Uptake and Mutual Recognition of MOOCS in South Africa

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The book is based on the research conducted and the subsequent report written by researchers for the NEMISA K4I Unit. Since the report was commissioned by NEMISA, we would like to thank them for funding and the School of Computing at UNISA for facilitating the research through their facilities at their Science Campus.

Researchers

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Expert Participants in the Workshops

We are grateful to the following experts from community engagement projects, non-governmental organisations, Government departments, institutions and research units at universities who are engaged in the development and presentation of MOOCs and other on-line courses. This large group gave up their time and covered their own expenses in order to attend the workshops. They contributed their knowledge freely and participated enthusiastically.

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Foreword from the NEMISA Chief Executive Officer

Skills development in a digital world is changing, much more so in the Fourth Industrial Revolution (4IR) which is seeing more and more physical devices interconnected through the internet. This book, *Uptake and Mutual Recognition of MOOCs in South Africa*, was triggered by a research question raised by the Department of Telecommunications and Postal Services in May 2019 to NEMISA about practical solutions that could guide policy decisions on the successful implementation, support and massification of MOOCs in South Africa.

To offer a balance and evidence-based response, NEMISA conducted an in-depth empirical investigation into the phenomenon through the K4I Unit located at UNISA. The research covered a broad range of existing and potential MOOC users from all social and economic categories in all nine provinces of South Africa, online education trainers, community leaders and business leaders.

The findings revealed the great extent to which multifaceted change and flexibility is needed at institutional and individual levels if MOOCs are to be adopted successfully and cross-accredited across higher education institutions (HEIs). In as much as MOOCs are easily accessible, there remain challenges in individual access in rural and township areas, individual perceptions, and management resistance to adopt new ways of accessing and offering online content. Among many interventions are awareness of the available MOOCs and how accredited MOOCs can be designed with skills pathways into jobs – that is the critical issue. NEMISA is working with the outcomes of the findings to improve its 4IR course offerings along with a number of stakeholders in industry, academia and international agencies.

We thank the UNISA team for leading the efforts in compiling the book, the experts who offered a great deal of insight based on their experiences, and the 3 000+ individuals from all works of life in South Africa for making time for us and participating in the investigation in whatever form.

Trevor Rammitlwa
Chief Executive Officer, NEMISA

Chapter 1: Massive Open Online Courses

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1.1   Background

The original funder of the research project, the National Electronic Media Institute of South Africa (NEMISA), was interested in finding educational options that communities, unemployed youth, and those needing to update their existing knowledge, skills and qualifications could take advantage of. The International Monetary Fund (IMF 2020) confirms that South Africa's unemployment rate is significantly higher than in other emerging markets, with youth unemployment exceeding 50%. The envisaged opportunities could prepare the beneficiaries for new careers, possibly help them to find work for the first time, or be promoted, or change direction in their careers. NEMISA referred to the project as contributing to the "massification of education". One of the options is to encourage South African citizens to consider taking Massive Open Online Courses (MOOCs)[1] in order to improve their employability both immediately and in the long term.

The primary purpose of this book, *Uptake and Mutual Recognition of MOOCs in South Africa*, is investigating and explaining what additional structures and support are needed so that MOOCs can be used successfully by people living in South Africa in order for them to obtain knowledge, skills and qualifications. A participant in one of the workshops which will form part of the discussion in the book explained the purpose of a MOOC as follows, "So, what we are really trying to do is this – to respond quickly to industry demands by means of short targeted learning interventions that address a very particular skills issue."

Encouraging the uptake of MOOCs requires a thorough understanding of the circumstances under which MOOCs have value to employers, potential and currently employed persons, professional bodies, and other authorities. Mutual recognition of MOOCs entails the recognition of their value by other higher education institutions (HEIs).

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[1] Not all courses that are offered online are strictly speaking either "massive" or genuinely "open". Hence, it is more correct to indicate the variation in courses by using the term MOOC-like. Many of these are simply on-line courses. However, from now on we will refer to MOOC where we mean a course that is offered entirely online and is fairly easily accessible (pre-requisite knowledge requirements and costs are reasonably low). Definitions of MOOC are provided in Section 1.6.

However, the full spectrum of questions about acquiring skills and jobs cannot be addressed in the book. The scope, discussed in Section 1.3, is limited to a needs analysis and conceptual view of a national MOOC ecosystem, that is, the additional support services that are required to make the uptake of such online courses an attractive option. The specifics of either creating or implementing the proposed South African (SA) MOOC ecosystem are not presented.

1.2   Intended Readership

The book reflects the perceptions and opinions of a representative sample of South African citizens regarding the value they see in online learning, and insights gained from experts with diverse and wide-reaching experience of the needs of communities and in the design and development of MOOCs. Several experts had first-hand experience regarding retention of MOOC students[2] and they explained why many students do not complete MOOCs and what might be done to reduce this drop-out rate. Hence, the book will be of interest to three groups of readers.

Firstly, the recommendations summed up in Chapter 8 will be of interest to managers in the general field of education and training and those who see a role in developing educational policy. These include school principals, heads of departments, deans, deputy vice chancellors at universities as well as principals of colleges. It should make them aware of the need to develop and adopt policies that indicate the degree of recognition their institutions give to MOOCs developed outside their institutions; the types of support they provide to students at their institutions who are taking online courses; and the support they give to teaching staff who create and present such courses.

Secondly, the book will also be of interest to academic researchers contributing to this field as it reports in detail and in an academic manner on the research undertaken and the associated data collection processes, data analysis and findings.

Thirdly, the book will have value for people involved in education and training who see a role for MOOCs or MOOC-like courses, including those already creating such courses or platforms and those exploring the possibility of developing or using such courses in a South African context. This group of readers will be encouraged to look at the development from a broad perspective in which there are opportunities for multiple groups of service providers.

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[2] We will refer to those registered for MOOCs as students rather than as learners as in most cases MOOC content does not cover part of a primary or secondary school curriculum. Most people registering for MOOCs are expected to be adults. In South Africa "learners" refers to children at primary or secondary school (K-12).

1.3 Scope

Although the book looks specifically at the uptake and mutual recognition of MOOCs in the context of South Africa – and it considers context to be immensely important – the authors believe that the discussion will be of value to the three groups of readers described above who are located elsewhere in Africa and the world. It will raise research questions; highlight matters of policy intended to encourage the development, recognition and effective use of MOOCs and MOOC-like courses; and, hopefully, will boost skills development with associated employment opportunities for those who need them.

The book contributes to the discourse concerning the uptake of MOOCs; the retention of students; and ways in which the MOOC ecosystem can be extended so that education and training goals can be achieved effectively and efficiently. The book investigates why the existing alternatives are insufficient and puts forward the outlines of an alternative MOOC learning model as recommendations. However, "solutions" are not offered, and a *detailed* specification of the proposed SA MOOC ecosystem is not presented. It is also acknowledged that not all the challenges of implementation have been foreseen. Therefore, there is ample scope for academic researchers and systems developers to contribute further to the debate in terms of theory and practical suggestions.

1.4 Research Problem

South Africa has a persistent problem of unemployment that has risen steadily since 2008; according to Statista,[3] in 2019 the unemployment rate reached 28.18%. Unemployment is acute amongst the youth (aged 15 to 24) with an unemployment rate of 55.2% recorded in the first quarter of 2019 and even graduates are unable to find employment – 31.0% of graduates 24 years old or younger were unemployed in the same period. Unemployment is recognised as have far reaching consequences besides the obvious financial hardship it causes, and the situation has become even worse in 2020, largely due to the Coronavirus pandemic. The South African economy shed 2.2 million jobs in the second quarter of 2020, according to the latest Quarterly Labour Force Survey Quarter 2: 2020 results, released by Statistics South Africa on 29 September 2020.[4] Of these, 648 000 were jobs in the formal non-agricultural sector.[5]

There is a worldwide prediction that many jobs will be automated over the next five years (this is known as the Fourth Industrial Revolution abbreviated to 4IR), and hence, that a large percentage of the current workforce will need to obtain either more advanced

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[3] https://www.statista.com/statistics/370516/unemployment-rate-in-south-africa; Accessed October 10, 2020.

