Introduction

**Keywords:** Information and Communication Technologies, integration of ICTs, educational technologies, Open, Distance and Flexible Learning, technical and vocational education and training.

One of the challenges facing Zambian Vocational Training institutions is increased enrolment of geographically distributed students and limited institutional resources to scaffold learning. This challenge is compounded by increasing competition among higher and vocational learning institutions on one hand, and the changing nature of 21st century learners. In response to this challenge, some public Vocational Education Institutions under the Ministry of Higher Education have identified and prioritised educational technologies to have a critical pedagogical role in Open, Distance and Flexible Learning (ODFL) programmes. However, there is still a mismatch between policy intentions and the educators pedagogical practices. Thus, this paper reports on an approach that seeks to build capacity of ODFL educators teaching with educational technologies. The paper seeks to develop a framework for building capacity in the use of educational technologies in Open, Distance and Flexible Learning in Zambian Vocational Colleges by teaching staff to guide Colleges seeking to offer effective ODFL programmes.

The paper discusses the methodology involved in the study which included the phases of monitoring and evaluation of twelve (12) public vocational training and a second phase involved three (3) capacity building workshops conducted in February, March and May 2018. The workshops were held in three provinces. The propositions on the way forward from participants arising from the capacity building workshops were issues surrounding institutional focus, pedagogical focus, technological focus and personal focus. The paper proposes a model for strategic stakeholder participation and regional institutional collaboration in the effective integration of educational technologies in Public Vocational Training Institutions contexts who are offering ODFL programmes.

**Aim**

The aim of the paper is to develop a framework for capacity building in the use of educational technologies in Open, Distance and Flexible Learning Zambian Vocational Colleges by teaching staff to guide Colleges seeking to offer effective ODFL programmes.

**Objectives**

The objectives of this paper are to:

- Identify systems put in place for ODFL delivery and development;
- Identify promising and best practices in ODFL implementation;
- Identify challenges in ODFL implementation and
- Recommend measures to improve ODFL implementation.

**Research Questions**

The study was guided by the following research questions:

- What systems have been put in place for ODFL delivery and development?
- What a some of the promising and best practices in ODFL implementation?
- What challenges do you face in ODFL implementation? and
- Recommend measures to improve ODFL implementation in your institution.

**Literature Review**

The review of literature focussed on key government documents such as the National ICT Policy, draft ODFL Policy Guidelines in TEVET, TEVET Policy and Ministry of Higher Education Strategic Plan and eLearning Report on Zambia, Baseline Survey of ODFL in Zambia and reports on the monitoring of the implementation of ODFL in Southern and Western region, Lusaka & Central region and Copperbelt region.
Some of the innovative uses of ICTs in teaching in TVET are reported by Latchem (2017:27) in initiatives such as the use of low-cost tablets and online and blended learning in remote classrooms in the Philippines, a publicly accessible portal for knowledge sharing by TVET teachers in Germany, and North-South collaboration in online leadership training for TVET involving Germany, Vietnam, Indonesia and Laos. Online and distance learning has and can be used to build capacity of TVET teachers in the use of ICTs in teaching (Latchem, 2017:35). In order to ensure that ICTs are effectively used in TVET teaching there is need to empower and train managers and staff to initiate and lead transformational change. Further, there is need to create international, national and subject repositories and training materials, information, guidelines, case studies and research findings to encourage good practices (Latchem, 2017:222). This is in line with recommendations by Ministers responsible for education in the Qingdao Declaration calling for “a global network of expertise and knowledge-sharing on ICT in education, including specialised Institutes and Centres under the auspices of UNESCO, which would serve the needs of three different user communities – namely policy-makers, researchers and teachers (UNESCO, 2015:3).

