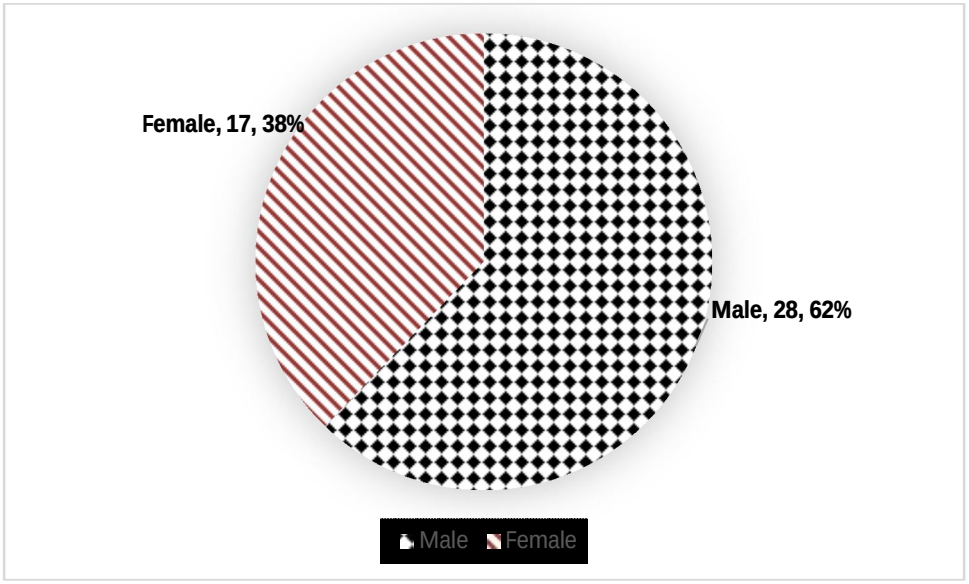
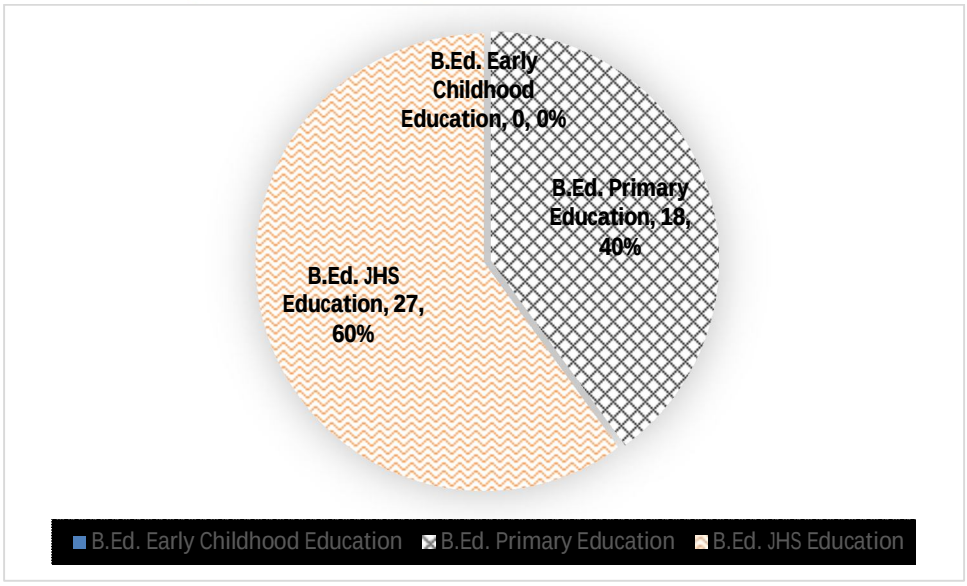


Figure 2: Programmes of Study



The figures 1 and 2 present statistics on the students' gender and programmes of study. From the figure 1, out of the total of 45 respondents, 28(62%) were males and the remaining 17(38%) were females. The Bachelor of Education (B.Ed) programmes of JHS and Primary Educations were offered by 27(60%) and 18(40%) respondents respectively, while none of them offered B.Ed Early Childhood Education.

