



INSIGHT INTO KNOWLEDGE AND PRACTICE OF ONLINE LEARNING METHODS IN A HIGHER EDUCATION INSTITUTION IN PORT HARCOURT, NIGERIA

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Abstract: Background: The Covid-19 pandemic in 2020 as declared by the World Health Organization (WHO) with all its grave global impact changed the world, notably as it relates to the delivery of learning in the educational sector. To incorporate online learning into the educational system and overcome barriers to adoption, foster a culture of maintaining a positive attitude to the use of e-learning tools and technologies during the pandemic required good planning. This study set out to determine the level of awareness and preparedness of clinical tutors in the use of online teaching methods before Covid-19 in the University of Port Harcourt medical school, Nigeria. **Methodology:** A population survey of the clinical tutors of University of Port Harcourt on adoption of online teaching and learning method probed into the awareness component of the process in the university during the early phase of Covid-19 pandemic. A questionnaire-based un-coded Google form was the data collection tool applied to respondents to ensure anonymity. SPSS version 24 and EXCEL packages were used to statistically analyze acquired data. **Result:** Basic statistical analyses of a population survey of clinical tutors in the faculty of clinical sciences showed that a quarter were totally unaware of innovative digital and online methodologies of learning. Majority were familiar with some modalities, notably simulation in about 50%; virtual teaching (45%); blended learning (30%) and flipped classroom consisting of 21% of respondents. While 45% and 48% claimed to be fairly and highly skilled in using digital gadgets respectively, 70% claim to have between 70 – 90% competence levels in the use of such devices. However, virtually all clinical teachers have used one form or another messaging platform. Sadly, less than 10% have comparatively adequate training in one or more methodologies on delivery of online distance learning before and during covid-19 pandemic. **Conclusion:** In the Faculty of clinical sciences, University of Port Harcourt, there was relatively poor awareness of the emerging LMS applicable in online learning by clinical tutors despite their appreciable use of other messaging platforms using a variety of personal electronic gadgets. This new method of learning still remained rudimentary and in preparatory stage, especially in professions needing practical and specialized psychomotor skills, even during and soon after the Covid-19 pandemic.

Keywords: Awareness, Digital, Virtual, Online Learning.

Background

Awareness, defined as “knowledge or perception of a situation or fact; concern about and well-informed interest in a particular situation or development” (Oxford Dictionary) is the first step in the series of cognitive processes of learning. Availability of requisite knowledge,

infrastructures and the right attitude to embrace and explore new ideas, processes and activities has been the bane of our developmental and technological cretinism. A robust statutory and administrative policies are necessary to ensure full realization and beneficial outcome for societal good. Therefore, awareness of novel innovative

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learning methodologies by students and faculty is prerequisite to e-learning.

The emergence and rapid spread of the novel coronavirus (SARS CoV-2) or Covid-19 in December, 2019 in Wuhan, China; the declaration by WHO on 11th March, 2020, of the disease as pandemic; and, introduction of preventative control measures to reign in the spread of the virus [WHO 2020) caused great disruption of human activity of such unimaginable proportion worldwide. The impact on the world economy, healthcare, education, Social environment and demography were disabling. The worldwide impact on Medical Education has been extremely profound in terms of teaching and learning (Ferrel & Ryan, 2020).

Nigeria, like most other countries, United States of America (AMCC); UK (Binksa, 2021); Croatia (Pujak et al., 2020), quickly closed all educational facilities for the year (Oladipo et al., 2020); and responded differently within their domains, institutions and corporations by adopting peculiar strategies to overcome these induced challenges (Fatima et al., 2021; Baqir & Mustansir, 2021; Espino-Díaz, 2020; Robyn-Jenia, 2020; Papapanou et al., 2021; Vijayan, 2021).

These decisions, which were mainly political, ostensibly without consultations with either school authorities or university administrators, was prevalent in many countries including Nigeria. The burden was, therefore, left to individual medical school administrators and instructors to fashion out ingenious ways to direct teaching and learning for medical students.

Traditional face-to-face teaching in educational institutions was affected as a result of the preventative measures to Covid-19 infection with somewhat greater consequences on the education of clinical students. Covid-19 pandemic presented the stimulus to the long-expected transition to online learning. The consequent limitation of physical interactions as evidenced by multiple lockdowns motivated and accelerated the use of online learning and new innovative strategies, including new assessment

methods (Jodheea-Jutton, 2021; Wilson & Shankar, 2021) in the learning space.

In response to these urgent needs for sustaining qualitative medical education, Medical Educators had to quickly adapt to the fledging online Distance Education learning involving both synchronous and asynchronous methodologies – dubbed as virtual, online, digital distance learning systems (Rainbow & Dorji, 2020; Brady & Pradhan, 2020; Baqir & Mustansir, 2021; Qamar et al., 2021).

