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The Teaching of Practical Skills Online in Professional Schools in the English-Speaking Sub-System of Education in Cameroon: Constraints and Possibilities

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ABSTRACT: The paper aimed at assessing the effectiveness of the teaching of practical skills online in professional schools in the English sub-system of education in Cameroon, during school shut down as a result of the COVID 19 pandemic. The study incorporated a descriptive survey, guided by three objectives that assessed resource availability, teacher competence and the possibility of effectively teaching practical skills online in the Cameroon context. It made use of two closed ended questionnaires, one for the teachers and the other for the students as well as an interview guide for the teachers. A total of 305 participants took part in the study from 5 Higher Education professional institutions made up of 258 students and 47 teachers. The students' questionnaire was validated by 15 students who did not constitute part of the sample and the teachers' questionnaire was validated by nine teachers. Only final year students participated in the study based on their willingness. Data were analysed descriptively and findings revealed that generally, the teaching practical skills online was not effective due to constraints like lack of resources and lack of teacher competence. As for possibility, the response was also negative due to electricity cuts, lack of a stable internet and cost on the part of students. Recommendations included the fact that the best approach to teaching practical skills is a blended mode. Also stakeholders must make a conscious effort to provide a conducive environment for online teaching since it has come to stay. Teachers and even students need training to effectively learn online.

Introduction

The acquisition of practical skills is the core of professional/vocational education or training programs. The aim of practical training is to help students develop skills and abilities that support professional studies and prepare them for work later on.Practical skills are gained by applying theory to real-world activities. This method of learning allows students to remember and master a topic for a long time. With the advent of the COVID 19 pandemic leading to school shut down teaching continued online in many countries since advanced technology makes provision for the teaching of practical skills online. However, this may be largely successful only in advanced countries. One of the most challenging areas of online learning is the transfer of practical or technical hands-on knowledge which is an important component of professional training. Cameroon is one of those countries which experienced a school shut down. It has several professional institutions which had to conduct solely online classes during that period. Little or no research has been carried out to find out the experience of students and teachers to ascertain the extent to which practical skills in these professional programs were effectively taught online during the period mentioned above, thus the purpose of this research.

Review of Literature

Many studies have shown that teachers' practical skills like digital competences, directly account for their self-efficacy and innovativeness in dealing with the challenges they face, especially in e-teaching (Bandura, 1997; Shulman, 1987; Tschannen-Moran & Hoy, 2001; Konig, Jager-Biela, & Glutsch, 2020; Alday & Pascual, 2012). Digital competence/literacy "encompasses a set of basic digital skills, covering information and data literacy, online communication and collaboration, digital content creation, safety and problem solving" (Brolpito, 2018, p. 25). This review of literature focuses on online tools for teaching practical subjects, resources for online teaching, teacher competence in online teaching and possibility of teaching practical skills online.

Online Tools for Teaching Practical Subjects

Online tools for teaching practical skills target the acquisition of psychomotor skills. As such, the interest is on online tools that: enable procedural instruction with explicit directions for completing the required steps; afford adequate room for practice and feedback for each step, a couple of steps and then the entire sequence, all in view of making the practice eventually less dependent on directives whether written or verbal; are based more on audio-visual learning; and eventually allow the learners to deal with real world experiences (Fenrich, 2008). Basically, this involves tools that prioritise or at least have the capacity for tutorials and 'do it yourself' (DIY) learning aids.

Ascione (2018) lists some tools and trends that can significantly enhance teaching and learning in a technologically advanced environment. Some of these include: Virtual reality (VR) to enable simulations and training; Augmented reality (AR), which consists of merging VR and digital information which has been overlaid on the actual experiences

(here there are AR's 2D triggers including enhanced books, flashcards and pictures, as well as 3D AR triggers like sky, furniture and statutes); collections of images, videos, and artefacts like TED-Ed videos and TED-Ed lessons; drones, especially their capacity for enhancing hand-eye coordination so as to help develop learners' psychomotor skills; smart speakers like Alexa and Echo, both by Amazon; Google home; and visual enhancements and storytelling apps like Google Arts & Culture. The utility of these tools and trends is their capacity for approximating, replicating or conveying reality/experiences (Burns, 2011); and in this way enhance tutorials and DIY in effectively teaching practical subjects. It might also prove instructive to look at some subject/fields where online tools have been harnessed towards the teaching/learning of practical skills.

