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## **Online Teaching of TVET Courses: An Analysis of Botswana Private Tertiary Education Providers' Responsiveness to the Covid-19 Pandemic Learning Disruptions**

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### **Abstract**

With the spread of COVID-19, education and training institutions around the world have moved towards online instruction to ensure the continuity of learning for students at a distance. Transition to an online environment poses special challenges in the delivery of TVET courses, which involve the development of hands-on skills as well as theoretical learning. The transition poses further challenges for developing countries in terms of the preparedness of training systems and the availability of digital technologies for online teaching. This paper presents the findings of research concerning the readiness and prevalence of Botswana Private Tertiary Education Providers (BAPTEP) for using online teaching platforms during the COVID-19 pandemic. A quantitative research design was used to gather data from a purposive sample of 119 participants from 4 BAPTEP colleges, comprising 18 TVET lecturers and 101 TVET students. Online questionnaires containing both closed-ended and open-ended questions were used, both to respect social distancing requirements and to obtain responses quickly. Descriptive statistics were then used to analyse and present the results, which exposed significant gaps in the preparedness of institutions, lecturers and students. Most BAPTEP institutions were not prepared in terms of having e-learning platforms in place, whilst most lecturers lacked preparation and training in using the online platforms to deliver emergency remote teaching. The results also revealed that many students encountered challenges to engaging in e-learning owing to lack of internet connectivity, lack of a computer or laptop, and inadequate training in the use of their college's online learning platform. Based on the findings, the paper makes recommendations for supporting the transition to online teaching of TVET courses in Botswana.

***Keywords:** Online teaching, e-learning, flexible learning, institutions, skills development, digital technology*

### **1 Introduction**

The COVID-19 pandemic has forced many education and training institutions around the globe to switch from traditional face-to-face classes to e-learning methods. On the one hand, the shift to e-learning strategies was intended to avoid the spread of the disease by effecting social distancing to a greater extent than is possible in traditional face-to-face settings (BQA 2020). On the other hand, e-learning was meant to ensure the continuity of learning during the closure of schools due to the pandemic. In many countries, this has meant that interactive learning could be offered using Learning Management Systems (LMS). At the same time, practical skills training through workplace-based learning (WBL) was often interrupted by company closures (World Bank 2020). In countries that adopted online learning strategies before the pandemic, it has been possible to

support work-based learners through use of e-learning materials (Harriden 2017; World Bank 2020). Online learning has in some cases improved access and enrolment opportunities due to its affordability and flexibility compared to school-based learning (Gannon 2020). Yet, despite concerted efforts, the integration of online technologies in the delivery of TVET has not been realised in many countries and TVET institutions (UNESCO 2020). For many learners, the COVID-19 outbreak posed not only a health threat, but also delayed their completion of studies and transition to employment (WHO 2020).

In Botswana, private tertiary institutions stepped up efforts to ensure continuous learning in the TVET sector, complementing coordinated strategies at the national level to provide inclusive e-learning opportunities (BQA 2020). These initiatives were implemented in close cooperation with the national quality assurance body, the Botswana Qualifications Authority (BQA). Update bulletins from BQA indicate that some Education and Training Providers (ETPs) started online lessons using e-learning platforms to deliver programmes. Even in cases where e-learning was not approved at the time of launching training programmes, BQA regarded the initiative as a temporary mitigating measure to minimize disruptions to teaching and learning during the lockdown (BQA 2020). However, BQA informed ETPs that they would also be required to implement mitigating strategies when they reopened, to assist learners who had not benefited from online learning.

At the national level, BQA has provided operational guidelines for ETPs in response to the COVID-19 pandemic (see [www.bqa.org.bw](http://www.bqa.org.bw)). These guidelines were meant to assist ETPs in developing learning strategies to mitigate disruptions to teaching and learning and to ensure that learners have access to proposed new modes of instruction for content delivery during the lockdown period. The guidelines stipulate that ETPs must:

- Consider their individual settings and capacity when determining alternative, appropriate, and effective learning programme delivery solutions.
- Try to ensure that learners have access to the required learning resources in consultation with key stakeholders (sponsors, parents, learners, and internet providers, amongst others).
- Provide training and support to teaching staff for the changed delivery mode.