In the clinical years of medical education, clerkship of patients, physical examination, participation in procedures and therapy requires that students interact with patients, faculty, other health workers and patients' relations make sole application of distant learning technologies inadequate to attain the desired objective of training highly skilled doctors (Robyn-Jenia, 2020; Barman, 2005).

The transition to the online educational format is dependent on access to high-speed internet of which disparity in its availability in a country puts the process in jeopardy. Another key element to students' success and satisfaction in online education is teacher and student awareness, preparedness and attainment of expectations. Lack of preparation by students for the rapid transition is bound to result in failure to reach stated curricular objectives. Coupled with this challenge, our expectation was that the technologically savvy students of this generation would have the necessary drive to be as engaged online as during normal on-campus sessions. While the methods, educational goals, and delivery are often the same, the environment are different.

Application of learning pedagogies in the 21st century finds expression in novel innovative methods of learning (Murugesan, 2019; Revathi & Saravanan, 2019; Låg, & Sæle, (2019) principally driven by technology – the Web, multimedia, ICT, Cloud computing and the unrelenting effort by educators to expand the horizon. Among these new methods are Crossover Teaching; Smart Boards; Flipped Classrooms; Collaboration; Virtual Reality;



Online learning; 3D printing technology and Cloud Computing (Nouri, 2016; Pensieri & Pennacchini, 2014; Pottle, 2019; van Gaalen, 2021; Nieto-Escamez & Roldán-Tapia, 2021; Adel & Dayan, (2021). They are often applied and employed to improve on e-learning strategy and assisted in impacting requisite knowledge and proficiency aptitude on learners.

The practical limitation of online learning is that medical students are not provided with sufficient real life clinical situations to actually experience medical practice in the course of their clerkships. Therefore, opportunities for high-fidelity simulation education provided through these innovative technologies provide experience similar to actual conditions are expounded in order to produce doctors with excellent medical competency (Yu JH et al., (2021). The main purpose for selecting any or a combination of online methods of teaching clinical students by tutors should be towards acquisition of knowledge, attitude and skill (KAS) – (Krathwohl, 2002; Miller, 1980).

Aim

To determine the level of awareness/knowledge, preparedness of clinical tutors and use of online teaching methods before Covid-19, referencing the University of Port Harcourt medical school, Nigeria.

Objectives

1. To evaluate the awareness level or knowledge of online learning methodologies by clinical teachers in the medical school under study before Covid-19 pandemic.
2. Determine the type and of use of digital devices by clinical teachers in the medical school before Covid-19 pandemic.
3. Determine, by self-assessment, the skillful use of digital gadgets by clinical tutors in the medical school before Covid-19.
4. Find out, by self-assessment, the level of skill in messaging using digital devices by clinical teachers in the medical school before Covid-19 pandemic.

5. Assess the preparedness by training on online teaching methods of the clinical tutors in the study population before onset of Covid-19.

6. Determine, by self-assessment, the level of mastery in the use of online teaching methods by clinical tutors before Covid-19.

Methodology

This was a census study of current clinical lecturers or instructors obtained from the data base of the Faculty of Clinical Sciences, College of Medicine, University of Port Harcourt, Nigeria to whom an online questionnaire using the Google form which was web-administered by email to respondents two years after the onset of Covid-19 in Nigeria.

A structured, self-applied questionnaires applied to the population under study, which was prepared specifically as a tool for the study. Data collected included knowledge of, preparedness (by training on online teaching methods) and use of Online Teaching Methods (OTM) by clinical tutors in University of Port Harcourt before and during the Covid-19 era. Aside from the bio-data of respondents, most of the questions relating to knowledge, availability and use of online teaching methodologies were presented in the Likert Scale format (e.g. Strongly agree, Agree, Somewhat Agree, Slightly Disagree, Disagree) and few open-ended questions, where necessary. Data collected were collated, and analyzed using Excel and SPSS packages.

Validity/Reliability of Instrument

This instrument of data collection underwent content validity by administering the questionnaire to ten (10) tutors who were a subset of the population being studied. Each of the ten tutors in the pilot study assessed each item and their inputs were used in adjustments of the question threads. Reliability testing was also carried out and Internal Reliability using the Cronbach alpha was 0.75.



Inclusion/Exclusion Criteria

This was a population study recruiting all clinical tutors in the Faculty of Clinical sciences, College of Medicine, University of Port Harcourt except tutors who are retired, dead or on contract, leave of Absence, currently on overseas training and on sabbatical leave during the period of the study.

Ethical Issues

Ethical Approval was obtained from the ethical committee of the University of Port Harcourt, Nigeria. Consent was obtained from respondents in the opening statement of the Google form on individual freedom to participate or opt out from the study while anonymity was ensured by not encoding the forms.

Result

The analysis of data was based on responses from 104 clinical tutors of a total of 136 to whom the study questionnaires were sent to. One hundred and one (101) responses were accepted for analysis as three (3) were voided for incorrect entries; culminating in a recovery rate of seventy – four percent (74.3%).