[4] http://www.statssa.gov.za/?p=13633#:~:text=The%20significant%20changes%20in%20the,recorded%20since%20quarter%203%3A2009; Accessed October 10, 2020.

[5] http://www.statssa.gov.za/?page_id=737&id=1; Accessed October 10, 2020.

skills or entirely new skills to prepare them for the new job requirements of the marketplace. The South African Government is actively seeking ways of addressing the problem and is looking for ways to "massify education" particularly amongst adults and young people who have left school or tertiary education without the qualifications and skills that are required by employers.

The current research project adopts the view that MOOCs are either available or can be developed to provide South Africans with skills that are in short supply, and hence, prepare the citizens of South Africa for the workplace and assist them to adapt to future skills requirements. However, there is a concern that too few potential MOOC students are enrolling for these courses; that the completion rate and mastery of skills is poor; and that even when someone has successfully completed a MOOC, the qualification may not be recognised.

1.4.1   Research Question

The over-arching research question was: How can the uptake of MOOCs in South Africa be increased, and how can MOOC qualifications receive mutual recognition at other HEIs?

1.4.2   Themes

Four themes were associated with the main research question and were used in the workshops and the survey, namely:

1. Motivation to register for a MOOC

2. Motivation to complete a MOOC

3. Accreditation

4. Government's role

1.5   Research Process

The research project that was the stimulus for the book was divided into two complementary parts (i.e. two workshops and a survey) which were planned as part of a single process but were carried out one after the other. Hence, the research methodology is best described as mixed methods research, since quantitative data and qualitative data were collected and analysed separately, but the two sets of findings were then compared and used to complement one another (Saunders, Lewis and Thornhill 2016, 170–171). Despite the fact that the collection processes occurred one after the other, the authors do not describe the current research as sequential mixed methods research because the outcome of the first phase was not obtained before the design of the survey questionnaire, and hence, did not inform it. Instead the authors describe the current research as concurrent mixed methods research another (Saunders, Lewis and Thornhill 2016, 170–171). This methodology is similar to that used for other

comprehensive research projects on the use of MOOCs (e.g. Dale and Singer 2019; Garrido, Koepke and Anderson 2016).

The first part of the research involved inviting experts from several South African organisations representing the public and private sectors as well as civil society and non-governmental organisations (NGOs) to attend two workshops. The purpose of the workshops was to hold detailed and informed discussions on the themes selected. Hence, part one of the research focussed mostly on the views of institutions and organisations that resemble those which may be asked to collaborate with the Department of Communications and Digital Technologies (DCDT) of South Africa in developing policy and implementing it. The first workshop had a community focus and the second had a business focus. The information obtained from the workshops was credible because the participants were selected based on their interest in the topic, their knowledge and their experience working in related fields. The quotations in the book reflect what the speakers believe to be true, but in the open discussions the validity of those opinions might have been challenged, and hence, contrasting or complementary views are presented here. The authors selected the quotations and one of the constraints was to limit the number of quotations.

Details of the way in which people were selected for invitation to attend the workshops and all the processes that were followed are described in Chapter 2.

The second part of the research collected data from the general public using a questionnaire. Part two of the research focused mostly on the views of MOOC students; hence, it was participant focussed (Liyanagunawardena, Adams and Williams 2013) and the survey is described in detail in Section 2.8.

1.6 Characteristics of MOOCs and MOOC Platforms

This section introduces the characteristics of MOOCs and MOOC platforms because it is important to understand what MOOCs are. The following characteristics of MOOCs and MOOC platforms are important but, as will be seen, there are several variations in this regard.

1.6.1 Massive

MOOC platforms[6] are expected to have extremely large numbers of registered students. According to the web site www.class-central.com (accessed in January 2020), Coursera has approximately 37 million students registered for at least one of its 3 100 courses, and edX has 18 million students registered for its 2 200 courses. However, these students predominantly come from high income countries – from 2012 to 2013, 80% of MOOC

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[6] MOOC platforms, such as Coursera and edX, are MOOC providers or online MOOC publishers which have many courses available. Some focus on subject groups, while others are sponsored by Government, NGOs, or a particular university.

students came from countries rated with a high or very high United Nations Human Development Index and that percentage increased from 2015 to 2016 (Czerniewicz et al. 2017a; 2017b; Nesterko et al. 2013; Reich and Ruipérez-Valiente 2019). Hence, MOOCs can potentially reinforce unequal access to education (Adam 2019; Rohs and Ganz 2015).

Courses hosted in African countries have far smaller numbers of students enrolled than those by the largest MOOC platforms (Adam 2019). Total enrolments for two of the most popular MOOC offerings from South Africa were 13 744 and 22 154, respectively, during the period 2015 to 2016 (Czerniewicz et al. 2017a). However, in contrast with MOOCs hosted elsewhere, they had a relatively high proportion of registrations from students in Africa (Czerniewicz et al. 2017a).

1.6.2 Open

This characteristic can be misunderstood (Kopp, Gröblinger and Zimmermann 2017), as in terms of an open educational resource (OER), "open" means that no copyright is claimed for the content (Czerniewicz et al. 2017b; Kopp, Gröblinger and Zimmermann 2017). Therefore, OER content can be used by teachers for courses and students who are not registered for the MOOC – it may be adapted, used only in part, or be supplemented with other material. As a result, teachers may adopt the material readily as they feel the adapted or extended course material fits their students' needs more completely than the original course.

Most MOOCs do not have content that can be described as truly OER (Blackmon and Major 2017). Supporting textbooks and other materials are not always published as OER (Boga and McGreal 2014). Hence, there are only a relatively small number of courses whose content can be used in any way by anyone at no cost; the rest permit only registered users of the MOOC to use the content. Despite this, it usually costs nothing to register for MOOCs (Boga and McGreal 2014). However, certain MOOC platforms (e.g. Coursera) make their content available under strict copyright terms and customising the content for local contexts is impossible (Boga and McGreal 2014).

The term "open" more usually means that there are no entrance requirements; there are no admission barriers in terms of prior qualifications or knowledge; and the MOOC can be accessed at any time from any place (Blackmon and Major 2017; Kopp, Gröblinger and Zimmermann 2017); hence, the MOOCs are inclusive.

1.6.3 Online

The term "online" means that the courses are delivered remotely via the internet.

1.6.4 Courses

There are a wide variety of courses on many different topics that are intended for students with diverse educational, geographic and cultural backgrounds. The courses

usually focus on post-secondary education (UNESCO 2016), although there are, for example, introductory courses for language teaching.

1.6.5   Other Attributes of MOOCs

MOOCs may have entirely flexible registration dates (i.e. students can register at any time). Some, but not all, have sessions with fixed starting dates but typically MOOCs are expected to be completed within 1 to 16 weeks (https://www.classcentral.com/help/moocs). Thus, a full university degree offered online would not be considered to be a MOOC as it extends over a longer period; generally requires evidence of completed education at secondary level; and usually is made up of several courses or modules.

However, one of the workshop participants suggested that it is

> a course as opposed to just-in-time learning of a particular skill for the just-in-time understanding of a particular concept. So, the authors see things like YouTube with just-in-time you will find that you will do just about anything. That in itself, by its nature, is not a course.

He continued, "A course implies that there are defined outcomes or predefined outcomes which means there needs to be some form of assessment." However, there was no agreement on this second point regarding assessment.

1.6.6   MOOC Platforms

MOOC platforms are MOOC providers or online "publishers" which have many courses available and provide some support services, such as maintaining a web site, registration processes and delivering course material. Some MOOC platforms focus on particular groups of subjects. Some are sponsored by Government, NGOs, or a particular university. The website https://www.classcentral.com/report/mooc-providers-list/ (accessed in October 2020) listed and gave information about the following MOOC platforms: Coursera (USA), edX (USA), FutureLearn (UK), SWAYAM (India), XuetangX (China), Udacity (USA), Kadenze (USA), Canvas Network (USA), Miríadax (Spain), MéxicoX (Mexico), France Université Numérique (Frnce), EduOpen (Italy), ThaiMOOC (Thailand), Federica.eu (Italy), NPTEL (India), Complexity Explorer (USA), Campus-Il (Israel), Open Education (Russia), Fisdom (Japan), Open Education (Taiwan), K-MOOC (Korea), and IndonesiaX (Indonesia). Although this list is long it is incomplete. As can be seen no MOOC platform was listed from South Africa although the University of Cape Town does offer some MOOCs.