This paper presents the findings of research concerning the preparedness of Botswana Association of Private Tertiary Education Providers (BAPTEP) to respond to the need for online teaching of TVET courses during the disruptions caused by the COVID-19 pandemic. In Botswana, private TVET providers tend to be more responsive to changes in the labour market than public institutions – by, for example, regularly updating curricula to reflect new skills needs and establishing linkages with employers to improve the employability of graduates (Kishun 2015). This paper discusses the importance of online teaching methodologies, evaluates the readiness of BAPTEP institutions to teach TVET courses online, and highlights the challenges faced by institutions to effectively use the online teaching platforms that have been established. The paper concludes with recommendations for supporting BAPTEP institutions' transition to e-learning – a mode of delivering TVET that is likely to become inevitable in the future.

## 2 Benefits and Challenges of Online Learning Approaches in TVET

Blended learning is defined as the use of new technologies to combine face-to-face teaching with e-learning or mobile learning (Lam & Ng 2020). The method involves multiple learning venues, pedagogical strategies and elements of instructions (Bates 2015). Burns (2011) posits that the advantage of blended learning is not only in the media used, but also in its variety in terms of content, pedagogy and learning approaches. Combining face-to-face and online learning approaches can produce greater positive impacts than instruction using just one of these delivery modes.

The reasons for and advantages of using online teaching and learning platforms in TVET are numerous (Carr et al. 2018; Kanwar 2019). For example, Hartel (2017) points out that adoption of e-learning is likely to improve the ICT competencies of TVET learners, thereby enabling them to operate more effectively in a future of work characterised by greater automation as a consequence of the Fourth Industrial Revolution (UNESCO 2020). In addition, online teaching platforms allow for distance and flexible learning, catering to learners with different work schedules, circumstances, styles and needs (Kanwar 2019). Several studies have shown that online learning has the potential to improve access to education and increase institutional enrolments (Dhawan 2020; UNESCO 2020; World Bank 2020). For example, the Open Training and Education Network (OTEN) in Australia increased its enrolments from 35,813 in 2006 to 118,060 in 2014 by expanding the range of online VET qualifications that it offers to more than 250 (Harriden 2017). Online training can also reduce the amount of time spent in class-based training. In Canada, online teaching enabled Red River College in Manitoba to allocate 80-85% of time in its four-year apprenticeship programs to practical work-based learning, with 15-20% of time allocated for college-based learning (Little 2017). E-learning can also lower the cost of study and thereby build more inclusive societies (UN 2020). Finally, digital learning environments can enable teachers to work with experts outside of their local area to enhance the quality and relevance of their online training provision (Corbeil & Corbeil, 2015; Hartel 2017; UNESCO 2020).

Just as blended learning enables learning from more than one venue using more than one method, TVET can also be assessed from different venues, with schools responsible for theoretical assessments and workplaces responsible for practical assessments. Online teaching platforms offer an efficient way of transferring workplace-based assessment decisions to the main campus for merging with theoretical assessments (Lam & Ng 2020). These assessment decisions may be transmitted electronically to central institutions, which are then responsible for coordinating all points of assessment until certification of the learner, including by orienting learners in the use of online platforms from the onset (Hartel 2017). Apprentices and TVET learners undertaking WBL can continue to be supported by their institutions through e-learning materials (e.g., simulations and online skills manuals), while student diaries and logbooks can be logged online to build e-portfolios of evidence, which can then be shared on e-learning platforms to assist staff in reaching practical assessment decisions (Harriden 2017).