Methodology
Monitoring activities to collect data on the implementation of ODFL in TVET institutions in Southern, Western, Copperbelt, Lusaka and Central provinces were conducted in 2017 and 2018. This involved the researcher conducting interviews with 12 members of staff involved in ODFL delivery and management in 12 institutions. An instrument that addresses the research questions in the study as outlined above was used. Permission was sought from the institutional heads to interview the members of staff. After the monitoring activity, reports were developed which led to workshops being held in three provinces i.e. Southern, Central and Copperbelt in order to share and validate the findings with ODFL practitioners from training institutions in these provinces and regions. The workshops were also held to develop a collaborative approach to addressing challenges faced in use of educational technologies in ODFL delivery and in teaching generally. The workshops also encouraged the sharing of best practices and lessons learned by participants that had attended various ODFL and eLearning Conferences. During and before the workshops the use of various technologies and apps such as WhatsApp and Google Docs were used as a way of showing participants how ICTs can be used for collaboration in teaching and learning.

Findings

Systems put in place for ODFL delivery and development
In order to establish the systems put in place for ODFL delivery and development, questions were asked on existence of institutional ODFL policies, monitoring and evaluation of ODFL policy implementation, alignment of ODFL Policy to institutional strategic plan, managers trained in ODFL management, development of staff in ODFL delivery and governance structures for ODFL programmes and delivery.

Institutional ODFL policies available
It was found that 7 of the 12 institutions that were interviewed had institutional ODFL policies in place. The other 5 institutions were at the stage of developing their policies. These 5 institutions would require assistance in developing their ODFL policies.

Monitoring and Evaluation of ODFL Policies
The study found that 5 out of the 12 institutions had monitoring and evaluation policies. This points to the need for capacity building in monitoring and evaluation of ODFL policies. It is important that policies are monitored to see where they are working well and where they are not so that corrective measures are put in place.

Alignment of ODFL Policy to Strategic Plan
A total of 6 out of 12 institutions (50%) had their ODFL policies aligned to their institutional strategic plans. This points to the need to have institutional ODFL plans aligned to the institutional strategic plans.

Managers trained in ODFL Management
A total of 11 out of 12 institutions had their managers trained in ODFL management. This is an encouraging number considering that all the institutions are dual-mode institutions. However, there is need to strengthen the training so that it is appropriate to the needs of a growing ODFL TEVET institution.

Development of Staff in ODFL Delivery
It was found that all the 12 institutions interviewed had staff who had undergone various forms of development in ODFL delivery. This was from organisations such as the Commonwealth of Learning and the Southern African Community Development (SADC). For the training provided by the Commonwealth of Learning, the training was
both offline and online. Such training needs to continue to ensure that staff teaching on ODFL programmes are kept abreast with the latest developments in ODFL delivery.

**Governance Structures for ODFL Programme and Delivery**
A total of 12 out of 12 (100%) of the institutions had governance structures for ODFL programme delivery and delivery. The institutions interviewed had an ODFL unit headed by either a head of department or a co-ordinator. This suggests a well thought out governance structure for ODFL in these institutions.

**Promising and Best Practices in ODFL Implementation**
In order to establish some of the promising and best practices in the institutions that were interviewed, questions asked were:

- Did you conduct a market survey before introducing ODFL programmes?
- What are some of the information and communication technologies used in teaching and learning of ODFL programmes?
- Do you have a quality assurance system in place for ODFL?

**Market Survey**
A market survey was done in 10 out of the 12 (83.3%) institutions. The market survey included visits to employers in selected provinces, visits to institutions that were implementing ODFL programmes.

Some of the responses that were given were:
“Market survey was done especially in Health Sciences”
“Visited some ODFL institutions & did survey in Government Ministries (Secretarial & Water Sector)”

**Quality Assurance**
A total of 9 out of 12 (75%) had quality assurance systems for ODFL. The outworking of these quality assurance systems is seen in some of the responses that were made by respondents:

“All lecturers are required to prepare learning materials before learners’ report for residential classes”.
“The ODL Coordinator and Heads of sections are responsible for ensuring quality assurance. This is done through the academic team for quality assurance”.
“Heads of Section and Heads of Department and Senior Lecturers are involved in ensuring quality assurance at departmental level. Module writing is done by competent lecturers, verified then submitted to verifier Head of Department and finally the training manager. The office is involved in all the above process. Policy has component of Quality Assurance embedded in it.
“There is a committee in place headed by the Training Manager with a team of Heads of Departments and Senior Lecturers”.
“There is a Quality Assurance department comprising staff from all departments”.