Some online tools have been developed and used to facilitate the acquisition of practical skills in the medical field. In the area of dermatological training within the context of the COVID-19 pandemic, the American Academy of Dermatology (AAD), the American Society for Dermatologic Surgery (ASDS) and the American College of Mohs Surgery (ACMS) resorted to the following: live-video conferencing, even though connectivity issues made this intricate in some cases; Dialogues in Dermatology podcasts; webinars; and PowerPoint presentations with audio overlay on online databases (Schneider & Council, 2020). In a non-randomised controlled trial, it was found that the Physiotherapy e-Skills Training Online resource developed by the Neurological Physiotherapy Teaching Team at the University of Sydney, proved very useful for learning (Preston, et al., 2012). The resource had 3 main components: " (i) video-clips of patient-therapist simulations; (ii) supportive text describing the aim, rationale, equipment, key points, common errors and methods of progression; and (iii) a downloadable PDF document incorporating the online text information and a still image of the video-clip for each practical skill" (p. 1). The fact is simply that by "consistently employing principles of effective learning, educators will unlock the full potential of Web-based medical education" (Cook & Dupras, 2004, p. 698); and this is also true of other practical subjects. How the educational activity is designed is more important than the medium used in view of enabling active engagement (Seymour-Walsh, Weber, Bell, & Smith, 2020).

In Engineering, where interaction, practicals and simulations are indispensable, online labs can also be developed to ensure the required experiential approach to the teaching/learning process. These online labs would take either of two forms: virtual labs which "involve simulation software running on a host machine" or remote labs which "involve real equipment that is situated at a remote location" (Mackay & Fisher, 2014, p. 33). Given their potential for guided practice and realistic simulations, these labs "are widely considered an excellent way to share specialized skills and resources over a wide geographic area" (Mackay & Fisher, 2014, p. 33).

This potential of guided practice through video technology has also proven to be very instrumental in student engagement and success in physical education (Casey & Jones, 2011; Cooper & Higgins, 2014). For example, the e-sports courseware based on the Simpson's Psychomotor Domain Taxonomy – perception, set, guided response, mechanism, complex overt response, adaptation and originality – proved to be very effective in the e-learning of triple jump (Shariffudin, Mislan, Wong, & Julia, 2011). In fact, Casey and Jones (2011) found out that the use of video technology was so successful in enhancing engagement that the degree of commitment it resulted in, enabled the learners to develop a level of understanding that went far beyond mere technical replication. It enabled the learners to develop rational and well-reasoned inquiries around their learning. This makes sense if one considers the idiom that "seeing is believing" and also the audio-visual propensities of this 'digital generation'.

According to Ngoungouo (2017), the common ICT tools in use, especially in primary and secondary schools in Cameroon include: telephones, computers, and two main online learning platforms – Learning Management Systems (LMS) and Massive Open Online Courses (MOOCs). Unfortunately, neither the students nor the teachers were found to be trained or competent in the use of some scarcely available LMS like Moodle and Claroline; or even Google Classroom. Whereas LMS like Moodle, Claroline, Dokeos, and ILIAS are open-source resources (FAO, 2011) which are good for online project-based learning. Since they allow for live collaboration by means of video conferencing, webcasts, podcasts and other collaborative activities which nurture simulation and guided practice.

The rapid developments in information and communication technologies (ICTs) is the obvious driver of online teaching. However, beyond the technological enablers, there are also public health drivers (as was the case with the COVID-19 pandemic), social factors, personal factors (the teachers and the learners) and administrative as well as curricular factors; and yet all of these are intricately connected to the technological factors. A closer look at each of these, especially how they affect online teaching, proves very instructive.

Teacher Competence in Online Teaching

The aforementioned availability of ICT tools is also associated to teacher readiness for online teaching. This association manifests in two main ways: teachers' digital competence and teachers' educational opportunities to nurture this digital competence. Various studies show that teachers' digital competences directly result in their self-efficacy, which in turn positively influences their adoption decisions towards online teaching and also their innovativeness

towards effectively dealing with the challenges of online teaching (Bandura, 1997; Shulman, 1987; Tschannen-Moran & Hoy, 2001).