To fulfil its potential, blended learning requires plenty of resources that should complement each other in the teaching and learning cycle of TVET courses, both in schools and in the workplace (ILO 2020). Harriden (2017) points out that online learning involves a team of competent human resources, comprising full-time school-based teachers, part-time teachers, and offsite teachers. In

situations where online teaching fully engages industry-based experts, resources to support teaching and learning, together with assessments, must be provided in the workplace. These resources should include internet services and the digital equipment necessary to allow industry experts to participate in content writing and assessments and to ensure the transfer of current industry experiences (Hartel 2017). Online teaching and learning also require infrastructural resources, including internet connectivity, computer/laptop, webcam, headset and printers (Bates 2015).

Successful transition to e-learning also depends on teacher, student and institutional readiness (UNESCO 2020; Modesto & Tau 2006). In terms of institutional preparedness, a study by Kibata (2013) of Kenya's TVET institutions found that some institutions lacked the infrastructure and resources necessary to support e-learning. The same study also revealed a lack of computer literacy amongst students and staff. Several studies have identified lack of teacher preparedness to be one of the core challenges in shifting from traditional teaching methods to modern ICT-based teaching methods (UNESCO 2017; Carr et al. 2018). In some cases, teachers lack the preparation and training to deliver practical skills training online (Richardson 2012). In other cases, teachers are resistant to change and view preparation of online teaching materials and associated assessment as extra work (UNESCO 2020). High levels of motivation and a willingness to acquire new skills are required among teachers, assessors and learners for a smooth transition to online instruction (Carr et al. 2018). TVET institutions also need to be creative to develop and continuously improve their e-learning strategies within their available resources of manpower, facilities, and technological platforms (UNESCO-UNEVOC 2020).

### **3 Research Focus and Methodology**

To assess how well private tertiary TVET institutions in Botswana were prepared for the shift to online teaching methodologies during the COVID-19 learning disruptions, a quantitative research design was used to gather data from a purposive sample of 119 participants (18 TVET lecturers and 101 students) from 4 BAPTEP colleges using online questionnaires containing both closed-ended and open-ended questions. Online questionnaires were used, both to observe COVID-19 protocols of social distancing and to reduce the time required for data collection. To ensure anonymity, participants were instructed not to write their names on the questionnaires and were assured that their responses would be kept confidential and used only for the purpose of this study.

Permission to conduct the research was sought from the Ministry of Tertiary Education Research Science and Technology, and the research permit was used to obtain permission from each college to distribute questionnaires to its lecturers and students. The researchers believed that the selected participants were those best placed to provide insights on the readiness of TVET colleges in implementing online teaching during COVID-19 disruptions of face-to-face lectures, since the participants were directly affected by the disruptions. Participating students and lecturers were also invited to share their experiences and provide recommendations for improving e-learning strategies.

Research questions were designed based on a literature review and were especially influenced by Criteria 10 and 14 of BQA's Learning Programme Accreditation guidelines concerning the quality and appropriateness of institutions' infrastructure and resources (BQA 2020). Criterion 10 focuses

on how institutions anticipate delivering registered programmes, and it is at this stage where institutions highlight their intention to offer online teaching. To gain accreditation, qualifying institutions must prove they have the infrastructure in place to support the online delivery mode. Criterion 14 seeks to establish whether ETPs have the capability and capacity to sustain delivery of e-learning programmes. One of the clauses for the criterion stipulates that institutions must “ensure prescribed resources, inclusive of library facilities, internet access and online resources, are consistent with the provision typical of learning programmes leading to the qualification type to be offered” (ibid.).

The following questions guided the study:

- To what extent were BAPTEP institutions ready to offer online teaching and learning?
- To what extent are online teaching methodologies supported in BAPTEP institutions?
- Are online methods used to assess TVET courses?
- What challenges do BAPTEP institutions face in the use of online TVET delivery?
- Do institutions have an adequate infrastructure and resources to facilitate online teaching and learning of TVET courses?

In terms of data analysis, descriptive statistics were used to analyse the results of closed-ended questions, while responses to open-ended questions were thematically analysed.