1.7   Overview of Chapters

Chapter 2: MOOC Research Processes gives a detailed description of the research processes used in the research that provided the evidence on which the new contribution offered by the book is based. Four themes were associated with the research question

and these were used in the workshops and the survey. The themes are explored in four later chapters.

Chapter 3: Personal Characteristics of MOOC Students is devoted to an analysis of the data from the first two sections of the questionnaire. This serves to describe the potential MOOC students in South Africa and sheds some light on the social and economic circumstances under which they live.

Chapter 4: Motivation to Register for a MOOC explores the first theme. The chapter starts by discussing what the literature says about this topic and then presents the findings from the workshops and the survey that explored this aspect of the research.

Chapter 5: Motivation to Complete a MOOC has a similar structure but examines the difficulties faced by MOOC participants during their studies that might reduce their chances of completing the MOOC. Hence, the chapter explores the second theme quite broadly.

Chapter 6: Accreditation discusses the third theme and pays particular attention to one aspect of centralised regulation with associated services.

Chapter 7: Government's Contribution to the MOOC Ecosystem examines the fourth theme, that is, it looks specifically at ways to address the challenges raised in the discussions of first three themes. However, it has a particular focus as it set out to see if a centralised authority with an associated centralised support structure could make a meaningful contribution in this regard. This theme was stated earlier as "Government's role".

Chapter 8: The MOOC Ecosystem presents the proposed framework and final recommendations based on the findings from the survey as well as those from the workshops.

1.8   Conclusion

This chapter has outlined the background, intended readership, scope, research problem and associated research questions. It has introduced the reader to the characteristics of MOOC courses and MOOC platforms, and provided an overview of the chapters. Chapter 2 is devoted to the methodology used for research into MOOCs focussing on the contract research undertaken by the authors prior to writing the book.

Chapter 2: MOOC Research Processes

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2.1   Introduction

Chapters 3 to 7 present the findings from the data collected from the two different groups of respondents. However, first the authors need to explain the research processes used for the two distinct parts of the research, namely, the workshops and the survey, and the reasons for those choices. This chapter starts with a discussion on research methodologies and methods used in MOOC research as described in some recent academic articles on the topic. This is not a formal, systematic literature review but serves to highlight popular approaches and some possible challenges and pitfalls. This is followed by a limited discussion of two well-established theories of education. This is done to identify the four dimensions of the MOOC Uptake Model (MUM) that the authors develop and use in parts of the current research. Building on the discussions on research methodology and the two theories of education, they expand on the MUM to develop a more detailed conceptual framework (see Section 2.5.1) which is used to explain the composition of the questionnaire used in the survey. This framework is of value in the analysis of the results from both the workshop data and the survey data. In sections 2.2.1 and 2.2.2, the data collection process and how the data was analysed for the workshops and a complementary section for the survey are described.

2.2   MOOC Research Methodologies

2.2.1   Options Regarding MOOC Research Methodologies

Table 2-1, Table 2-2 and Table 2-3 are intended to highlight fundamental differences between the methodologies that may be used in research on MOOCs. A full explanation of the differences is not included as academic researchers will be familiar with them and others may not want a course on research methodologies here. It is sufficient to say that data collected from interviews, from questionnaires and from data recorded by the HEI or MOOC platform reflect vastly different views of reality. These views are complementary, and a combination of methodologies may provide a holistic view, but the results may on occasion appear to contradict one another. This indicates that a single methodology cannot *fully* describe or explain a complex research problem. Hence, the mixed methods approach where more than one research methods is used could be

appropriate, but the interpretation of results needs to allow for the different kinds of findings that may result. For example, MOOC retention and MOOC completion can both be measured using either logged data from a student records system or the data collected from respondents in a questionnaire; however, the two methods often provide hugely different results.

Table 2-1: Positivist/Realist MOOC methodologies

Method	Surveys	Big data
Worldview	Commonly supposed to be objective	Objective
Data capture instrument	Questionnaires	Collected automatically (collected from student records, number of times a web page is accessed, etc.)
Data type	Largely quantitative	Largely quantitative
Analysis	Statistical analysis	Algorithmic; Data analytics

Surveys using questionnaires are commonly supposed to provide objective data, but the data obtained depends on individual respondent's perceptions and questionnaire compilers' choices of questions asked and wording. This means that the data collected is not factual or unbiased.

Table 2-2: Interpretivist MOOC methodologies

Method	Interviews	Focus group discussions
Worldview	Subjective	Inter-subjective (socially constructed)
Data capture instrument	Audio recordings and transcripts	Audio recordings and transcripts
Data type	Qualitative data	Qualitative data
Analysis	Thematic	Thematic

Table 2-3: Mixed methods used in MOOC research

Scenarios using two or more of the methods from Table 2-1 and Table 2-2	GDSS workshops	Task completion workshops and usability lab sessions carried out individually
Worldview	Pragmatic (focussing on useful results)	Pragmatic (focussing on useful results)
Data capture instrument	Observations (research notes), GDSS (technology assisted)	Observations (research notes), some key press logging or timing of task completion and counting of errors
Data type	Qualitative data	Qualitative and quantitative data
Analysis	Thematic	Mixed

Data capture sequence	Sequential	Concurrent
Analysis sequence	Sequential	Concurrent

In a group decision support software (GDSS) workshop the participants collaborate as a group; are supported by GDSS; and reason about a decision to be made. Hence, the authors suggest that this type of workshop is different from a workshop where teaching and learning is the primary goal or a workshop where individual participants carry out a practical task. The proposal made here is that a collaborative workshop has a task-oriented goal and a pragmatic worldview which fits with a mixed methods research design.

2.2.2 Overview of Research Methodologies Used in MOOC Research

As noted above, no one methodology is better than any other. However, each one has major advantages.

Automated systems (see Table 2-1), which collect and record data about the number of times visitors access a web page or a particular link, use data analytics or algorithms to get more interesting results. These results can allow MOOC platform developers, administrators and even MOOC content creators to get quick feedback on the interest their sites are generating amongst potential MOOC students. Such statistics are used on sites, such as https://www.classcentral.com, to advertise the most popular MOOCs in terms of their registration. More detailed analysis of student records together with student activity can identify the location of students (Nesterko et al. 2013), which can subsequently be used to understand difficulties that students in certain places may be experiencing and they can also quickly alert the MOOC platform of unusually high dropout rates from particular places.

Surveys (see Table 2-1), on the one hand, can reach large numbers of potential MOOC users who are not currently registered and ask pertinent questions that cannot be answered by the big data from learning management systems or MOOC platforms' own student records. However, as this is self-reported data, it depends on the students' perceptions at the time of the survey as well as possibly unreliable memories of what they were feeling at some earlier time.

On the other hand, interviews (see Table 2-2) and group discussions (see Table 2-3) provide data that may not be very well structured, and the statements made might be ambiguous or else may not be carefully considered, and hence, may be misinterpreted. However, compared with surveys and data logged automatically, qualitative data is very often richer and more laden with meaning than the highly structured and very concise data from the surveys and logs.

A final source of collecting data is by means of observation, such as in a usability lab or a field study (see Table 2-3 – Column 3: Task completion workshops and Usability

lab sessions carried out individually) where trained observers make research notes while watching students work as they normally do when learning via a MOOC. These observations depend heavily on the researchers' skills and can be time consuming, just as is the case with interviews.

In conclusion, ideally, MOOC data needs to be collected and analysed regularly, using all the different research instruments and techniques.