**Use of Information and Communication Technologies**
All the respondents interviewed in the 12 institutions used various forms of information and communication technologies (ICTs) at various levels from basic to advanced. The use of ICTs ranged from administrative (sending out of information) to management of teaching and learning for the distance learners. The use of open educational resources (OERs) seemed to be the most common ICT used across all the institutions. For some these OERs were in the form of e-books and videos. Another commonly used ICT was the use of PowerPoint using overhead projectors in teaching. It still remains yet to be established on how effectively this is being used. The study also found the use of WhatsApp for both teaching and administrative purposes. Use of learning management systems such as Moodle was being done in 3 institutions while 1 institution was using Astria Learning. The study also found that the use of social media and email was commonly used for purposes of teaching and learning. The table below gives a breakdown of the various ICTs that were reported as being used in the 12 institutions interviewed.
Table 1: ICT devices used in ODFL programmes

<table>
<thead>
<tr>
<th>No.</th>
<th>ICT used</th>
<th>Purpose used for</th>
<th>College</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Open Educational Resources (e.g. eBooks, videos)</td>
<td>Teaching materials, learning materials</td>
<td>NORTEC LTBC TVTC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Kasiya</td>
</tr>
<tr>
<td>2.</td>
<td>Google Classroom</td>
<td></td>
<td>NORTEC</td>
</tr>
<tr>
<td>3.</td>
<td>Wifi</td>
<td>Communication, eBooks</td>
<td>NORTEC</td>
</tr>
<tr>
<td>4.</td>
<td>LMS (Moodle)&lt;br&gt; LMS (Astria)</td>
<td>Teaching materials, learning materials</td>
<td>ZIBSIP TVTC St. Mawaggali Trades EHC</td>
</tr>
<tr>
<td>5.</td>
<td>PowerPoint</td>
<td>Teaching materials, learning materials</td>
<td>ZIBSIP ITC LBTC ZAMIM LIBES St. Mawaggali Trades</td>
</tr>
<tr>
<td>6.</td>
<td>Smartphones</td>
<td>Learning materials</td>
<td>LTBC</td>
</tr>
<tr>
<td>7.</td>
<td>Social media (e.g. Facebook page)</td>
<td>Learning materials</td>
<td>TVTC EHC Kasiya</td>
</tr>
<tr>
<td>8.</td>
<td>WhatsApp</td>
<td>Sharing information to learners Administration</td>
<td>EHC LBTC Kasiya</td>
</tr>
<tr>
<td>9.</td>
<td>Desktop Computers</td>
<td>Learning</td>
<td>Mongu Trades</td>
</tr>
<tr>
<td>10.</td>
<td>Email</td>
<td>Learning materials distribution</td>
<td>St. Mawaggali Trades Kasiya</td>
</tr>
<tr>
<td>11.</td>
<td>Storage devices (e.g. CDs, USB)</td>
<td>Learning materials</td>
<td>St. Mawaggali Trades</td>
</tr>
</tbody>
</table>

Table 2: Challenges in ODFL Implementation in Lusaka TVET institutions

Challenges in ODFL implementation

Despite some of the promising and best practices that were found in the 12 interviewed institutions, there are some challenges that were identified.