3.2 Impacts of the Online Teaching-Learning of the Agricultural Science Course

Table 1: Frequencies: – Impacts of the Online Teaching-Learning of the Agricultural Science Course

Items	SA		A		U		D		SD	
	N	%	N	%	N	%	N	%	N	%
I can effectively work independently.	13	**28.9**	23	**51.1**	5	**11.1**	4	**8.9**	0	**0**
I am self-motivated in learning the course.	15	**33.3**	19	**42.2**	5	**11.1**	4	**8.9**	2	**4.4**
I have developed the requisite knowledge of the course contents.	4	**8.9**	22	**48.9**	4	**8.9**	15	**33.3**	0	**0**
I can access information and communicate effectively.	10	**22.2**	26	**57.8**	4	**8.9**	5	**11.1**	0	**0**
I can research and present information effectively on the course.	14	**31.1**	19	**42.2**	7	**15.6**	5	**11.1**	0	**0**
I am confident using the online learning mode for the course.	1	**2.2**	21	**46.7**	4	**8.9**	19	**42.2**	0	**0**
I have had enough learning resources to aid me excel in the course.	4	**8.9**	13	**28.9**	6	**13.3**	22	**48.9**	0	**0**

Table 2: Descriptive: – Mean Responses of the Impacts of the Online Teaching-Learning of the Agricultural Science Course

Items	N	Mean	Median
I can effectively work independently.	45	2.0	2.0
I am self-motivated in learning the course.	45	2.1	2.0
I have developed the requisite knowledge of the course contents.	45	2.7	2.0
I can access information and communicate effectively.	45	2.1	2.0
I can research and present information effectively on the course.	45	2.1	2.0
I am confident using the online learning mode for the course.	45	2.9	3.0
I have had enough learning resources to aid me excel in the course.	45	3.0	3.0

The tables 1 and 2 present both the frequencies and the descriptive mean and median results on the construct: 'impacts of the Online teaching-learning of the Agricultural Science course'. There were seven variables tested in all. The percentage frequencies of respondents showing agreement on the variables include: 80.0, 75.5, 57.8, 80.0, 73.3, 48.9, and 37.8. These are related to the variables: "I can effectively work independently, I am self-motivated in learning the course, I have developed the requisite knowledge of the course contents, I can research and present information effectively on the course, I am confident using the Online teaching-learning mode of the course and I have had enough learning resources to aid me excel in the course" respectively. The construct also recorded low mean values in favour of the corresponding agreements on the variables. Of this, the range of means for the first five variables compared to the median is from 2.0 to 2.7. And the last two variables from the table recorded the high mean values of 2.9 and 3.0 each, with the median as 3.0 each, showing disagreement of the variables.

3.3 Challenges Encountered in the Learning of the Course Online

Table 3: Frequencies: – Challenges Encountered in the Learning of the Course Online

	SA		A		U		D		SD	
ITEMS	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Lack of basic skills in ICT usage (e.g. searching for information on the Net).	27	**60.0**	11	**24.4**	0	**0**	2	**4.4**	5	**11.1**
Lack of assistance from the course tutor.	8	**17.8**	19	**42.2**	2	**4.4**	7	**15.6**	9	**20.0**
High cost of internet data bundles	38	**84.4**	5	**11.1**	0	**0**	1	**2.2**	1	**2.2**
Low, No or Unstable internet connection.	33	**73.3**	9	**20.0**	0	**0**	1	**2.2**	2	**4.4**
Lack of technical support.	25	**55.6**	14	**31.1**	1	**2.2**	2	**4.4**	3	**6.7**
Inability to use the internet effectively.	23	**51.1**	14	**31.1**	1	**2.2**	5	**11.1**	2	**4.4**
No standard E-learning platform in the College.	18	**40.0**	16	**35.6**	1	**2.2**	7	**15.6**	3	**6.7**
Insufficient or no learning resources shared on the course contents.	18	**40.0**	14	**31.1**	3	**6.7**	6	**13.3**	4	**8.9**