2.3   Literature Informing the Survey

A literature review was carried out of recent academic articles (for the period 2014–2019) with a particular attempt to find articles relating to the use of MOOCs in Africa and developing countries. The table in Addendum A was compiled of all the literature found in which key concepts were identified and the research methodology used was noted. As this table is of academic interest rather than of use for policy recommendations it has been placed in a separate addendum. Key concepts from some of these articles were used in setting up the questionnaire.

Only one of the articles reviewed included the questionnaire used. This was the report by Maria Garrido and Lucas Koepke both from the Technology and Social Change Group (TASCHA), University of Washington Information School, in Seattle, WA, and Scott Andersen, of IREX, Washington, DC, with contributions from authors in Colombia, the Philippines and South Africa (Garrido, Koepke and Anderson 2016).

Garrido, Koepke and Anderson (2016) used mixed methods as the authors have done. They acknowledge that some of the questions in their questionnaire come from a working paper by Christensen et al. (2014). The table in Addendum C references articles that discuss the concepts shown in Figure 2-1, and indicates the questions related to those concepts. Five of the research studies used a positivist approach (Dhorne et al. 2017; Jiang et al. 2014; Moneta 2004; Tariq, Mubeen and Mahmood 2011; Tracey, Swart and Murphy 2018), but none of them published the questionnaire used.

2.4   Selected Theories of Education

As background the authors move away from research methodologies and briefly outline two educational theories that are useful but were not developed with educational technology as a focal point. However, they can contribute insights into aspects of research into MOOCs. Bandura's (1989) Theory of Reciprocal Causation together with Bandura's Social Cognitive Theory gives a comprehensive overview of the interacting elements influencing human cognition and resulting behaviour in the context of social learning. Social Constructivist Theory looks at the *process* of building and sharing knowledge (Shaikh, Karim and Asif 2017; Vygotsky 1978). The theories complement one another to some extent. The discussions on these theories are intended to highlight well-established concepts which are used later in this chapter in developing a conceptual model for MOOC research (see Section 2.5). This model is evident in the

composition of the questionnaire used in the empirical research discussed in the book. It is also used in the analysis of the data from the workshops and the survey.

2.4.1 Social Cognitive Theory

Bandura (1989) emphasises the bi-directional interactions between three elements, namely, person, environment and behaviour (see Figure 2-1). This principle is termed triadic reciprocality. The personal factors include cognitive ability, affective and physical attributes. The environment is shaped by economic and social circumstances. According to Social Cognitive Theory, behaviour is influenced by both personal factors and the environment, but people are not just mechanical responders to deterministic forces. A basic assumption in Social Cognitive Theory is that people can regulate their thoughts, emotions, motivation and actions, that is, people can control and direct their behaviour. Individuals reflect on their past behaviour; make choices regarding their future behaviour; and are aware of their environment.

An associated assumption is that learning is goal oriented. Hence, before adopting a new plan of action or behaviour related to learning, a person will try to assess the likelihood that this will lead to the desired goal (Alexander et al. 2011). And during an extended activity or after it is completed, the person will look at the outcomes and the extent to which they were satisfactory. This will influence his or her attitudes and opinions. The actions may impact on the environment and immediate social context. Individuals develop constantly and contexts are always changing.

Hence, a person's actions and assessment of the outcomes of those actions, will influence his or her attitudes and opinions and may also impact on the environment. Individuals develop constantly and contexts are always changing.

Bandura (1986, 391) defines self-efficacy as "people's judgments of their capabilities to organise and execute courses of action required to attain designated types of performances". He considers self-efficacy to be the mechanism that has the strongest influence on personal agency (Lent, Brown and Hackett 1994). Therefore, Social Cognitive Theory pays particular attention to personal agency and seems to say that, although the environment, including social context, will play a role in shaping the individual learning process, the individual ultimately drives his or her own learning process even if this is not done consciously.

Social Cognitive Theory identifies the main (high-level) interacting elements influencing human cognition in the context of social learning. These are the *social origins of* cognitive processes.

Social Cognitive Career Theory was developed from Bandura's general Social Cognitive Theory (Lent, Brown and Hackett 1994). This is relevant in the discussion on MOOCs in the book as the research project originally intended to address employability. As can be seen in Figure 2-1, interest, self-efficacy, outcome expectations and goals are

inter-related via various paths in the SCCT model, with interest playing an important intermediate role (Alexander et al. 2011). Interest has proven to be the major, direct influence in goal setting, although both self-efficacy and outcomes contribute directly to goals to some extent (Zhang 2007). Self-efficacy has an impact on one's choice of career because it not only contributes directly to goal formation, but to a greater extent it contributes to the development of interest (Alexander et al. 2011). Self-efficacy affects outcome expectation, as belief in one's ability to achieve in a particular field makes one more hopeful of benefiting in a meaningful way from the positive outcomes one associates with the career. Outcome expectations also contribute to development of interest and, to a limited extent, directly to goal formation.
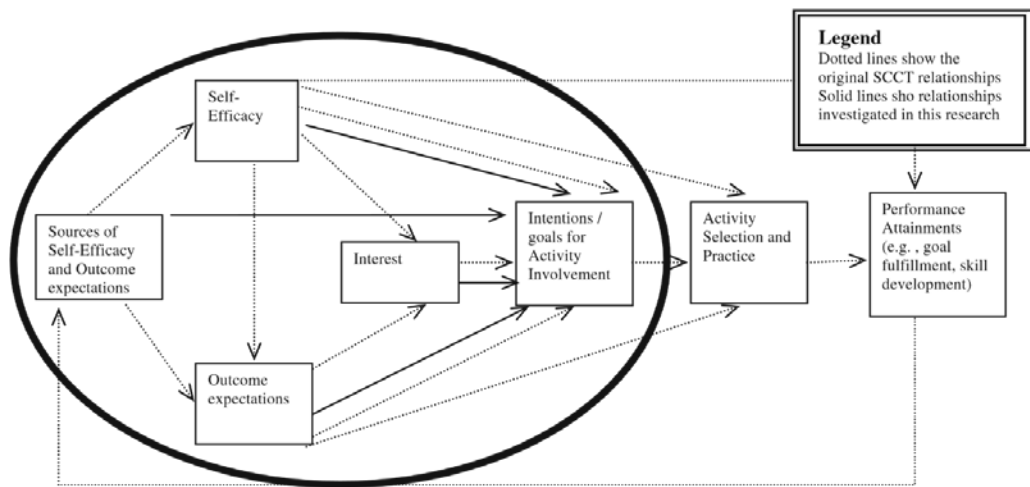
Figure 2-1: Model of how basic career interests develop over time with the current research focus identified

Source: Adapted from Lent, Brown and Hackett 1994, with authors' permission

2.4.2 Social Constructivist Theory

As a complementary view, Social Constructivist Theory states that knowledge is co-constructed with others (Vygotsky 1978). This view sees learning as requiring active participation in the learning process of groups of students and teachers in a shared environment. Collaboration, discussion, group work, feedback and interaction all are part of the process.

2.5 The Conceptual Model

2.5.1 Dimensions Underlying the Conceptual Model
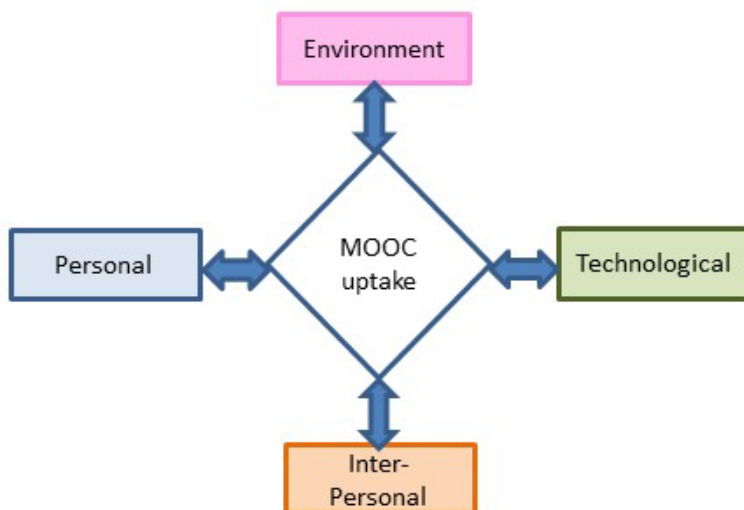
Figure 2-2: The dimensions underlying the MUM

As a first phase to building the MUM, four dimensions are identified, each of which has an associated worldview.