## **4 Results and Discussion**

### **4.1 BAPTEP Institutions’ Readiness to teach TVET courses online in Botswana**

Student responses to the questionnaires suggest that most of BAPTEP institutions included in the study did not have online teaching and learning platforms for TVET courses in place prior to the COVID-19 pandemic (see Table 1). Only just over one-third (33.6%) of students surveyed agreed that their college had online teaching platforms for TVET courses, while only 26.7% agreed that an LMS had been in place. An even lower percentage (16.8%) agreed that students were trained in the use of the LMS, suggesting that even where LMS were in place, they were not being effectively utilised. These issues do not seem to stem predominantly from students’ unwillingness to engage with new technologies, since over 40% of students responding to the survey agreed that online platforms can be effectively used to teach TVET courses (46.5%) and that online methods are effective for delivering TVET teaching material (41.6%) as well as for assessing TVET courses (46.5%). Most student surveyed (37.7%) also agreed that the content of TVET courses delivered online tend to be of acceptable quality. Students’ responses indicate that a key reason why online methods were not more widely employed in delivering TVET courses in Botswana prior to the COVID-19 pandemic was a lack of adequate infrastructure and resources on the part of students (56.4%) and/or TVET institutions (40.6%).

**Table 1: Students' responses on College Level of Preparedness (n=101)**

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The College had Online teaching platforms for the TVET courses before the COVID - 19 Pandemic.	20	26	21	28	6
	19.8%	25.7%	20.8%	27.7%	5.9%
There was a LMS being used in the College before the outbreak of COVID-19.	18	26	30	20	7
	17.8%	25.7%	29.7%	19.8%	6.9%
Students were aware of the LMS.	21	21	24	28	7
	20.8%	20.8%	23.8%	27.7%	6.9%
All students were trained on the use of the LMS.	31	26	27	10	7
	30.7%	25.7%	26.7%	9.9%	6.9%
Online Platforms can be effectively used to teach TVET courses.	13	16	25	38	9
	12.9%	15.8%	24.8%	37.6%	8.9%
Online method is effective for delivering TVET teaching material.	11	22	26	33	9
	10.9%	21.8%	25.7%	32.7%	8.9%
Online methods can be used to assess TVET courses.	8	16	30	37	10
	7.9%	15.8%	29.7%	36.6%	9.9%
There is Quality in the content for TVET courses delivered online	9	20	34	33	5
	8.9%	19.8%	33.7%	32.7%	5.0%
The College has adequate infrastructure and resources to facilitate online teaching of the TVET courses.	14	27	35	18	7
	13.9%	26.7%	34.7%	17.8%	6.9%
Students have adequate infrastructure and resources to facilitate online learning of TVET courses.	19	38	24	16	4
	18.8%	37.6%	23.8%	15.8%	4.0%

Similar trends emerge from lecturers' responses to questions regarding their colleges' preparedness for the shift to online teaching and learning (see Table 2). However, a higher percentage of lecturers said that their college had online teaching platforms (38.9%) and LMS (44.4%) in place prior to the COVID-19 pandemic, and one-half of lecturers surveyed said they had been trained in the use of the LMS. Nevertheless, they overwhelmingly agreed (77.8%) that students lacked training in the use of the LMS. As with the students responding to the survey, most lecturers agreed that online platforms can be effectively used to teach TVET courses (50%) and that online methods can be effective for delivering TVET teaching materials (44.4%) and assessing TVET courses (61.1%). However, they found fault with their colleges' procedures for assuring the quality of online teaching content for

TVET courses, as well as for monitoring the effectiveness of the use of LMS. As with the students, the lecturers surveyed agreed that their institution – and even more so their students – lack the required infrastructure and resources to facilitate online teaching and learning of TVET courses.