Course tutors' insufficient knowledge in the use of modern technologies for online instructional delivery.	8	**17.8**	18	**40.0**	1	**2.2**	11	**24.4**	7	**15.6**
Unable to cover the required course contents.	15	**33.3**	19	**42.2**	2	**4.4**	5	**11.1**	4	**8.9**
Persistent home pressures.	29	**64.4**	12	**26.7**	1	**2.2**	1	**2.2**	2	**4.4**
The practical aspects of the course was left unattended to.	28	**62.2**	13	**28.9**	1	**2.2**	2	**4.4**	1	**2.2**

Table 4: Descriptive: – Mean Responses of the Challenges Encountered in the Learning of the Course Online

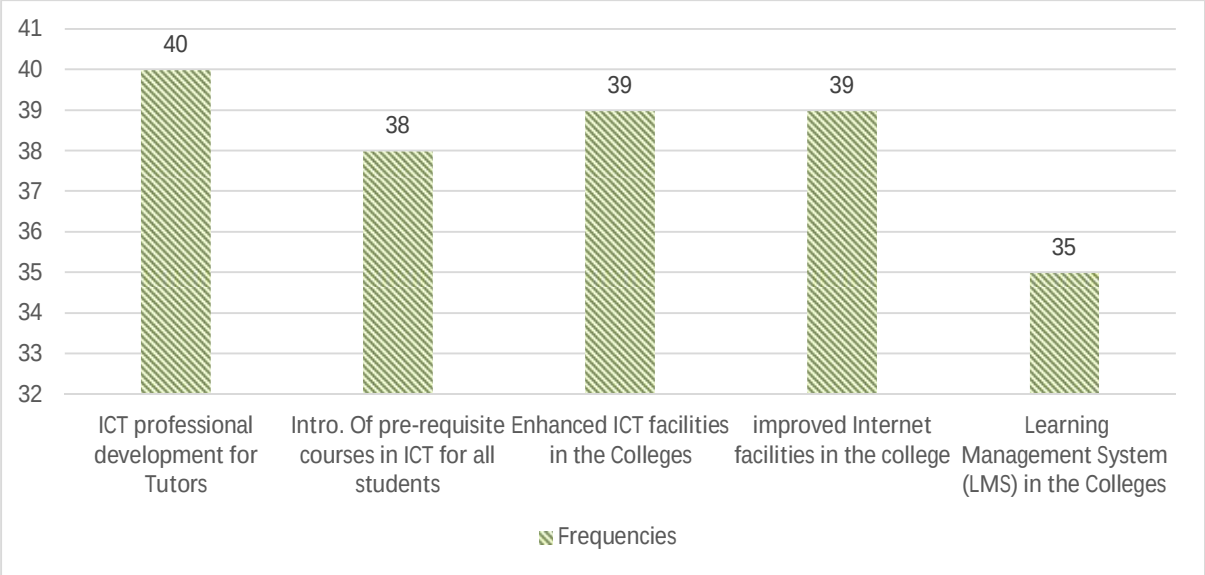
Variables	N	Mean	Median
Lack of basic skills in ICT usage (e.g. searching for information on the Net).	45	1.8	1.0
Lack of assistance from the course tutor.	45	2.8	2.0
High cost of internet data bundles	45	1.3	1.0
Low, no or unstable internet connection.	45	1.4	1.0
Lack of technical support.	45	1.8	1.0
Inability to use the internet effectively.	45	1.9	1.0
No standard E-learning platform in the College.	45	2.1	2.0
Insufficient or no learning resources shared on the course contents.	45	2.2	2.0
Course tutors' insufficient knowledge in the use of modern technologies for online instructional delivery.	45	2.8	2.0
Unable to cover the required course contents.	45	2.2	2.0
Persistent home pressures.	45	1.6	1.0
The practical aspects of the course was left unattended to.	45	1.6	1.0

The records on the construct; "Challenges Encountered in the Learning of the Course Online" was examined based on twelve variables. Both the tables 3 and 4 showed clearly the frequencies of the respondents being high and the means of the responses being low in admittance of challenges

encountered in the learning of the course online. The representations of the total percentage frequencies on the variables agreed on include: "lack of basic skills in ICT usage (84.4%), lack of assistance from the course tutors (60%), high cost of internet data bundles (95.5%), low, no or unstable internet connections (93.3%) and lack of technical support (86.7%). The rest include: Inability to use the internet effectively (82.2%), no standard E-learning platform in the Colleges (75.6%), insufficient or no learning resources shared on the course contents (71.1%), course tutors' insufficient knowledge in the use of modern technologies for Online instructional delivery (57.8%), unable to cover the required course contents (75.5%), persistent home pressures (91.1%) and the practical aspects of the course was left unattended to (91.1%).