The Personal and Environmental dimensions are adopted from Social Cognitive Theory and Environment is also acknowledged in Social Constructivist Theory. However, the MUM expands on the principle of triadic reciprocality found in Social Cognitive Theory by adding two more dimensions. Vygotsky's (1978) Social Constructivist Theory of Learning is acknowledged by including an Inter-personal dimension into which the learning (or knowledge construction) process belongs. The principle of task technology fit is widely recognised in studies of adoption of technology, as is perceived usefulness of the technology to achieve goals. This is added in the MUM as the Technology dimension because the MOOC platform is a technology rich one.

Each of the dimensions (or elements) of the MUM influence the uptake of MOOC as a learning (and learned) behaviour but, as emphasised by Social Cognitive Theory, the uptake of MOOCs will impact on the student and result in changes in the environment, in the evolution of MOOC-related technologies and possibly on the teaching and learning process.

The data collected for concepts related to the Personal dimension are seen to be primarily subjective, data collected for the functionality and access to technology (Technology dimension) is primarily objective, and data for the inter-personal aspects (MOOC students, teachers, developers and administrators are a limited size group of

people with common purpose; interactive and jointly constructed knowledge) are inter-subjective. In the case of the environment and social context data reflects a socially constructed worldview. The dimensions are therefore aligned with different worldviews (see Table 2-1 and Table 2-2).

A pragmatic approach (see Table 2-3) allows the different worldviews to be addressed within a single research project using mixed methods. Therefore, this was the approach used in the research reported on in the book.

2.5.2 Application of the MUM for Use in the Questionnaire

The dimensions of the model are now explained by adding examples of concepts for each dimension and then linking these to the questionnaire that was developed. The selection of concepts was influenced by the literature referred to in Section 2.3. This application of the MUM is done in a series of diagrams that have explicit references to the questionnaire. The concepts are considered to be self explanatory but Addendum A and Addendum C add some detail.

In Figure 2-3, Figure 2-4 and Figure 2-5, the blue shaded rectangles represent individual (personal) factors; the purple-pink shaded rectangles represent factors that are part of the external environment; the orange-red shaded rectangles represent the teaching and learning process; and the green shaded rectangle is technology related.

Figure 2-4 repeats some of the information from Figure 2-3 in a graphical format and links the concepts identified to sections of the questionnaire. Figure 2-5 is a composite picture of Figure 2-3 and Figure 2-4. The application of the MUM will be explained in more detail in subsequent chapters.

It is important to note that in the research project there was no attempt to quantify the extent to which the concepts identified in Figure 2-3, Figure 2-4 and Figure 2-5 contribute to achieving the central concepts (Motivation to enrol for a MOOC and Motivation to complete a MOOC). Hence, hypotheses have not been formulated and a predictive model will not be proposed as an outcome of the research.
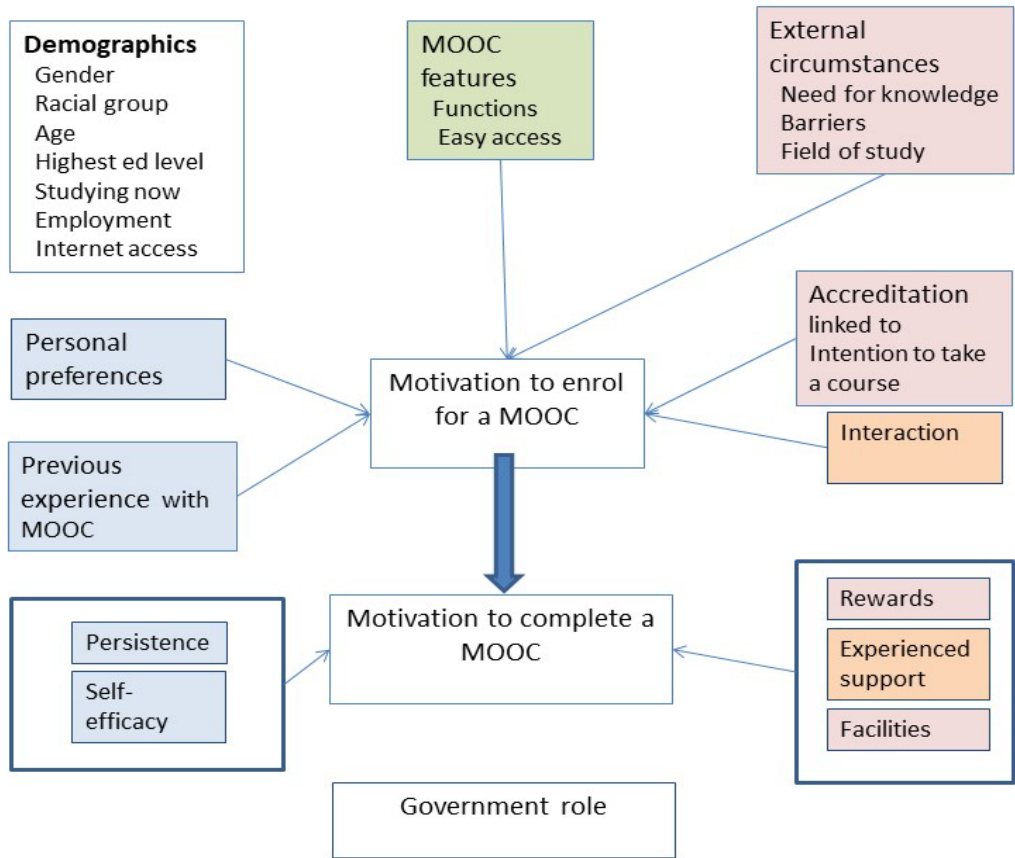
Figure 2-3: The MUM conceptual framework
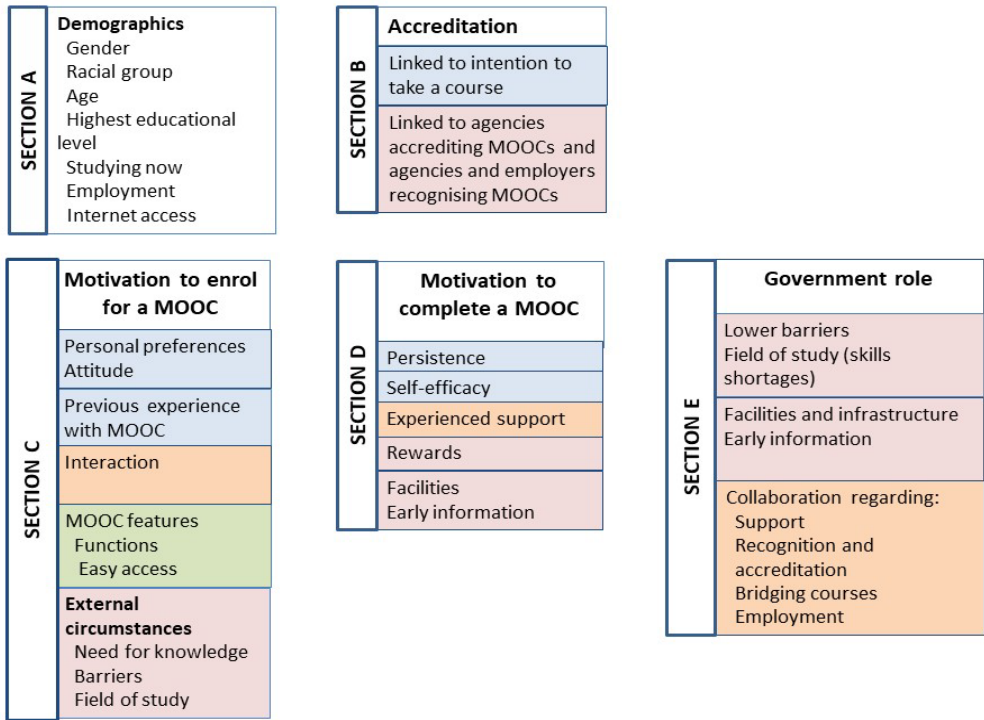
Figure 2-4: Concepts linked to sections of the questionnaire
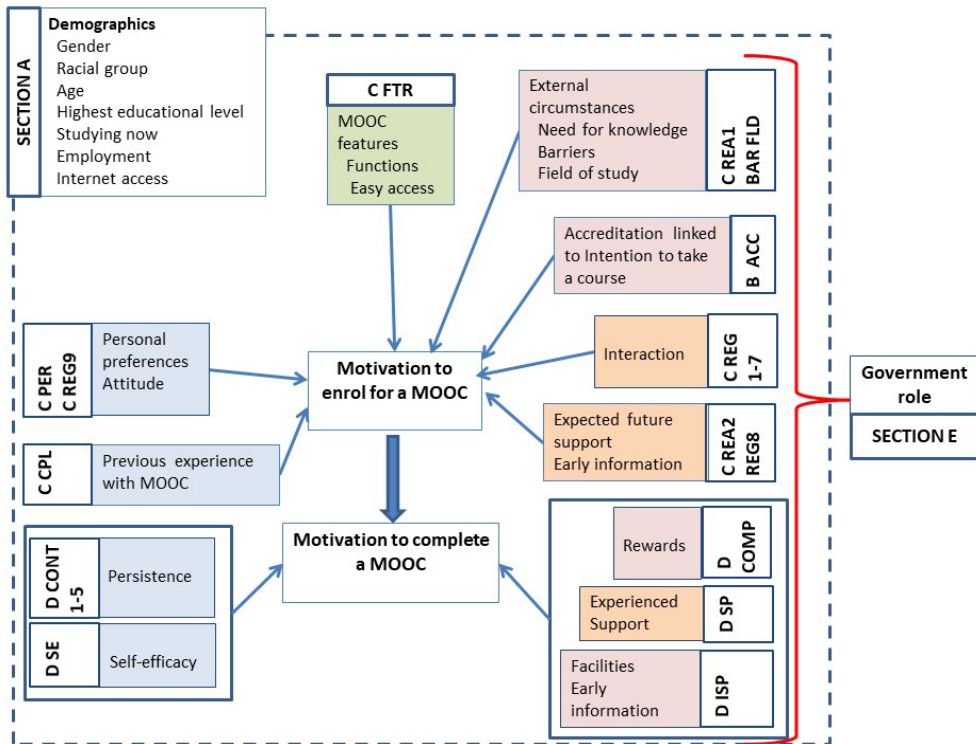
Figure 2-5: Possible relationships between the conceptual framework, sections of the questionnaire and the research questions