Table 2: **Lecturers’ responses on College Level of Preparedness (n=18)**

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The College had Online teaching platforms for the TVET courses before the COVID - 19 Pandemic.	6	2	3	6	1
	33.3%	11.1%	16.7%	33.3%	5.6%
There was an LMS being used in the College before the outbreak of COVID-19.	3	3	4	8	0
	16.7%	16.7%	22.2%	44.4%	0.0%
Lecturers were aware of the LMS.	3	5	2	6	2
	16.7%	27.8%	11.1%	33.3%	11.1%
Lecturing staff were trained on the use of LMS.	4	5	0	7	2
	22.2%	27.8%	0.0%	38.9%	11.1%
All students were trained on the use of the LMS.	6	8	1	3	0
	33.3%	44.4%	5.6%	16.7%	0.0%
The College has a monitoring tool for the effectiveness of the use of the LMS.	5	3	5	4	1
	27.8%	16.7%	27.8%	22.2%	5.6%
Online Platforms can be effectively used to teach TVET courses.	2	2	5	7	2
	11.1%	11.1%	27.8%	38.9%	11.1%
Online method is effective for delivering TVET teaching material.	2	4	4	8	0
	11.1%	22.2%	22.2%	44.4%	0.0%
Online methods can be used to assess TVET courses.	3	2	2	11	0
	16.7%	11.1%	11.1%	61.1%	0.0%
There is Quality Assurance of online teaching content for TVET courses in the college.	6	2	6	3	1
	33.3%	11.1%	33.3%	16.7%	5.6%
The College has adequate infrastructure and resources to facilitate online teaching of the TVET courses.	4	4	4	5	1
	22.2%	22.2%	22.2%	27.8%	5.6%
Students have adequate infrastructure and resources to facilitate online learning of TVET courses.	5	6	5	1	1
	27.8%	33.3%	27.8%	5.6%	5.6%

## 4.2 Lecturers’ and Students’ Readiness for Online Learning

In terms of what infrastructure and resources students lack, most students responding to the questionnaire cited lack of internet connectivity (70.3%) more so than lack of access to a computer or laptop – although over one-third (35.7%) of students surveyed said they do not have a computer

or laptop to operate from home (see Table 3). In line with their earlier responses, most students surveyed (61.4%) said they had not often used their college’s LMS prior to lockdown and that, due to lack of internet connectivity and/or access to a computer or laptop, they experience difficulties accessing or using the LMS at home (48%). Most (around one-half) rely on the internet, rather than their college’s LMS, for e-learning.

Table 3: **Students’ Readiness for Online Learning (n=101)**

	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly Agree</b>
<b>I have Internet connectivity at home.</b>	31	40	4	13	13
	30.7%	39.6%	4.0%	12.9%	12.9%
<b>I have a computer / Laptop to operate from home.</b>	15	21	14	33	18
	14.9%	20.8%	13.9%	32.7%	17.8%
<b>I frequently used the LMS before the COVID-19 pandemic</b>	22	40	22	10	7
	21.8%	39.6%	21.8%	9.9%	6.9%
<b>I have no difficulty in accessing and using the LMS at home.</b>	24	24	27	12	13
	24.0%	24.0%	27.0%	12.0%	13.0%
<b>I find Online learning of TVET courses to be effective.</b>	14	19	34	25	9
	13.9%	18.8%	33.7%	24.8%	8.9%
<b>I am competent in the use of Internet for e-learning</b>	10	19	22	33	17
	9.9%	18.8%	21.8%	32.7%	16.8%
<b>I recommend the LMS we are using to other Colleges.</b>	12	19	33	19	18
	11.9%	18.8%	32.7%	18.8%	17.8%

TVET lecturers, on the other hand, were found to be better-equipped to offer online teaching from home (see Table 4). 72.2% of lecturers surveyed said they own a computer or laptop, 61.1% said they have internet at home, and two-thirds said they have the skills required to interact with learners through the LMS. Nevertheless, a significant proportion – around one-quarter of lecturers surveyed – said they lack internet connectivity and/or a computer/laptop, which makes it difficult for them to access and use the LMS from home. Among those who could access their college’s LMS, the vast majority (55.6%) said they would recommend it to other institutions.