Awareness of Innovative Digital Learning Methodologies Known to Clinical Tutors

This study shows that about a quarter (24%) of clinical tutors were totally unaware of while a sizeable majority were familiar with other innovative teaching methodologies such as flipped classroom; blended learning; simulation and online virtual teaching. Simulation seem to be the most widely known and used innovative methodology by clinical teachers who indicated affirmation in forty-nine (49%), followed by online (virtual) teaching in Forty-five percent (45%); and, blended learning (30%) with flipped classroom constituting 21% of responses. Virtual reality at 14% is upcoming, away from such innovative means like crossover teaching, cloud computing, 3D – printing and gamification shoring 5% or less, which appear alien to the study group under consideration. These facts call for more efforts in the training diversification and deployment of modern and futuristic tools of teaching.

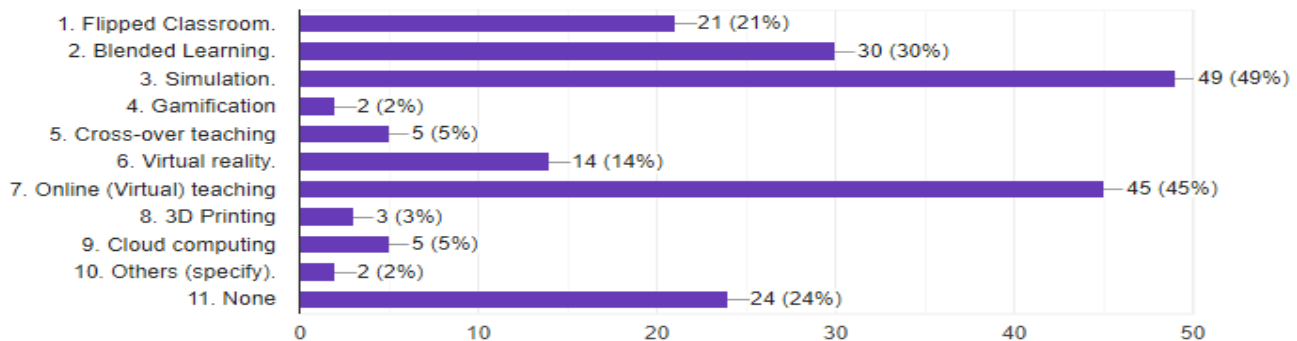


Figure 1. Innovative Digital Teaching methods known to clinical tutors

Preparedness By Clinical Tutors Towards Online Teaching

The ownership of computer devices, skill or competency level, actual use, familiar messaging platforms, trainings on the use of and the utilization of online teaching methods before, during and after the first wave of covid-19 in Nigeria are presented as a conglomerate of one key factor, referred to in this study - 'Preparedness'. These characteristics of clinical teachers are presented below for clarity.

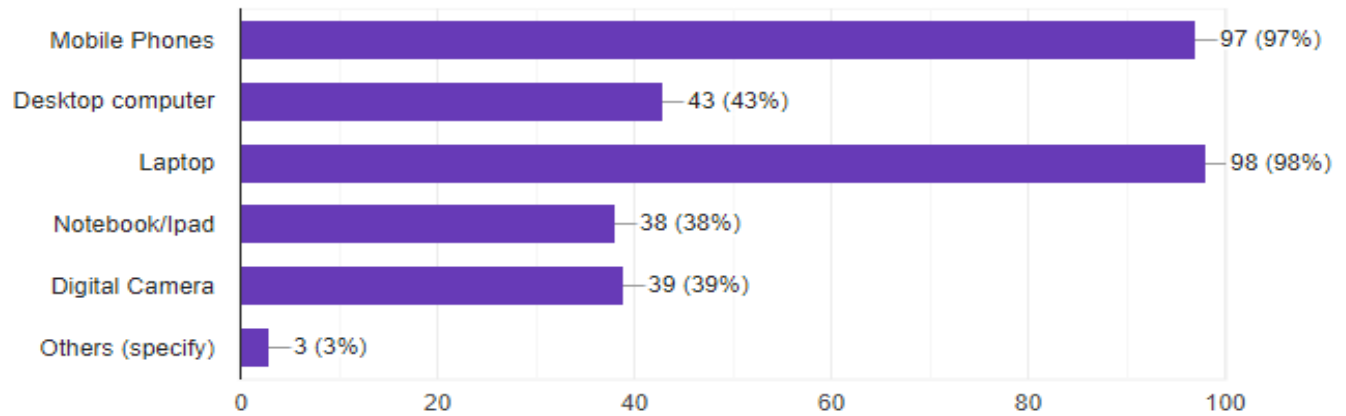


Figure 2. Ownership and use of digital devices by clinical teachers.