2.6 Research Strategy Selected

The presentation of the workshops resulted from the recognition that qualitative data should be collected from people with a good understanding of the educational needs of unemployed people seeking entry-level qualifications and the need for IT professionals to remain abreast of skills in an evolving discipline. However, it was as important also to obtain input directly from the citizens of South Africa via a survey. Therefore, as noted in Chapter 1, the research carried out involved concurrent mixed methods although the data collection processes occurred in sequence.

The data from the workshops was obtained before the design of the survey questionnaire was completed but the analysis of the workshop data was done after that. The methodology used resembled that used for other comprehensive research projects on the use of MOOCs (e.g. Dale and Singer 2019; Garrido, Koepke and Anderson 2016). It is interesting that mixed methods MOOCs research has generally only been done when supported by a funding agency. In other words, academic researchers do not have the resources to carry out such research without access to funds from a sponsor.

2.6.1 Selection of Workshop Participants

The participants invited to the workshops were carefully selected so that information obtained reflected many points of view. There were 47 people on the list of invitees including people from:

- NEMISA CoLabs[7] (their directors or other staff members).

- Non-governmental organisations (NGOs) and community leaders engaged in programmes of various kinds to enhance business and digital skills particularly in disadvantaged communities.

- Educators who have first-hand experience of using or creating online courses (with an emphasis on MOOCs but not excluding those in distance education in general).

- Representatives from international organisations in the information and communication technology (ICT) sector who complement their sales and support of software products that are used extensively with online courses (MOOCs) and certification.

- Representatives from business organisations whose core business is not in the ICT sector but who have large ICT divisions whose staff need to be reskilled and upskilled regularly in order to keep abreast with advances in ICT so that the company can maintain competitive advantage.

Table 2-4 shows the final distributions. The authors do not refer to participants by name as they explained in the workshops that the data would be anonymous.

Table 2-4: Selection of workshop participants

Group	Invited	Attended 27 November	Attended 28 November
CoLab plus MOOC consultant, included TVET	11	2	2
Government (DCDT, DHET, NEMISA, NSA	8	3	1
NGO	5	4	1
Educator	10	4	2
ICT MOOC provider	5	0	1
Business	3	0	1
SAQA	1	0	0
SMME	4	1	0
TOTAL	47	14	8

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[7] www.nemisa.co.za

Note:

DHET = Department of Higher Education and Training

TVET = Technical and Vocational Education and Training

NSA = National Skills Authority

Some of these people and their organisations had well-established relationships with the digital skill initiatives of NEMISA, but others were sought out based on articles they had published, recommendations and reputation. None of the participants were directly aligned with any existing MOOC platform supplier although some had some experience using edX. All made meaningful input. Four invited people expressed great interest in the research but were unable to attend (the invitations were not sent out sufficiently far in advance). Two of them were from the business sector (not ICT software providers). A small number of people attended on both days (one was from education, one was a consultant on MOOCs, and one was the owner of this project from the Department of Telecommunications and Postal Services (DTPS). Three research team members also attended on both days (they were not counted in the totals above).

Although only 19 individuals accepted the invitations (22 minus the 3 who appear twice on the list as they attended on both days), the authors were happy with the turnout and the quality of data they obtained. The delegates all participated enthusiastically. Although some of the delegates from the NGOs and small, medium and micro enterprises (SMMEs) were initially uncertain that they had relevant experience and said that they were there to learn from the others and to absorb information, they contributed important insights about the needs of the communities in which they lived or worked.

In sections 2.7 and 2.8, the research design of the workshops and the survey will be described in greater detail.

2.7 Workshops

The GDSS workshops conducted to obtain data regarding the uptake and recognition of MOOCs in South Africa, lasted from 09:00 to 15:30 and took place on two successive days. The first considered the research questions from the point of view of individual participants from communities where there is high unemployment. The assumption was that this group of potential MOOC students are either self-motivated (intrinsic motivation) or are influenced by people other than current employers (extrinsic motivation). The second day focussed on the use of MOOCs to update or add to the knowledge or skills of employees. Here, the assumption was that current employment was likely to play a role in the decision to study further.

2.7.1   Research Questions

The research questions for part one of the research were restated as follows:

- What, *according to the panel of experts*, motivates individuals to register for a MOOC?

- What, *according to the panel of experts*, encourages individuals to complete a MOOC?

- *According to the panel of experts*, how can the South African Government policies assist in increasing the uptake of MOOCs?

- *According to the panel of experts*, how can mutual recognition of MOOCs be strengthened and extended?

2.7.2   Collection of the Workshop Data

In each of the workshops, qualitative data was collected in two ways; a GDSS package was used and there were also sessions devoted to open verbal discussion. These complementary data collection methods provided a rich set of data.

A venue, with Wi-Fi access to the internet and a data projector, was used to accommodate the technology-enabled part of the workshop and the participants used their own laptop computer (mobile devices can also be used to interact with the GDSS but a larger screen is preferable). The participants were invited to join the GDSS session via an emailed invitation where the password was provided. The GDSS package assists in capturing input from the invitees completely and easily for later analysis and synthesis.