The teachers' readiness to adapt to this new way of teaching depends greatly on the practical skills they possess. Unfortunately, especially in Cameroon and other developing countries, most teachers lack these e-teaching related practical skills (Bukaliya & Mubika, 2011; Ngoungouo, 2017). This effectively means that teacher training must intentionally target these practical skills in order to predict the aforementioned outcome. For this reason, the importance of e-teaching related practical skills in teacher training constitutes a current preoccupation. Teachers' e-readiness in terms of their attitudes, trainings and technical skills (Phan & Dang, 2017), is a significantly positive predictor of success to the new paradigm shift to online teaching. According to Phan and Dang (2017), the key elements relevant to this e-readiness of the teachers include "attitudes, technology, competence, pedagogy and methodology, training, and time constraint" (Phan & Dang, 2017, p. 13). Worthy of note is that fact that "skills and attitudes are the most significant factors influencing e-learning readiness" (Rohayani, Kurniabudi, & Sharipuddin, 2015, p. 233) These elements are crucial in the successful adoption of online teaching; and this is what makes teachers' e-readiness a significant factor affecting online teaching

The first area is that of professional engagement by means of "digital technologies for communication, collaboration and professional development" (Fissore, Floris, Marchisio, Rabellino, & Sacchet, 2020, p. 49). This involves the capacity for interaction using various digital technologies, with a keen understanding of the fitting digital communication means within each and every context (Brolpito, 2018). A teacher trying to use WhatsApp to do simulation with their engineering students might be a strong indication of lack of knowledge or skills – lack of digital competence – in the appropriate digital technologies for such communication like Edpuzzle and virtual labs. It must also be remembered that the teachers' communication skills are a strong predictor of the academic achievement of the learners (Khan, Khan, Zia-Ul-Islam, & Khan, 2017) and this is heavily dependent on the teachers' ability to use the right media for the right information.

The next area of teacher competence is that of sourcing, creating and sharing the required digital resources (Fissore, Floris, Marchisio, Rabellino, & Sacchet, 2020). We live in an age of information explosion on a plethora of digital platforms. A teacher who is unable to search, select, or even create and share valuable information and digital resources might not prove very effective in their teaching or even personal research. It seems impossible to overemphasise the importance of a teacher's capacity to unleash the potentials of digital creative resources like educational robotics, game design and coding tools; sourcing, creating, manipulating and sharing them to the learners to give them an enviable e-learning experience. This is why adequate training in information and data literacy, as well as the harnessing of digital creative resources is very important, especially for teachers engaging in e-teaching. It is simply indispensable.

Thirdly, there is the area of "orchestrating the use of digital technologies in teaching and learning" (Fissore, Floris, Marchisio, Rabellino, & Sacchet, 2020, p. 49). The idea here is to harness digital creative pedagogies. This area targets the teachers' competence in the edification of a technologically supported creative learning environment. Teaching strategies like project-based learning and inquiry-based learning could be used in a digital environment to energize the teachers' ability to occasion and facilitate interaction, creativity and collaboration among the learners.

Area four is that of assessment: invigorating assessment by means of digital technologies and strategies (Fissore, Floris, Marchisio, Rabellino, & Sacchet, 2020). Assessment has always been a challenging area of the teaching/learning process, but even more so for the training of the teacher. Often, there is a mismatch between what teacher training teaches and what the teachers need to know about assessment. Discrepancies seem to abound between measurement instruction and classroom-based evaluation. There is the unfortunate presumption that competence in a particular subject equals competence in assessing students in that subject. There also seems to be practical ambiguities in the role and meaning of assessment (Buros Centre for Testing, 1993). These and many other challenges associated with assessment are monumentally compounded by lack of the relevant digital competences by the teachers in an e-learning environment. Measuring and assessing the acquisition of practical skills in an online environment can be a near impossibility for a teacher who lacks adequate e-readiness for that. Therefore, training in digital technologies and strategies related to assessment is of utmost importance.

The fifth area involves "using digital technologies to enhance inclusion, personalization and learners' active engagement" (Fissore, Floris, Marchisio, Rabellino, & Sacchet, 2020, p. 49). Inclusion, personalization and learners' active engagement are very important because research has shown that there is a potential mismatch between the more traditional instructional technology that learners prefer and the "course-learning technology" that teachers prefer (Buzzard, Crittenden, Crittenden, & McCarty, 2011). In some other contexts, learners' preference for Instagram, WhatsApp, TikTok, and FaceBook, does not match the teachers' informed need to use Google Classroom, Zoom, or Virtual reality. All of these are digital technologies. However, if they are not strategically chosen, and carefully harnessed to ensure inclusion, personalization and the active engagement of the learners, they will do a great disservice to the learning process. In other words, these digital technologies must be strategically chosen and the instruction using

them must be thoughtfully designed so that their potentials actually result in effective e-teaching and effective learning. If the learners as not sufficiently empowered, the e-learning process would not be effective. This heavily relies on the teachers' digital competence; hence, the need for training in this area too.