Almost all clinical lecturers, 100% and 99% own and use mobile phones and Laptop respectively; and, consider themselves fairly [34 (34%)] to highly skilled [48 (48%)] in their use. The result so obtained somehow tallies with the self-assessment rating. Hence, it could be said that the clinical teachers are digitally compliant or literate and capable of delivering online teaching, if properly trained

Skillful use of digital gadgets by clinical tutors

Considering a self - assessment rating of 5 as average skill in the use of digital gadgets on the scale of 1-10; only 3 respondents self-scored below average skill. An average skill of 5 makes up 9% of the study group and 88% are stated to be above average. Fifty-one percent (51%) profess excellent skill above 80%. In this study, the mean of skill status of the group is $7.5 \pm 1.4SD$. Thus, this could be indicative of high proficiency level of clinical tutors in the use of digital devices.

Table: 1. Skillful Use of Digital Gadgets (Skill Rating from 1 – 10)

Table: 1. Skill rating from 1-10

4	3	3.0
5	9	9.0
6	11	11.0
7	26	26.0
8	30	30.0
9	14	14.0
10	7	7.0
<i>Mean±SD</i>	<i>7.5±1.4</i>	

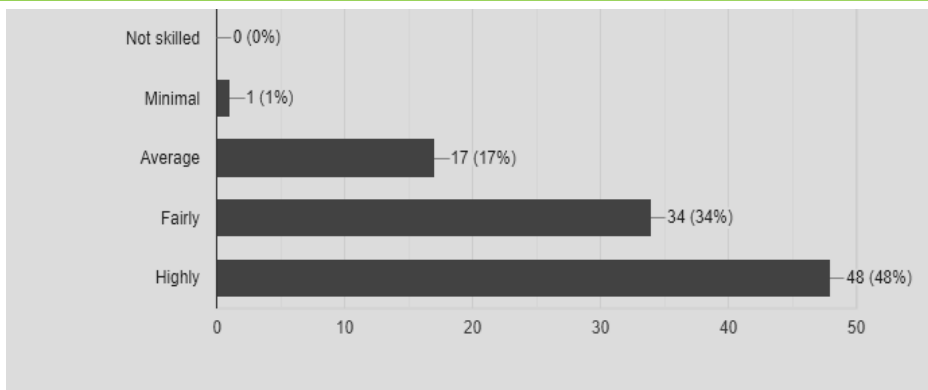


Figure 3. Level of skill in Messaging using Digital devices.

Level of skill in Messaging using Digital devices

Most clinical lecturers frequently use, visit and are conversant with Yahoo/Google messengers, WhatsApp, Facebook and YouTube platforms. Of all messaging platforms indicated, WhatsApp is the most commonly used ninety-nine percent (99%); followed by Yahoo/Google messengers makes up Seventy-seven percent (77%). Others include Facebook (75%); YouTube (58%); Instagram (25%); Twitter (23%), To Go (3%) and others unspecified making up 6%. Practically all clinical tutors do have knowledge of or used, at least, one messaging platform previously.