A single facilitator guided a process that had been planned and structured ahead of the session and this made it easy to maintain focus and helped the session to remain on schedule without being overly rigid. The GDSS package is designed to encourage everyone to participate actively throughout – they all type in their contributions at the same time and during the next phase of the workshop these comments can be displayed both on the large screen at the front of the room and on individual laptops for further debate and discussion. The risk of a dominant person preventing others from speaking is minimised as everyone types at the same time. In the workshop sessions, a second round of typed input (commenting on earlier input) followed. Once the information had been collected, the facilitator organised the data by grouping similar views.

Since everyone was in the same room, there was an opportunity for normal (co-located) oral discussions and the benefits of face-to-face communication could be realised. In the MOOC workshops, both the typed text and audio recordings of the open verbal discussions were stored for analysis.

2.7.3   Analysis of the Workshop Data

The GDSS data was supplemented by audio recordings of the open verbal discussions which were transcribed, and all the data was available for qualitative analysis using Atlas.ti version 8. In this analysis, codes (a single word or brief phrase) were created by the researcher as needed and were linked to sections of the text (known as quotations). This coding process highlights concepts (these may be an object, process, benefit, challenge or any other matter that the researcher believed was important) by linking the quotations to the concept's code. A concept could appear in several places in the text (although these may have been stated differently). Hence, related sections of text, that is, text that explained a concept, expanded on it, developed it further, or contrasted with a previous view of that concept, could easily be retrieved. This process of creating and assigning codes to text required several passes through the complete text and codes continued to be added, merged, deleted and grouped into higher level code groups (families and hierarchies of codes). The process was, therefore, time consuming and required considerable thought.

Two members of the research team were expected to analyse the set of data from each workshop (i.e. the data collected automatically by the GDSS and the transcriptions of oral discussions). This improved the analysis, as coding of qualitative data is inevitably subjective and dependent on the analysts' different worldviews. Accounts of the participants' experience, values and interpretations of events and societal needs, and their proposals regarding why people were doing things and their recommendations were obtained. These included discussions about potential MOOC students adopting and completing MOOCs, and the role that Government can and possibly should play in encouraging the uptake of MOOCs and other stakeholders' views on mutual recognition of MOOCs. Since the interpretivist research paradigm was adopted in this part of the research, multiple interpretations were acceptable and neither the data collected nor its interpretation by the analysts is "true" or "false" or objective.

The coders were not initially provided with code sets as the authors did not want to prejudge the data in any way and interpretations by the coders (all of whom have PhD degrees and were understood to have done analysis of qualitative data quite recently) were expected to differ. However, this approach results in many codes, many of which are similar. In the case of the GDSS data, the proliferation and complexity of codes was addressed by one of the coders (Coder A) assisted by the project leader, creating *code groups* for the data after some of the coding was completed (hence, the number codes was reduced by grouping them and retaining only the group code). This set of code groups was then sent to the second coder (Coder B), who was asked to use a code group where there was a good fit but to add additional groups if necessary. The allocation of tasks was reversed for the GDSS data derived from the second day with Coder B creating the code groups and they were applied to the data by a second researcher.

Once the coding was completed, the lead researcher went through it carefully to eliminate any remaining redundant codes by merging similar codes and removing codes that had only one or two quotations. The transcribed data was handled in a similar way.

The results of the process were used to highlight concepts relating to the four themes and the Atlas.ti software was not used further to look at whether concepts appeared in adjacent pieces of text, that is, text that was found soon after each other. Hence, frequency of concepts was used, but a network of concepts was not fully developed. This will be evident in the analyses in subsequent chapters.

2.7.4   Findings from Atlas.ti Analysis of GDSS Data

There were two GDSS sessions (documents generated automatically by the GDSS system) and two transcription documents from the audio recordings taken on the two days.

Unsurprisingly, the code groups consisting of the largest number of individual (lower level) codes generally had the largest number of individual quotations identified in the documents. It is also important to note that it is possible for the same code to appear in more than one code group. Large numbers of associated quotations are an indication that a concept has come up repeatedly, and hence, that it is likely to be important (a key concept), but the authors did not attempt to rank the concepts.

The GDSS data was analysed as a single set of data although different participants attended the workshops on the two days. Even though the authors are not reporting who said what, the authors believe that these sessions encouraged all the participants to contribute albeit initially some participants doubted that they were "qualified to speak".

2.8   The Survey

2.8.1   Purpose and Structure

The second part of the research project was a large survey. The methodology used in the survey was participant focussed. In other words, it obtained its data from potential MOOC students carried out in all nine provinces of South Africa and using a quota sampling strategy. The quota sampling selected participants from provinces in numbers proportionate to their occurrence in the total population of South Africa and according to age groups. Data was collected from 3 147 respondents using a comprehensive questionnaire (see Addendum B). The questionnaire had nearly 100 questions which is acknowledged as being more than is desirable. The respondents were recruited and assisted by field workers who interacted with them personally. Care was taken to train the field workers so that the respondents were not influenced in terms of the answers they provided.

2.8.2 Research Questions

The research questions for part two of the research were restated as follows:

- What, *according to potential MOOC students*, would motivate them to register for a MOOC?

- What, *according to potential MOOC students*, would encourage them to complete a MOOC?

- *According to potential MOOC students*, how can the South African Government policies assist in increasing the uptake of MOOCs?

- *According to potential MOOC students*, how important is it that mutual recognition of MOOCs be strengthened and extended?

2.8.3 The Questionnaire

The five sections of the questionnaire reflect the research questions as follows:

- Section A: General information

- Section B: Accreditation (officially recognised)

- Section C: Motivation to enrol for (register for) MOOCs

- Section D: Motivation to complete the course

- Section E: Government's role

2.8.4 Sections of the Questionnaire

The full questionnaire is found in Addendum B. Figure 2-4 shows how the concepts in Figure 2-3 are located in the five sections of the questionnaire. As will be seen in the analysis, in a few cases questions in a particular group were subsequently assigned to a different group as they were considered to fit there more properly. These sections also match the research questions.

Seven screening questions were included in Section B of the questionnaire. These were used to eliminate respondents who either knew very little about MOOCs and the internet or who were not at all interested in taking courses of any sort. These questions were deliberately formulated to be easily understood and at a level that most people would find easy to answer (i.e. the barrier to participation was set low). Two further questions were intended to exclude people who were unlikely to take MOOCs in the future – the authors were keen to include people who were interested in the topic. The respondents were required to answer only three of the seven questions "correctly". Therefore, the field worker had to score this small set of answers. If the respondents got a lower score, they were considered to be unsuitable and they were asked to complete a short section

on an entirely different topic. This separate set is not discussed in this report. As it happened, less than 1% of potential respondents were excluded.

2.8.5   Questionnaire Refinement

The draft version of the questionnaire was reviewed and revised in a series of meetings between the researchers and the company which was contracted to train the field workers and then to collect the data. The data was collected by the field workers who were contracted to do the work and were trained and participated in the pilot of the questionnaire before the actual data was collected. The training session was attended by the field workers as well as some of the researchers and staff from the company. The data collection process used the most recent version of the questionnaire that was tested in the field as a pilot study conducted in three regions with a total of 100 questionnaires being completed.

- 51 Urban area: Johannesburg
- 22 Township: Soweto
- 27 Rural area: Alice and Bisho (Eastern Cape)

The report on the pilot study is given in Addendum D. The questionnaire was revised once more in light of the report on the pilot study. The final questionnaire is given in Addendum B.

2.8.6   Collection of the Survey Data

Procedure

The field workers actively recruited respondents who fitted the profile needed. Hence, this was not a random sample. The field workers approached potential respondents, recruited them, and then facilitated the completion of the questionnaire. Recruitment included explaining the purpose of the research project and issues regarding informed consent such as anonymity. A signed, informed consent form was collected from each respondent. Facilitation could include explaining a question or translating it but this was avoided as much as possible.

Process to Improve Data Validity

The field workers were monitored independently by the K4I team (see Addendum D).

After the demographic questions in Section A were answered, followed by three questions regarding the importance of accreditation, seven screening questions were asked to assess the respondents' suitability. This "suitability'" was intended to increase the validity of the findings, that is, "the extent to which the findings are really about what they profess to be about" (Saunders, Lewis and Thornhill 2016, 730).