Finally, the sixth area requires "enabling learners to creatively and responsibly use digital technologies for information, communication, content creation, wellbeing and problem-solving" (Fissore, Floris, Marchisio, Rabellino, & Sacchet, 2020, p. 49). This primarily focuses on the teachers' competences in enhancing the digital creative competences of the learners: the ability to enable the learners use the available digital technologies both creatively and responsibly. This also involves the ability to diagnose and solve problems connected to teaching and learning in digital environments (Brolpito, 2018). This could range from troubleshooting to basic coding or configuration on/of advanced learning platforms like Edpuzzle, and Augmented reality platforms. Lack of competence in this area usually pushes teachers to settle for suboptimal learning platforms and so lower the quality of the learning that occurs. The bottom line is that training digitally competent teachers goes a long way to producing digitally competent learners.

Possibility of Teaching Practical Skills Online

Various factors make the teaching of practical skills online possible or not. There is the issue of the learners' e-readiness. Recent research shows that the "learner characteristics are the significant predictors of the quality of e-learning" (Elumalai, et al., 2020, p. 744; Kintu, Zhu, & Kagambe, 2017). Top among these learner characteristics are learners' attitude towards e-learning and digital skills. The learners' mastery of the available ICT tools and their openness to collaborative learning, alongside multimedia teaching and learning, positively predict the quality of e-learning (Elumalai, et al., 2020; Goh, Leong, Kasmin, Hii, & Tan, 2017; Sarabadani, Jafarzadeh, & ShamiZanjani, 2017). In other words, the learners' e-readiness – in terms of their attitudes towards the drivers of e-learning and their digital skills – strongly affects online teaching. Interestingly, Chen and Huang (2018) found out that "irrespective of the learning styles of learners, the impact of utility value on network teaching merits consideration, that is the greater relationship there exists between the learning task and the current or future work prospects, the better the learning effect will be" (p. 1641). This also means that perceived added value of the e-learning environments positively drives e-readiness and this significantly affects online teaching. This is also a pointer to the curricular content and design.

Perceived added value (Mahdizadeh, Biemans, & Mulder, 2008) of the curriculum will also significantly affect online teaching. It is clearly more intricate to design curricular for e-learning for some subjects than others. Nevertheless, all subjects can be designed in such a way that the utility value is more evident; this will significantly affect the online teaching. All subjects/fields can have their educational activities designed in a way that makes the perceived value added more apparent and so enhance the active engagement of the learners' engagement (Seymour-Walsh, Weber, Bell, & Smith, 2020). This definitely requires administrative support, especially in order to ensure availability of the required technological dispositions, ensure a positive learning atmosphere in addition to institutional policies that enhance e-learning and the teachers' morale (Elumalai, et al., 2020). All of these have significant effects on the teaching as well as learning in e-learning environments.

Finally, there are also many factors that very negatively affect online teaching including: "lack of face-to-face interactions, lack of socialization, distraction by social media, technology related issues etc" (Shetty, Shilpa, Dey, & Kavya, 2020, p. 1); and significant lack of internet connectivity in Cameroon and other developing countries. This is the reason why the teacher must pay much attention to the socio-cultural, psychological and other backgrounds that can be harnessed to heighten or mitigate the effects of these factors on online teaching.

Statement of the problem

The acquisition of practical skills is the core of professional/vocational education or training programs because the aim of practical training is to help students develop skills and abilities that support professional studies and prepare them for work.Even thoughadvanced technology makes provision for the teaching of practical skills online,Cameroon does not seem to have the appropriate environment for the teaching of practical skills online. However during the period of school shut down due to the COVID 19 pandemic, teachers were called upon to teach online. Even the professional schools that were science/technology oriented and geared toward practical skills offered classes online. It is not known if these skills were effectively taught online. If not what were the constraints and what are the possibilities based on their experiences? Answers to these questions will guide policy with regard to managing teaching in future during similar circumstances in order to ensure quality.

Research Questions

The study which set to assess the effectiveness of teaching practical skills online set out to answer the following questions:

- Are the resources for teaching practical skills online available?
- To what extent are teachers competent in the teaching of practical skills online?
- What is thepossibility of teaching practical skills online in Cameroon?