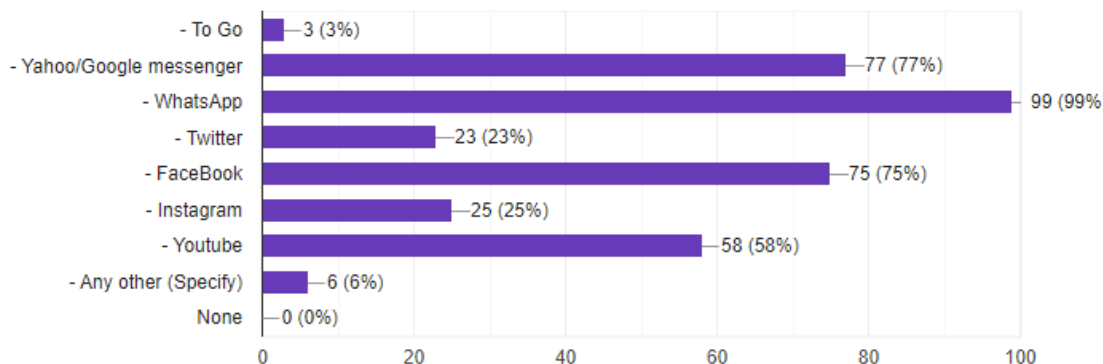


Figure 4. Basic Familiar Messaging Platforms in use by clinical tutors

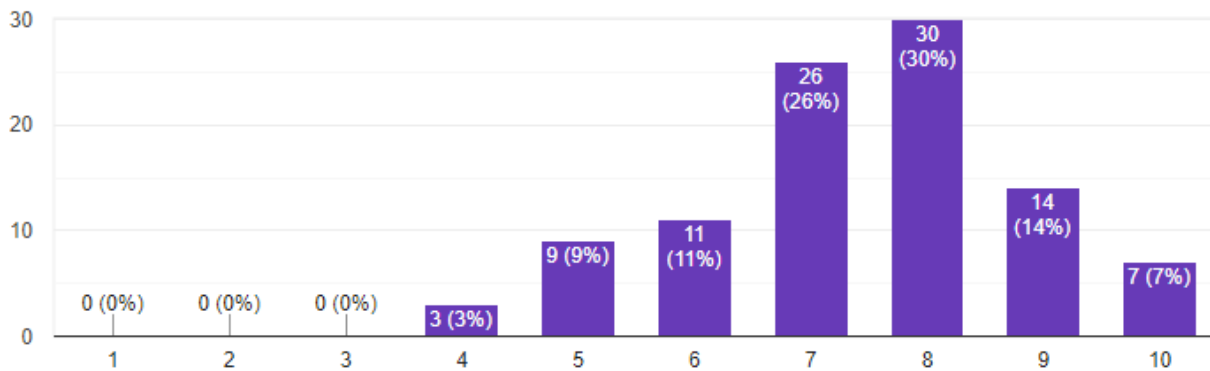


Figure 5: Self-Assessment rating on skill using Digital devices.

In general terms, 70 (70%) from self-assessment, claim to have between 70-90% competence level. Only three respondents are found in the poorest rating of 4 in a scale of 1 – 10. Nine persons scored an average of 5; and less than 10% claim a near – perfect dexterity in the use of these messaging platforms.

Tutors trained on Distance Digital Learning early in the Covid-19 period.

In respect of actual training, regarded as the core of preparedness, approximately a third (33%) of clinical teachers had no training or any preparation in the use online distance learning methodologies. About 40% had very few training sessions (1-2) times and a fifth, about 3-4 times of training. Less than ten percent (10%) had frequent trainings. Thus, cursorily, there appears an obvious lack of preparation in the delivery of online instructional materials to clinical students in the University of Port Harcourt.

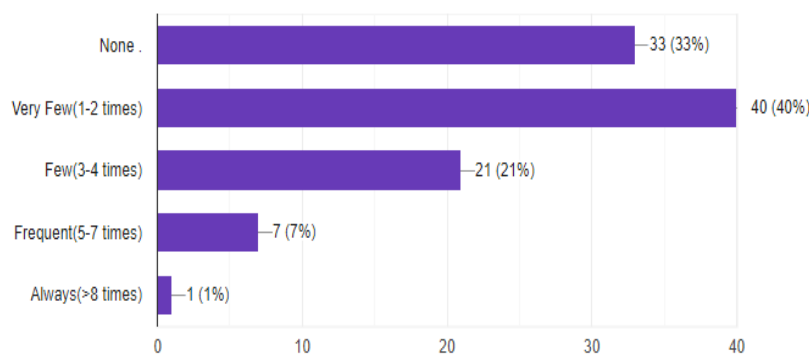


Figure 6. Tutors trained on Distance Digital Learning during Covid-19 First wave

Among those who underwent the process, Google classroom and Zoom platforms were the main media on which training were carried out in 85.3% of instances. About sixty – two percent were trained on the use of the Google classroom, after the University paid for a subscription bundle; and, twelve percent on WhatsApp.

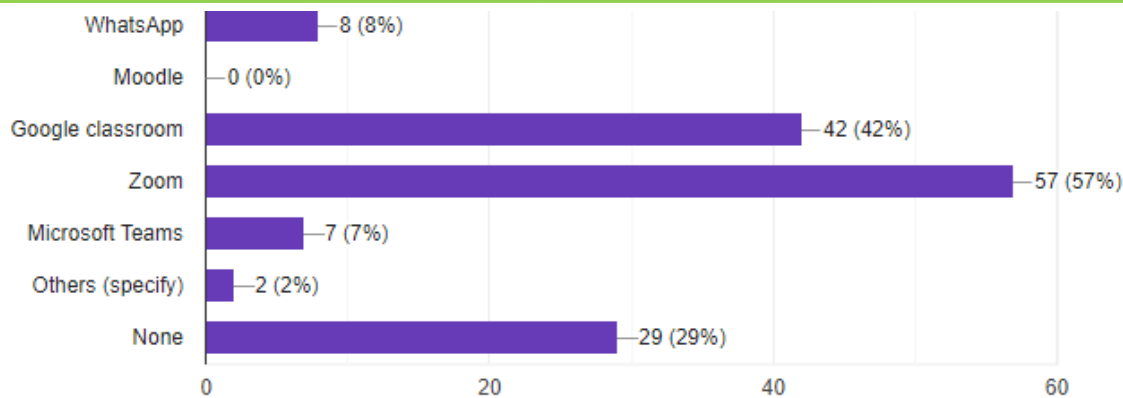


Figure 7. Online Teaching Platform used in Tutor Training.

Mastery of the common online teaching methods

Considering the competence level in the mastery of each of the online teaching platforms, the results may reflect the reason for use or non-use of any particular digital means of communication. A self-assessment competency scale of 1 – 10 (mastery) for each method of digital communication platforms of teaching is presented to show any trend.