The table below shows the challenges identified in the Lusaka based institutions:

<table>
<thead>
<tr>
<th>Institution</th>
<th>Challenge</th>
</tr>
</thead>
<tbody>
<tr>
<td>EHC</td>
<td>Printing facilities; Capacity in Module Writing; Teachers demanding higher payments for teaching and module writing.</td>
</tr>
<tr>
<td>ITC</td>
<td>Capacity building; lack of exposure; equipment; No incentives for ICT staff</td>
</tr>
<tr>
<td>LBTC</td>
<td>Lack of full utilisation of technology by teachers &amp; learners; Internet (speed/quality/cost)</td>
</tr>
<tr>
<td>ZAMIM</td>
<td>Capacity building; Lack of appropriate equipment (e.g. Internet, communication facilities); management support.</td>
</tr>
</tbody>
</table>

Table 3: Challenges in ODFL Implementation in Southern & Western Region TVET institutions

<table>
<thead>
<tr>
<th>Institution</th>
<th>Challenge</th>
</tr>
</thead>
<tbody>
<tr>
<td>MgTTI</td>
<td>“Financial constraints so the Institute did not have a Learning Management System that students and low enrollments especially in technical programmes. Learning materials production and Internet connectivity challenges”.</td>
</tr>
<tr>
<td>LIBES</td>
<td>“Enrolling adequate students in technical programmes”. “Challenges in completing the learning outcomes”.</td>
</tr>
<tr>
<td>SMTTI</td>
<td>“Failing to enroll adequate number of students”</td>
</tr>
<tr>
<td>KC</td>
<td>“Some students have challenges in accessing the Internet”.</td>
</tr>
<tr>
<td>Institution</td>
<td>Challenge</td>
</tr>
<tr>
<td>-------------</td>
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</tr>
<tr>
<td>NORTEC</td>
<td>Lack of policy, underdeveloped guidelines, training decisions. TEVETA regulations affects implementation, inadequate teaching materials.</td>
</tr>
<tr>
<td>ZIBSIP</td>
<td>Low enrollments in some courses posing a challenge in assessing which courses are economical to run. Lack of trained lecturers in ODFL delivery.</td>
</tr>
<tr>
<td>LTBC</td>
<td>Some students are not able to attend the residential classes making lecturers have to repeat what has already been taught when they have the next residential classes. Some students are not able to pay the tuition fees in full.</td>
</tr>
<tr>
<td>TVTC</td>
<td>Inadequate infrastructure for all the students.</td>
</tr>
</tbody>
</table>

Table 4: Challenges in ODFL Implementation in Copperbelt TVET institutions

From the above it can be noted that low enrolments is the most common challenge with 4 out of the 12 institutions (25%) reporting it as a challenge. Another common challenge was inability to complete learning outcomes as reported by LIBES which is similar to the inability to attend some learners to attend residential classes as reported by LTBC.

Discussion
Based on the findings of the monitoring study the following key issues are discussed.

**Systems put in place for ODFL delivery and development**
ODFL managers and staff in the 12 institutions generally seem to be aware of what systems are required when implementing ODFL. A total of 58.3% having institutional ODFL policies in place suggests that there are some colleges that can be used as models by those in the process of developing their institutional ODFL policies. This could be one way of promoting collaboration through knowledge sharing and sharing of experiences among ODFL institutions.

It is however a source of concern that only 41.7% had put in place monitoring and evaluation systems for the ODFL policies. This points to the need for the Ministry of Higher Education and TEVETA and other stakeholders to build capacity on monitoring and evaluation systems for the ODFL policies. There is also need to build capacity in institutions to ensure that ODFL policies aligned to their institutional strategic plans.

With regards to managers trained in ODFL Management where it was found that 91.7% were trained, this is commendable and something that needs to be built on by the Ministry and other stakeholders. ODFL operates in a sector that has a number of emerging technologies which institutions need to take advantage of to address the needs of learners in resource constrained based contexts.

It is also very commendable that 100% of the institutions that were interviewed reported of their staff having undergone training in ODFL delivery. It should be noted that in most cases this training comprises short online and offline workshops. The Ministry needs to strengthen its’ partnership with current stakeholders and identify new stakeholders who can assist in capacity building of ODFL trainers through various available programmes.

**Governance of Structures for ODFL Programme and Delivery**
All the 12 institutions i.e. 100% had governance structures for ODFL programme delivery and delivery. with ODFL units headed by either a head of department or a co-ordinator. There is need for the institutions to carry out an internal review to see how well their governance structures are working and make necessary adjustments where there are gaps.