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Methodology

The study was a descriptive survey that made use of mixed methods. It sought to ascertain the effectiveness of the teaching of practical skills online in professional schools of the English-speaking sub-system of education in Cameroon from where constraints and possibilities will be identified. 47 teachers and 258 students bringing it to a total of 305 participants who participated by choice were purposively selected from five professional schools namely: The Higher Technical TeacherTraining College HTTTC), Kumba, The Higher Technical Teacher Training College (HTTTC), Bamenda, The Higher Teacher Training College (HTTC) Bamenda, The College of Technology (COT), University of Buea and The National Higher Polytechnic Institute (NAPHI), Bamenda as follows: Two closed- ended questionnaires made up of 17similar items from a review of literature on the availability of resources, teacher competence and the appropriateness of teaching practical skills online. The questionnaire was validated by 15 students and 9 teachers who did not take part in the study.47 teachers were also interviewed on the appropriateness of teaching practical skills online. Data were analyzed descriptively, using percentages, means and standard deviation.

Findings and Discussion

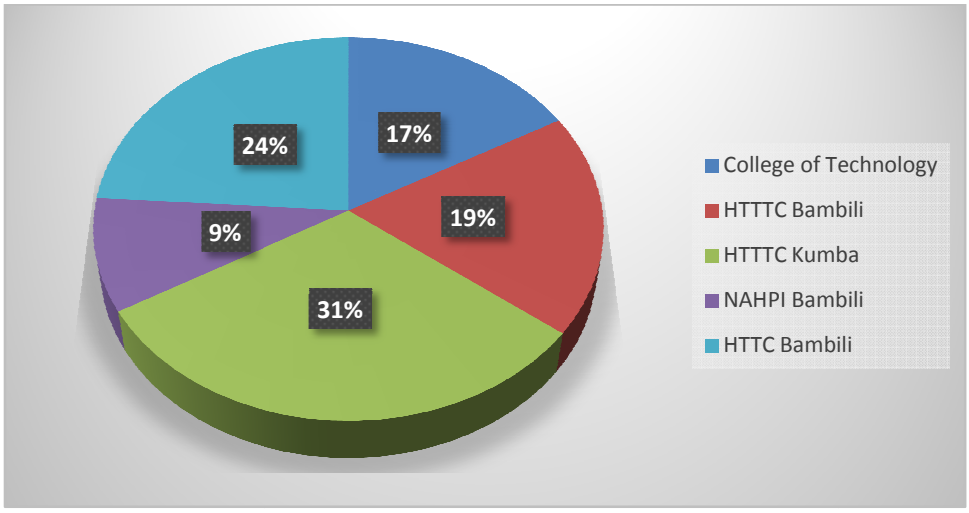
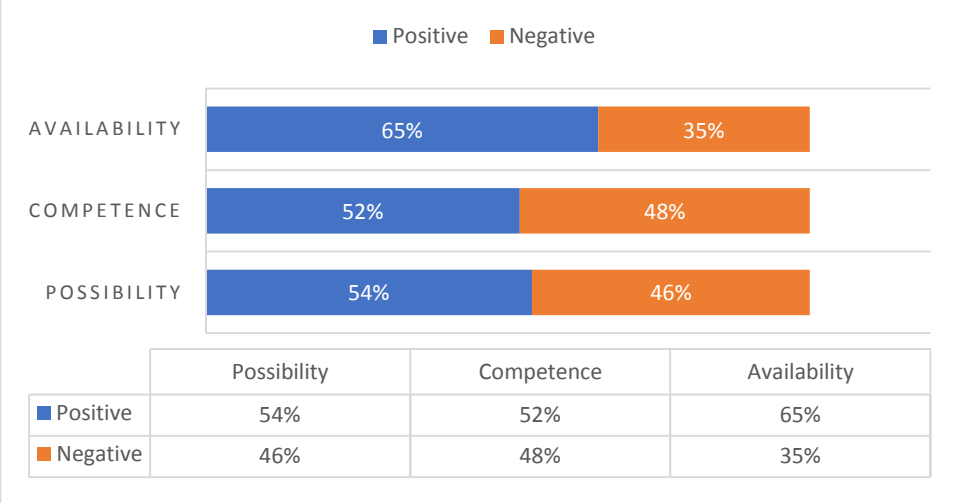


Figure 1: Respondents' Institutions/Schools

This chart shows the respondents in the various schools from which the sample population was drawn. 17% were from the College of Technology of the University of Buea. 19% were from HTTTC Bambili while 31% were from HTTTC Kumba. 9% were from NAHPI Bambili and finally, 24% were from HTTC Bambili.