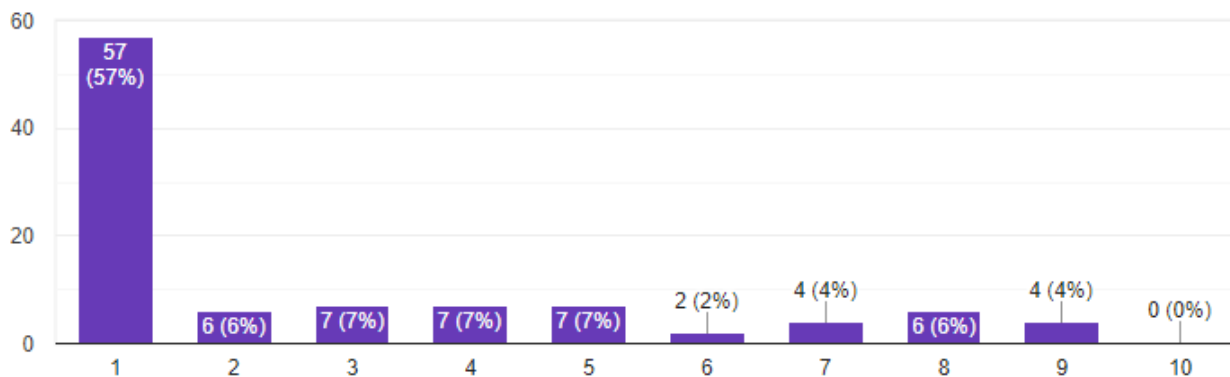


Figure 8. Self-assessment of Moodle mastery.

A whopping 77% of clinical tutors have none or below average mastery of the Moodle online platform. Only 7% claim to have an average mastery of this type of delivery method.

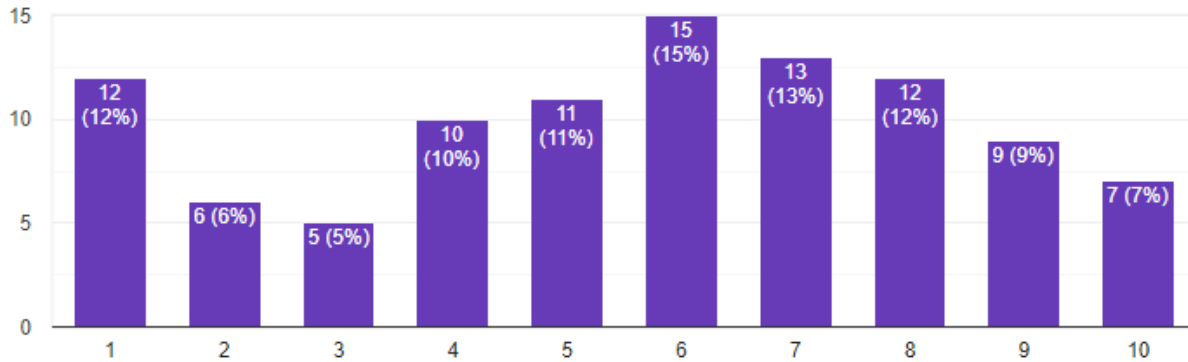


Figure 9. Self-assessment of mastery of Google classroom.

The self-assessment rating on mastery of Google classroom that 56% are above average and only 28% scoring have excellent skill of 8 upwards.

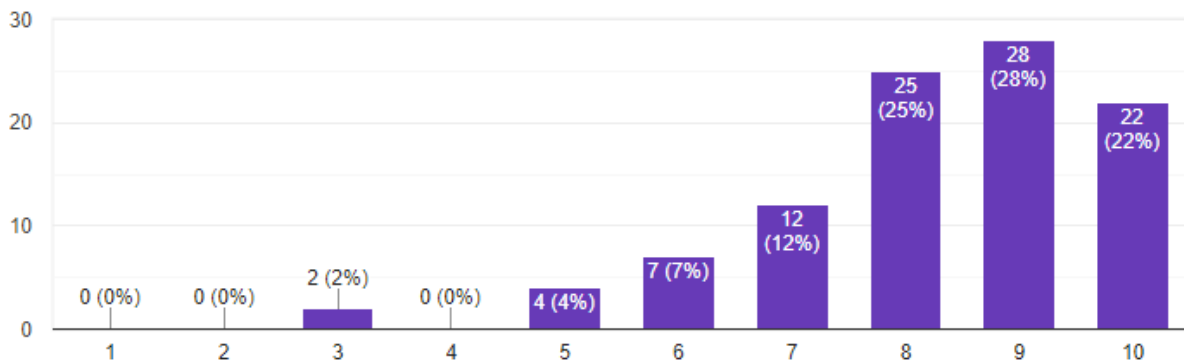


Figure 10. Self-assessment of Zoom mastery.

The Zoom teleconferencing platform came into prominence during the first wave of covid19 pandemic and its use has remained sustained till date. Most (94% of) clinical teachers claim to have above average mastery of Zoom. Only 2 persons accepted being below average and 4 percent claim just being of average competence in using the Zoom platform.