Table 4: **Lecturers' Readiness for Online Teaching (n=18)**

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I have Internet connectivity at home.	2	3	2	5	6
	11.1%	16.7%	11.1%	27.8%	33.3%
I have a computer / Laptop to operate from home.	2	2	1	7	6
	11.1%	11.1%	5.6%	38.9%	33.3%
I have the necessary skills to interact with learners through the LMS.	1	1	4	6	6
	5.6%	5.6%	22.2%	33.3%	33.3%
I have no difficulty in accessing and using the LMS at home.	1	4	4	5	4
	5.6%	22.2%	22.2%	27.8%	22.2%
I find Online teaching of TVET courses to be effective.	1	6	6	4	1
	5.6%	33.3%	33.3%	22.2%	5.6%
I recommend the LMS we are using to other Colleges.	2	3	3	5	5
	11.1%	16.7%	16.7%	27.8%	27.8%

### 4.3 Challenges faced by BAPTEP Colleges in teaching TVET courses online

In terms of the challenges faced by BAPTEP institutions in teaching TVET courses online, both students and lecturers responding to the questionnaire regarded the main issues as arising from the student side: lack of access to the internet and/or a computer or laptop, and lack of training in using their college's LMS (see Figures 1 and 2). In addition, students are in many cases resistant to changing their mode of learning from traditional methods to online methods.

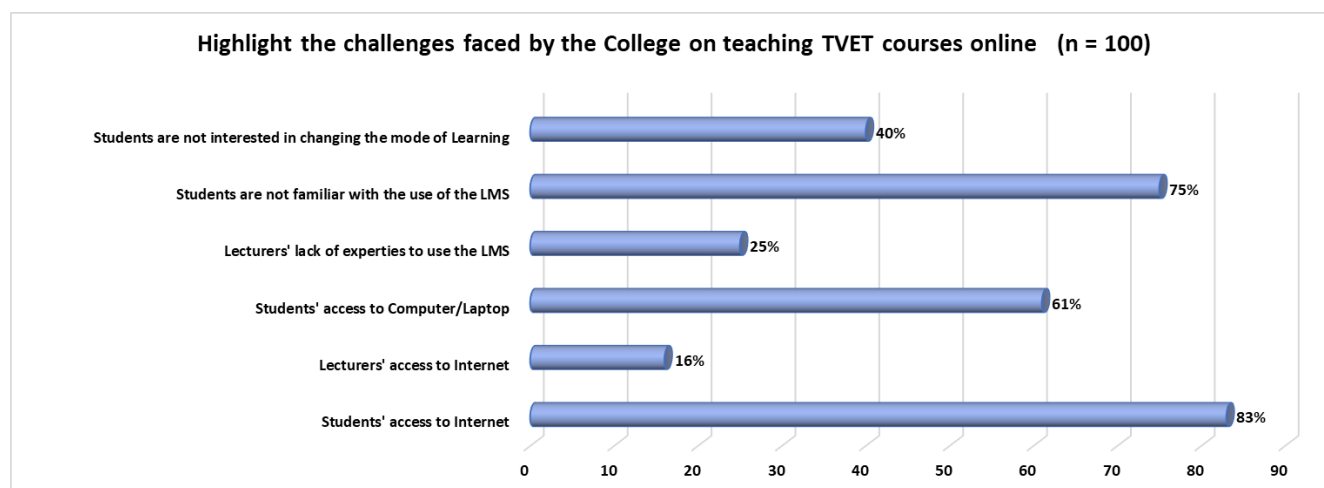


Figure 1: Students' responses on Challenges faced by BAPTEP Colleges on teaching TVET courses online