**Promising and Best Practices in ODFL Implementation**

**Market Survey**
It was found that 83.3% of the institutions interviewed had conducted a market survey before introducing ODFL in their training institutions. This is useful for institutions as they are able to assess the demand for learning through distance learning, the type of programmes required and get a sense of the profile of their learners. The Ministry and TEVETA needs to build the capacity of institutions in conducting market surveys before and during the introduction of ODFL programmes. Some of this capacity is already available in some training institutions.
Quality Assurance
A total of 9 out of 12 (75%) reported having quality assurance systems for ODFL. This is a fairly good rate for quality assurance. The Ministry needs to ensure that TEVETA supports institutions in building capacity in quality assurance of ODFL programmes. There is also need to support institutions to collaborate on issues of quality assurance of ODFL programmes.

Use of Information and Communication Technologies
All the respondents interviewed in the 12 institutions (100%) reported the use of various forms of information and communication technologies (ICTs) at various levels in the teaching of ODFL programmes. The use of ICTs ranged from administrative (sending out of information) to management of teaching and learning for the distance learners. This finding is in line with studies such as that done by Vasudevaiah (2016:1) who states that with the support of ICTs, thousands of people from remotest parts of India have been able to access education through distance learning.

Regarding the use of open educational resources (OERs) which seemed to be the most common ICT used across all the institutions this is not surprising as OERs are useful in addressing the challenge of access to quality teaching and learning materials in resource constrained contexts. The Ministry and TEVETA needs to support TVET institutions to be able to access, use and adapt OERs for teaching and learning. The Ministry could leverage on organisations such as UNESCO and COL who have provided training in the use of OERs to Zambian TVET trainers before and also have access to useful OER databases. In building the capacity of teachers in the use of ICTs it is important to be aware of some of the challenges that the teachers and location of some of colleges may have in the use of and accessing certain ICTs as Ajayi (2008:210) observes that the major problems of using ICT for teaching include poor electricity supply, inadequate ICT facilities and lecturers incompetence in the use of ICT facilities.

Recommendations

Capacity Building for ODFL delivery and development Systems
The Ministry needs to put in place a workable and regular capacity building programme that will ensure that managers and facilitators involved in ODFL programmes put in place appropriate systems before starting ODFL programmes. For those that are offering ODFL programmes, there is need to ensure that these systems are being improved and that all the aspects of the ODFL delivery and development systems are always undergoing review.

Capacity Building in ODFL implementation of promising and best practices in use of ICTs in teaching
The Ministry needs to build capacity in institutions to document and share promising and best practices in ODFL implementation in the use of ICTs in teaching. This should be among all the TVET colleges involved in providing ODFL programmes. However, the Ministry can also share promising and best practices from higher educational institutions and from institutions outside Zambia.

Addressing challenges in ODFL implementation
Training institutions need to be encouraged to look for local solutions in addressing some of the challenges that they face. The Ministry and TEVETA needs also to constantly engage the institutions so as to come up with workable measures to address some of the challenges that they face in ODFL implementation. There is also need to use technologies already owned and used by students (Ng’ambi, 2012).

Conclusion
The paper sought to develop a framework for capacity building in the use of educational technologies in Open, Distance and Flexible Learning Zambian Vocational Colleges by teaching staff to guide Colleges seeking to offer effective ODFL programmes. Findings of the study were on systems put in place for ODFL delivery and development, institutional ODFL policies available, monitoring and evaluation of ODFL policies, alignment of ODFL policies to strategic plans, numbers of managers trained in ODFL management, development of staff in ODFL delivery, governance structures for ODFL programme and delivery and promising and best practices in ODFL implementation. The study recommends putting in place a workable and regular capacity building programme that will ensure that managers and facilitators involved in ODFL programmes put in place appropriate systems before starting ODFL programmes and building capacity in institutions to document and share promising and best practices in ODFL implementation in the use of ICTs in teaching.
References