3.4 Teacher-trainees' Proposals for an Effective Online Teaching-learning

Figure 3: Teacher-trainees' Proposals for an Effective Online Teaching-learning



In the construct of students' proposals for an effective online teaching-learning, five variables were presented for which respondents were allowed to select as many as is worthy. The results, as presented on figure 3, show all the variables are of high frequency rate of students' proposals. This ranges from the frequency rates of 35 to 40. Of these, students' proposals fall much on the 'professional development for tutors' with a frequency rate of 40 and the 'availability of learning management system' having the least but also with a high frequency rate of 35 out of the 45 respondents.

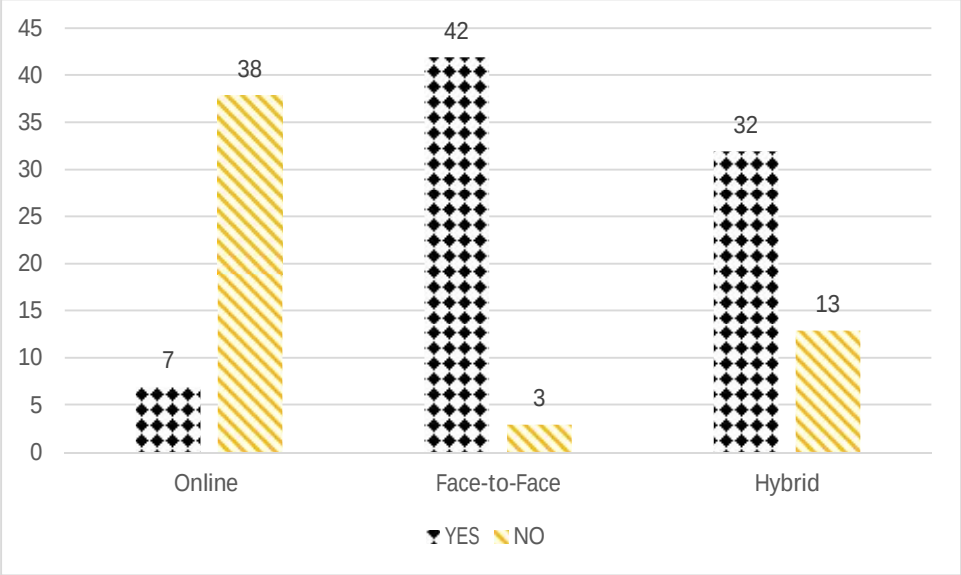
3.5 Students' Preferred Mode of the Agricultural Science Course Delivery

Table 5: Descriptives: – Students' Preferred Mode of the Agricultural Science Course Delivery

	N	Mean	Median
I prefer the online teaching-learning mode.	45	1.84	2.0
I prefer the face-to-face teaching-learning mode.	45	1.07	1.0
I prefer the hybrid (combination of online and face-to-face) teaching-learning mode.	45	1.29	1.0

The variables on the construct on Students' Preferred mode of the Course Delivery was slated for 'Yes' or 'No' responses and this was later coded as '1 and 2' respectively for statistical analysis. The table 5 gave descriptive result on mean and median of the responses. Both variables on the face-to-face and hybrid teaching-learning modes received low means of 1.07 and 1.29 respectively with the value of 1.0 as the median each. This portrays students' high preference of the face-to-face and the hybrid teaching-learning modes. The preference on the Online teaching-learning mode has a high mean and median values of 1.84 and 2.0 respectively indicating students' low preferences of it. The figure 4 illustrates the frequencies on the students' preferred mode of teaching-learning of the Agricultural Science course.