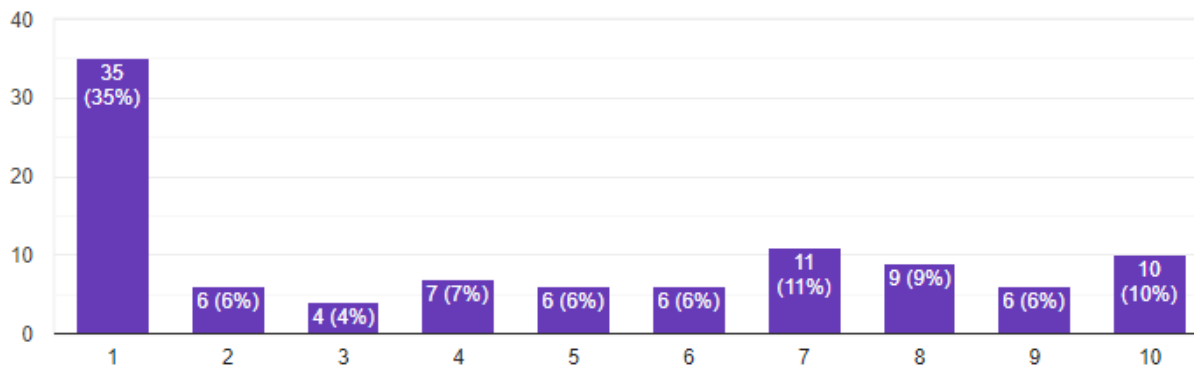


Fig. Self-assessment of mastery of use of Microsoft Teams.

Again, the mastery in the use of Microsoft platform was poor, as close to 50% of those who proclaim to be conversant with it in any way score below average. Five responses are average while 42 are above average in its use.

Taken together, about 89 (89%) of clinical tutors in this study appear to have above average mastery of the use and application of online teaching platforms in executing instructional programs, more so for Zoom than Google classroom, following training offered and implemented by the university administration.

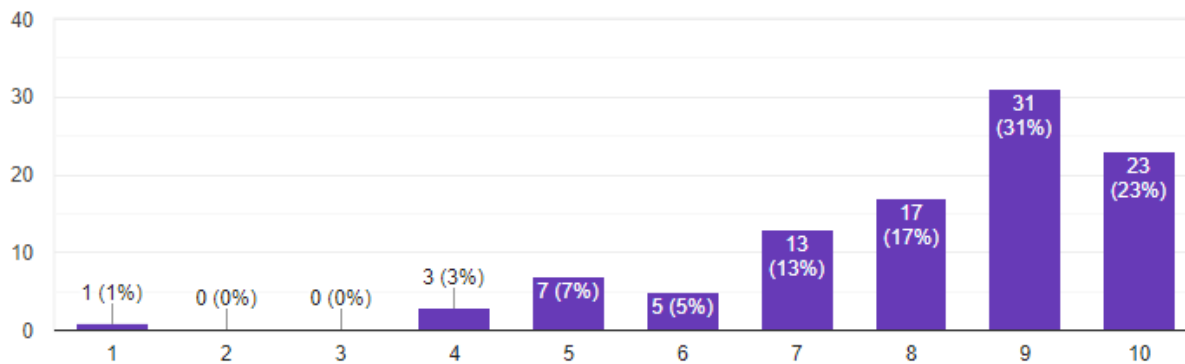


Figure 11. Self-Assessment competence level after training in online teaching.

Preparation, therefore, is the key to success in the continuous quest for development of medical personnel in any adverse world disaster events.

Before the covid-19 period, 48 (48%) of clinical teachers had never delivered any online presentation of any sort. About 31 (31%) of the tutors had sparingly done online distance learning presentations and a fifth had frequently been using online teaching methods (considering summation of few and very few groups). A miserable 3% had always been using messaging platforms for

instructional purposes before the covid-19 era. During the first wave of covid-19, there was a marginal reduction among those who have not used any online teaching platform which fell from almost half of respondents to about a third. Consequently, noticeable is a slight increase from 31% to 44% of scanty users. Frequent users remain stagnant with a slight upward increase in the number of consistent users to from 3 - 6%. WhatsApp, 40% and Zoom, in 27% were the predominant media platforms utilized for this purpose.

Discussion



The findings that essentially all clinical tutors owned and used computer devices; and, were already conversant in basic Internet messaging platforms is very encouraging. This provides the foundation for a quick uptake of adoption of online or digital methods of instructional delivery of learning. However, the relatively large number of non-participants in the training programs may have impacted negatively on the final outcome of the desired result. According to the Oxford Advanced Learner's Dictionary definition of Preparedness as "a state of being ready and willing to do something", the rapidity of the spread of covid-19 globally (WHO, 2020) caught many world governments, education administrations and the public unawares coupled with the attendant economic difficulties, fear and confusion generated by the pandemic, to the extent that educational institutions were not ready (Papapanou et al., 2021, Vijayan., 2021).