	Possibility	Competence	Availability
Positive	54%	52%	65%
Negative	46%	48%	35%

Figure 2: Responses of the students

The above figure shows the responses of the students. Students were generally more positive about the teaching of practical skills online. 65% of the students interviewed believed that the required resources for online teaching of practical activities are available. 52% of them believed that the teachers have the required competences in teaching practical skills online. 54% of them said that it is possible to teach practical skills online.

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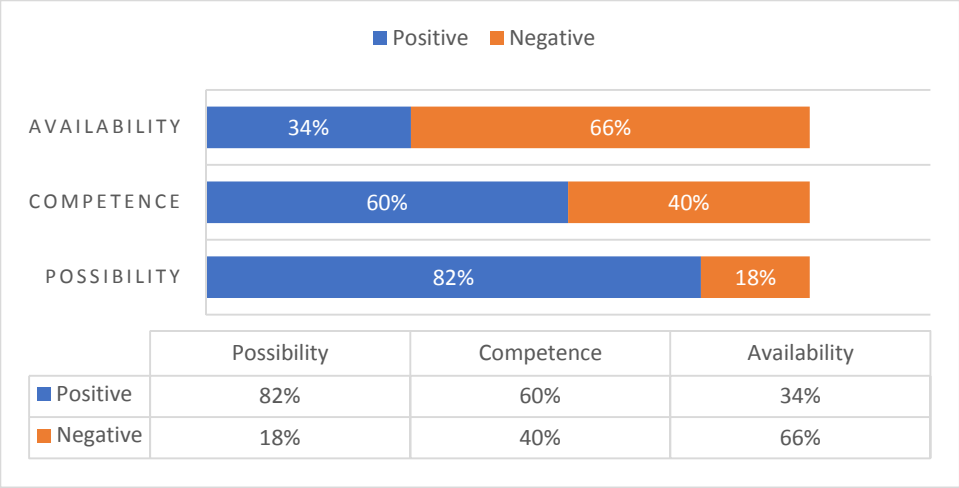

Figure 3: Responses of the Teachers

This chart shows the responses of the teachers. Although 82% of the teachers believe that it is possible to teach practical skills online, only 34% stated that the required resources for online teaching of practical activities were available. 60% claimed that the teachers have the required competences for teaching practical skills online. Therefore, for the teachers, two things came out clearly: firstly, teaching practical skills online is very possible but the required resources are largely unavailable.

Having thus examined the frequency distributions as seen above, it would was appropriate to now turn to the descriptive statistics of the three indicators. This can be seen on the table below:

Table 1: Descriptive statistics for all the indicators

Descriptive Statistics for the three indicators			
	Possibility	**Competence**	**Availability**
Mean	2,46229508	2,26229508	2,39672131
Standard Error	0,03798988	0,04115151	0,04609383
Median	2	2	2
Mode	2	2	2
Standard Deviation	0,66346477	0,71868024	0,80499412
Sample Variance	0,4401855	0,51650129	0,64801553
Kurtosis	-0,20027961	-0,69023536	-0,52321185
Skewness	0,03716493	-0,2235214	-0,04127372
Range	3	3	3
Minimum	1	1	1
Maximum	4	4	4
Sum	751	690	731
Count	305	305	305

For the sake of this study the focus will be laid on two main measures of central tendency (mean and mode) and one measure of dispersion – standard deviation. One way to interpret the mean is to determine the maximum and minimum range applicable to each response, in a way that is consistent with the initial coding. This frame of reference is determined as follows:

- From 0 to 1.5 represents “Strongly Disagree”
- From 1.6 to 2.5 represents “disagree”
- From 2.6 to 3.5 represents “agree”
- From 3.6 to 4 represents “Strongly agree”

Given that the mean scores for all the indicators fall between the zone of 1.6 to 2.5 we could make three conclusions: that the respondents averagely disagree that teaching practical skills online in English-speaking Higher Education institutions is possible; that they averagely disagree that there is teacher competence for such teaching; and finally, that averagely speaking, the required resources for teaching of practical skills online in English-speaking Higher Education institutions are not available.