Figure 4: Students' Preferred Mode of the Agricultural Science Course Delivery



4.0 DISCUSSIONS

In this study, the researchers examined the teacher-trainees' perceptions regarding the Online teaching-learning mode of the Agricultural Science Course. The variables examined were categorized into four sections covering the four research questions based on the specific objectives of the study.

The research question one sought to examine the impacts of the Online teaching-learning of the Agricultural Science course. Seven constructed variables were examined based on the impacts of the Online teaching-learning of the course. The findings of Alston, and English (2007) revealed that respondents basically agreed that there were many benefits to Web-enhanced (Online) courses and they perceived all Web site components under study to be very useful. In-line with the previous findings, the results of this current study, as shown in the tables 1 and 2, discovered that the teacher-trainees' massively agreed that the Online teaching-learning helped them to: effectively work independently, be self-motivated in learning the course, develop the requisite knowledge of the course, access information and communicate effectively, and research and present information effectively on the course. These variables had the respondents' frequency rates of 80.0%, 75.5%, 57.8%, 80.0% and 73.3% respectively. However, only 48.9% and 37.8% agreed being confident in using Online learning contents and have had enough learning resources to aid them in learning the course.

The research question two sought to examine the challenges encountered in the Online teaching-learning of the Agricultural Science course. Twelve variables were considered based on the challenges faced in the Online teaching-learning of the course. From tables 3 and 4, it is evident clearly that the frequencies of the respondents being high and the means of the responses being low in admittance of challenges encountered in the learning of the course Online. Averagely, about 80.4% of the respondents admitted the existence of challenges in learning the course online for the twelve variables. Lack of basic skills in ICT usage (84.4%), high cost of internet data bundles (95.5%), low, no or unstable internet connection (93.3%), lack of technical support (86.7%), no standard E-learning platform in the Colleges (75.6%) and persistent home pressures (91.1%) are few examples of per variable frequencies. These findings are in-line with the findings of Tsitsia, et al (2020) that students faced challenges with the Online teaching-learning such as: high cost of internet data, unstable internet access, home pressures and unavailability of learning management system in the Colleges among others.

The research question three sought to examine the teacher-trainees' proposals for an effective Online teaching-learning. In all, five variables: professional development for Tutors on the use of ICT tools, pre-requisite courses in ICT for all students, improvement of ICT facilities in the Colleges, improvement of Internet facilities in the College and embracing the Common Learning Management System (LMS) in the Colleges were involved. Averagely about 84.9% (38) of the respondents suggested the need for each of the five variables. The frequencies of the respondents are displayed in figure 3.

The research question four examined teacher-trainees' preferred teaching-learning mode of the Agricultural Science course. The three modes of learning considered include: the Online, Face-to-

face and the Hybrid. The findings of the studies (Tsitsia & Kabbah, 2020 and Krishnan, 2016) revealed that students' preferred mode of Mathematics learning are face-to-face and the hybrid. The findings of this current study confirmed the very two modes as the most preferred as evident in table 5 and figure 4.

5.0 Conclusion and Recommendations

5.1 Conclusion

This study sought to examine teacher-trainees' perceptions regarding the Online teaching-learning mode of the Agricultural Science Course in the Colleges of Education, Ghana. Specifically, the study considered the following major sections: the impacts of the Online teaching-learning mode, challenges associated with the Online teaching-learning of the course, the teacher-trainees' proposals for an effective Online teaching-learning, and the teacher-trainees' preferred teaching-learning mode(s). The findings revealed that the Online teaching-learning significantly impacted positively on students' learning with an average rate of 64.8% frequency. A greater number of respondents of about 80.4% averagely admitted to have had challenges with the Online teaching-learning. The findings also revealed that the students' preferred learning modes of the Agricultural Science course are the face-to-face and the hybrid.

5.2 Recommendations

Based on the findings of the study, the following recommendations are made:

1. The Colleges are recommended to organize professional development for Tutors on the use of ICT tools for Online instructional deliveries.
2. The Colleges of Education curriculum developers are entreated to make pre-requisite courses in ICT available for all students.
3. The College Managements and the relevant stakeholders are encouraged to improve the Internet facilities in the Colleges.
4. Embracing the Common Learning Management System (LMS) in the Colleges by the College Managements and the relevant stakeholders is highly recommended.

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