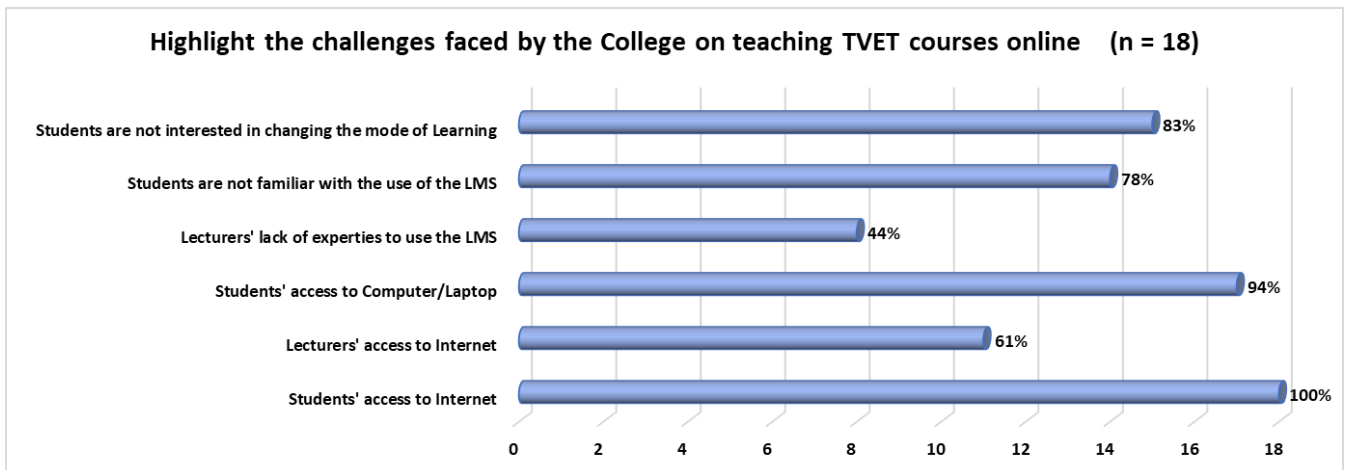


Figure 2: Lecturers' responses on Challenges faced by BAPTEP College on teaching TVET courses online

A further challenge concerns a lack of technical capacity to use online platforms to deliver practical skills training and support WBL. To understand the challenges faced by BAPTEP institutions in providing online practical skills training, students and staff participating in the study were given a list of six limitations and were asked to tick any number that applied to their specific situations. Figures 3 and 4 show their responses. Both the lecturers and students indicated that the e-learning platforms in their institutions lacked virtual workshops for students to receive hands-on practical skills training. Most LMS also did not allow for simulations, further inhibiting practical skills development and students' ability to apply their theoretical learning. Lecturers' lack of training and expertise in using the LMS was also illustrated by the fact that 44% of students and 50% of staff reported lack of interaction between lecturers and students on the online platforms. These issues have grave implications for the relevance of TVET courses and therefore also the employability of TVET graduates.