Secondly, the mode for all the indicators is 2 which corresponds to "Disagree". This means that the most frequent response was "Disagree" and this is consistent with the aforementioned interpretation of the mean as well as the responses to the open-ended item seen below.

Finally, the standard deviation for all is below 1. That is considered as a low standard deviation meaning that there is low variation in the observations. In otherwords, there is somewhat homogeneity in the observations. This is to be expected since the respondents were either teachers or students within similar fields of study in the Sciences or Engineering. It is therefore understandable that they have some homogeneity in opinion.

It is worth noting that these descriptive statistics tell a story consistent with the frequency distributions as shown above. It might prove instructive to now turn to the interview of teachers to see if they provide more details for the general trend of the results. Only one question was asked relating to possibility:

"Do you think you can successfully teach practical skills online in your context? Justify your answer**".**

The 47 teachers interviewed provided responses to this item. 38 (80%) of them said they can't successfully teach practical skills online in their context, while only 9 (20%) of them said they can if certain conditions are met. According to the latter, since it is very advantageous to teach practical skills online in their context, if the required materials and infrastructure are made adequately available, then practically skills could be successfully taught. For the overwhelming majority (80%), there are five main reasons why successfully teaching practical skills online in their context was impossible. These main reasons which are considered constraints include the following:

1. Lack of availability of the required resources: inadequacy of materials and lack of laboratories.
2. Challenges related to unreliability of electricity and internet connectivity
3. Practical skills require face-to-face encounters, supervision/directives and hands-on experience.
4. Work at home will not be taken seriously
5. Cost (of internet) on the part of students
6. Lack of interest as a result of distance.

Based on the findings above, students seemed to be positive about the teaching of practical skills online. This may be due to the fact that being a maiden experience and not knowing the standards for teaching practical skills online, they appreciated what they got. Research reveals thatin Cameroon and other developing countries, most teachers lack these e-teaching related practical skills (Bukaliya & Mubika, 2011; Ngoungouo, 2017). Therefore what they are satisfied with seem to be very basic. Teachers in Cameroon are not trained or competent in the use of some LMS like Moodle and Claroline; or even Google Classroom. Whereas LMS like Moodle, Claroline, Dokeos, and ILIAS are open-source resources (FAO, 2011). In engineering for example, where interaction, practicals and simulations are indispensable, online labs can also be developed to ensure the required experiential approach to the teaching/learning process. These online labs would take either of two forms: virtual labs which "involve simulation software running on a host machine" or remote labs which "involve real equipment that is situated at a remote location" (Mackay & Fisher, 2014).Their responses contradicted those of the teachers whose responses were actually negative with regard to the availability of resources. Being more knowledgeable about the standards for teaching practical skills online in terms of resources they believed that the resources were not availabledepends greatly on the practical skills they possess. However, Table 1 which gives a more detailed account of the responses reveals that the respondents averagely disagreed that teaching practical skills online in English-speaking Higher Education institutions is possible; that they averagely disagreed that there is teacher competence for such teaching; and finally, that averagely speaking, the required resources for teaching of practical skills online in English-speaking Higher Education institutions are not available. This shows that there are constraints in the teaching of practical skills online in Cameroon with regard to teacher competence and the availability of resources. If this trend continues students may not acquire the skills for the world of work which will significantly affect societal development.

Conclusion and Recommendations

There are constraints in the teaching of practical skills online in Cameroon with regard to teacher competence and the availability of resources, narrowing down the possibility of online teaching of practical skills. Based on the findings and discussions, since online teaching has come to stay,the following recommendations should be considered: For now a blended mode should be used in teaching in regular classes, so that students and teachers start acquiring the necessary skills. Teacher training must intentionally target these practical skills in order to predict the aforementioned outcome since teachers' digital competences directly result in their self-efficacy, which in turn positively influences their adoption decisions towards online teaching and also their innovativeness towards effectively dealing with the challenges of online teaching (Bandura, 1997; Shulman, 1987; Tschannen-Moran & Hoy, 2001). Teachers should also make personal efforts to upgrade their skills in teaching practical skills online. Also stakeholders must make a conscious effort to provide an enabling environment for online teaching that will not compromise quality. Institutions need to install an LMS system and gradually move to more complex infrastructure that can permit the use of virtual laboratories. On the part of government, ensuring stable electricity and internet are essential in enhancing online

teaching. In executing corporate social responsibility, the communities can participate through donations or permit the use of some community resources to enhance online teaching of practical skills because online teaching has come to stay.

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