Firstly, knowledge of the various methodologies of instructional delivery will advance the attainment of the desired goal of adopting new methods, as familiarity breeds motivation; and, motivation leads to acceptance and use. Hence, the fact that the result of the study shows that knowledge of various innovative learning methodologies was below 50% - regarded as "FAILURE" in clinical medicine assessments, truly, should be expected to culminate in one endpoint, FAILURE. Only a small number of clinical teachers were aware of other online teaching methodologies, apart from long distance (Virtual) learning methods in common use. Simulation, flipped classroom and blended learning being the commonest known methodologies. Virtual reality, gamification, cross-over teaching, cloud computing and 3D printing are still alien to our educational institutions. Training and exposure to these novel methodologies is the surest guarantee to their acceptance, adoption, use and goal attainment in their application to clinical education. Data obtained showed that less than a third of the entire faculty in clinical sciences had any reasonable training in online teaching methods

point to the inadequacy of planning and implementation inherent in the system.

Therefore, a well-structured and coordinated training in the use of online teaching is key to success in the knowledge, adoption and use of any skill set such as online methods of teaching (Binksa, 2021; Qamar et al., 2021). Ordinarily, it is expected that training should translate to adoption and/or use of these online teaching methods and platforms. However, the fact that majority of clinical teachers never had any training sessions may be contributory to the result obtained in this study. There is the probability that participants had not attained the apices of Bloom's Taxonomy (Krathwohl, 2002) and Miller's pyramid of learning and competence (Miller, 1984) in the use of these online methods of instructional delivery of learning. Hence, it is possible that the clinical tutors have not acquired the necessary competence to undertake online teaching confidently. The selection for use of any or a combination of online methods of teaching clinical students by tutors should also consider a balance in acquisition of knowledge, attitude and skill (KAS) – (Krathwohl, 2002; Miller, 1980) for the singular reason of purposeful and satisfying post-covid-19 practice (Puljak, 2020; Amir et al., 2020). Any method of online teaching used should be able to ensure adequate cognitive and proficiency goal attainment for clinical students in the medical institutions.

It is proposed that training and acquisition of profound skillset over time, in all ages will improve dexterity, knowledge and skill in using technologically-related gadgets, remove the fear of and suspicion of digital devices; and, improve the application of these devices in everyday living whether in working or teaching (Binksa, 2021).

It is likely that the Zoom teleconferencing platform will retain its position of predominance in the teaching and learning space, given its simplicity, user-friendliness, free version policy, therefore every clinical tutor should be vast in its features and use. This can only be feasible with



continuing training and necessary upgrade. The need to carry out training in other types of platforms and teaching methodologies cannot be over-emphasized (Brady & Pradhan, 2020). It will provide wider choices for stakeholders and good learning experience for clinical students, thus ensuring satisfactory quality and competency level in their practice post-qualification.

Summary and Recommendation

Online method of teaching and learning which had witnessed a boost during the covid-19 pandemic has come to stay in today's educational space. Its adoption in the years to come would rather see explosion of this trend and its applicability in all faculties and professions, would be the rule, rather than exception. In the light of this study, the following recommendations are proposed:

The University should: i). as a matter of urgency, form a core group made up of experts in educational pedagogies, medical educators, clinical teachers, ICT gurus, sociology and philosophy to fashion out a clear and pragmatic roadmap to adopting and using these innovative digital methods of learning.

ii). Undertake a well-structured, coordinated and streamlined institutional framework to drive robust training in online teaching methodologies, including provision, availability and accessibility of necessary technological infrastructure for effective implementation, not just in medicine but across all other faculties.

iii). Galvanize all stakeholders including the government, regulatory agencies, university administration, clinical teachers, students and the community to fashion out comprehensive, acceptable, and beneficial ways to achieve the desired purpose of online instructional delivery to medical students and doctors.

iv). Reappraisal of Government strategies, legislation, policy direction and funding are essential to goal attainment in the current drive towards online teaching in the educational sector, most especially in the medical field.

v). Advocacy and psychological retuning of both teachers and students to achieve a positive mind-shift and

attitudinal change are pertinent to the success of good education of the populace.

Conclusion: The outcome of this study seems to suggest the possibility that other overarching factors may influence knowledge, diligent preparation; acquisition of skillset and adoption/use such as personality traits, institutional framework/structure, legislation, motivation, cultural norms, funding, willingness and attitude that may impact positively on online teaching methodologies. In view of the limitations and the time constraints in carrying out this study, a more comprehensive study design is imperative to encompass all these factors. This is especially aimed at achieving the goals of distance learning as a tool for clinical education in the medical colleges; which may be applicable to other non-medical faculties for that matter. The significance of this study clearly focuses on the singular objective of speedy assimilation of new technologies and procedures with a view to preventing the chaotic situation that attended the Nigerian learning space during the Covid-19 pandemic.

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