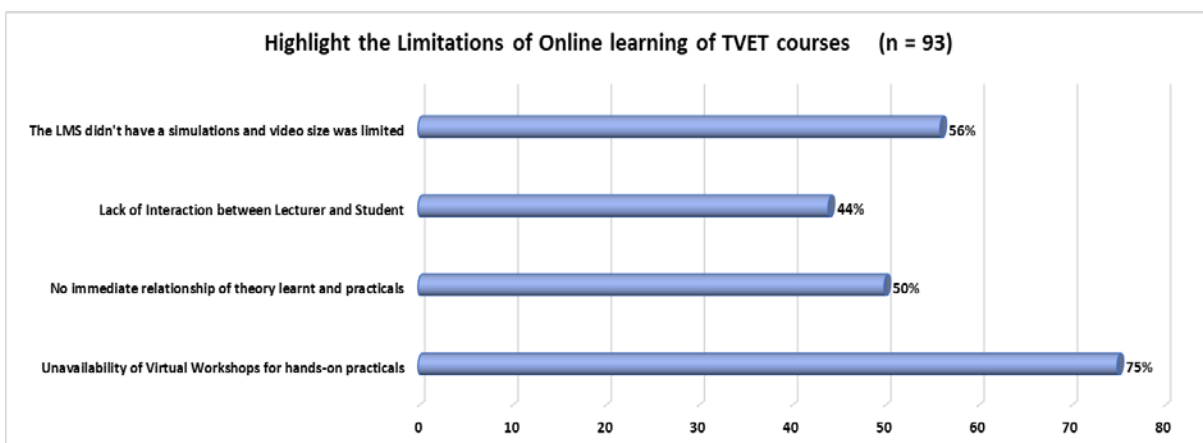


Figure 3: Students responses on limitations of online learning of TVET courses

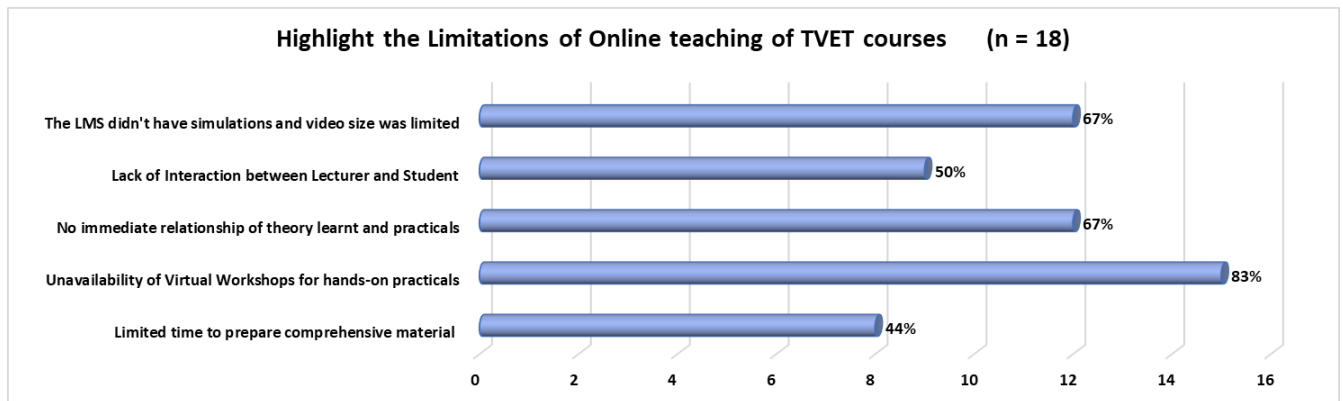


Figure 4: Lecturers' responses on the limitations of online teaching of TVET courses

## 5 Conclusion and Recommendations

The purpose of the study was to evaluate the readiness of private tertiary institutions in Botswana to initiate online instruction of TVET programs during the COVID-19 pandemic learning disruptions. The questionnaire results suggest that most BAPTEP institutions were not ready for the transition to an online environment, despite some colleges having established online teaching and learning platforms before the pandemic. This was confirmed by responses from both students and lecturers, over 40% of whom stated that their college lacked the necessary infrastructure and resources to support e-learning in TVET. Furthermore, a large percentage of the TVET lecturers claimed not to have received training in the use of their institution's LMS, which may have had an impact on their capacity to use the system to deliver hands-on practical training or even to interact with students online. Most TVET students surveyed also experienced challenges in engaging in online learning owing to lack of internet connectivity, lack of a computer or laptop, and/or lack of training in the use of their college's LMS. These issues may explain why many of the students were reluctant to shift to online learning, despite appreciating that online platforms and methods can be effectively used to teach and assess TVET courses.

Based on these findings, the following recommendations are suggested:

- BAPTEP institutions should perform realistic assessments of their readiness to offer online courses and take steps to improve their ICT infrastructure and resources in line with BQA guidelines for e-learning provision.
- Both initial and in-service teacher education should be reformed to ensure that TVET lecturers receive training in the competences needed to work effectively in online and blended learning settings.
- Training on the use of online and blended learning methodologies should be offered to both institutional and workplace assessors and moderators.
- Institutions should seek partnerships/buy-in of industry and employers on the utilisation of online teaching and assessment methodologies for TVET learners in the workplace.
- Colleges should educate students on the use of their LMS and the benefits of online and blended learning.

- Institutions and internet providers should find ways of improving students' access to the internet and computers/laptops.
- Further research is needed on effective models of online teaching and learning in TVET to inform practice.

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