An audit of the typing process was carried out. A random sample of 20% of the total data was audited to ensure that the typed data corresponded effectively with the physical questionnaires.

Limitations

The data collected for a survey using a questionnaire has strong points (a large number of responses can be collected over a relatively short period of time). However, it has weaknesses – facilitated data collection increases the cost of data collection and prolongs the period over which it takes place particularly when data is collected throughout the country and in rural and semi-urban and urban areas. However, facilitation increases the likelihood that questions are all answered and partially completed questionnaires do not have to be discarded.

Nevertheless, the use of a survey cannot give a completely factual report as there is no way of ensuring that respondents are not influenced by others, that they remember previous experiences correctly and are not over-accommodating. The data collected in a survey has a very different purpose from that collected in interviews of focus group discussions such as workshops. It also produces very different results from the data collected automatically such as from computerised student systems. Therefore, the results from the different components of the research project should not be seen in isolation.

The different research approaches complement one another, and hence, a mixed methods approach has significant advantages.

In the case of the survey the questionnaire was long despite several reviews where some questions were eliminated. This may have resulted in potential respondents declining to participate in the survey. However, the field workers did ensure that all questions were answered and no questionnaires were discarded once they reached the researcher carrying out the analysis.

2.8.7 Survey Sample

The company that was contracted to administer the questionnaires reported that, according to their desk research STATS SA report the following sample (see Table 2-5) should be collected.[8] This is quota sampling.

Table 2-5: Sample

Province	Sample size	Urban	Township	Rural

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[8] E-mail from Paul Issock, paul@osmozconsulting.co.za; December 2, 2019.

	total			
Eastern Cape	342	120	16	205
Free State	147	97	13	37
Gauteng	774	667	91	15
KwaZulu-Natal	576	248	34	294
Limpopo	306	57	8	242
Mpumalanga	234	93	13	129
Northern Cape	66	27	4	36
North West	207	155	21	31
Western Cape	348	291	40	17
Total	3 000	1 755	239	1 006

The eventual distributions are shown in the frequency analysis in Section 3.3.1. A total of 3 147 questionnaires were received.

2.8.8   Analysis of the Survey Data

Tools

SPSS 25 was used for data analysis.

Descriptive Statistics versus Inferential Statistics

The following sections explain the types of analysis carried out. They are included here as they apply to all of the themes discussed in chapters 4 to 7.

Once again, the authors emphasise that in the book there will be no attempt to quantify the extent to which the concepts identified in Figure 2-3, Figure 2-4 and Figure 2-5 contribute to achieving the central concept. This is because they did not include questions in the questionnaire to establish the extent of the respondents' intention to enrol for a MOOC and motivation to complete a MOOC. This decision was made based on the view that such data would be unreliable as the majority of the respondents were not expected to have had personal experience of MOOCs. Furthermore, the data collected that asked respondents whether they would enrol and would be motivated to complete without giving specific details of a MOOC platform and MOOC content was considered to be a poor choice. The authors believe that the data based on such broad and vague questions would have little value. As a result, a predictive model cannot be created at this time and only descriptive statistics are presented in this report. These do, however, include information about the association between categorical variables (they belong to the *r* family and are similar to correlations) (Morgan et al. 2019).

Reliability of Grouping of Items to Create Constructs

A Cronbach's Alpha value based on standardised items indicates the internal consistency of a group of items (questions) in a questionnaire (Saunders, Lewis and

Thornhill 2016). A value of 0.7 or above suggests that the questions in the group are measuring the same thing (Saunders, Lewis and Thornhill 2016). The values obtained for the groups of questions in each section of the questionnaire are shown in Table 2-6, Table 2-7 and Table 2-8. Question group (column 1) describes the concept that the group of questions investigate in relationship to motivation to enrol for (register for) a MOOC.

Table 2-6: Cronbach's Alpha values for questions in Section C: Motivation to enrol for (register for) MOOCs

Question group (Concepts)	Question codes	Number of items	Cronbach's Alpha value based on standardised items	Outcome
Features of MOOCS	FTR1 – FTR7	7	.789	Accepted
Accessibility of MOOCs	FTR8 – FTR12	5	.679	Considered to be sufficiently close to 0.7 to be accepted.
Real world conditions / External	REA1, REA2, REG8	3	.527	Not accepted

Table 2-7: Cronbach's Alpha values for questions in Section D: Motivation to complete the course

Question group (Concepts)	Question codes	Number of items	Cronbach's Alpha value based on standardised items	Outcome
Persistence	CONT1 – CONT5	5	.674	Considered to be sufficiently close to 0.7 to be accepted.
Motivators and rewards	COMP1 – COMP4 CONT7 and CONT8	6	.772	Accepted
MOOC self-efficacy	SE1 – SE5	5	.694	Accepted
Contingency / Prerequisite conditions	SP1 – SP5 and CONT6	6	.748	Accepted
Institutional support	ISP1 – ISP 6	6	.798	Accepted

Table 2-8: Cronbach's Alpha values for questions in Section E: Government's role

Question group	Question	Number	Cronbach's Alpha	Outcome

(Concepts)	codes	of items	value based on standardised items	
Government support	GSP1 – GSP8	8	.886	Accepted

From the results shown in Table 2-6, Table 2-7 and Table 2-8, only the 'Real world conditions/External' (REA) questions cannot be used as a combined group.

2.9   Conclusion

The GDSS sessions have been referred to as workshops, but as they were not task-based learning workshops, they could more accurately be referred to as focus group discussions. As noted in Table 2-2, a focus group research method is based on a strongly inter-subjective worldview, as meaning is shared and is often developed during a discussion (hence, it is built jointly as part of a process in which many people have the opportunity to participate). It is not subjective, as a subjective worldview indicates that opinions are personal and not easily changed. Nor is it objective, the discussion does not presuppose that there is a single, unchangeable view. It does not base all aspects of the discussion on evidence that is concrete and can be counted and measured. The resulting data is "rich'" as it is likely to be detailed, multifaceted and carefully explained. This data then must be interpreted by the researcher, so there are a series of interpretations that occur.

In contrast, the quantitative data was collected in a survey. The respondents simply gave their own answers, and hence, this is a subjective view, but it is over-simplistic to accept these answers as "facts" that will not change. The respondents are influenced by the questions included in the questionnaire and how they are worded; they are also influenced by the explanation given by the facilitator of the purpose of the questionnaire and possibly also how the facilitator translated or explained the individual question. Furthermore, the degree to which the respondents are personally interested in the questions; the length of the questionnaire; and the amount of time available will determine how much attention is given to a particular question. The respondents cannot be totally accurate as a limited number of options are provided and the option selected by the same individual may vary on different days for a variety of reasons. Thus, the data collected from a questionnaire is "thin" and the responses are analysed statistically, so an "average" response is obtained. It is this combined result that is generally considered to be generalisable and objective. There is little opportunity in a questionnaire that is made up of closed questions for the respondents to offer advice.

As is argued in Section 2.5, the MUM indicates that mixed methods be used.

Table 2-9: MOOC research methodologies

Method	Surveys	Big data	Interviews	Focus group discussions	Task-based learning workshops	Usability lab sessions
Worldview	Commonly supposed to be objective	Objective	Subjective	Inter-subjective	Mixed	Mixed
Paradigm	Positivist	Positivist	Interpretivist	Interpretivist	Mixed	Mixed
Data capture instrument	Questionnaires	Collected automatically	Qualitative data; Audio recordings and transcripts	Qualitative data; Audio recordings and transcripts	Qualitative data; Observations (research notes)	Qualitative and quantitative data; Observations (research notes)
Analysis	Statistical analysis	Algorithmic; Data analytics	Thematic	Thematic	Thematic	Mixed

The MUM proposed in this chapter reflects dimensions that align with the educational theories of Bandura and Vygotski. It includes the personal factors and environmental factors from Social Cognitive Theory, but it is extended to include the technology that is part of the MOOC platform. The MUM also highlights an aspect of personal cognition highlighted by Social Constructivist Theory (Vygotsky 1978). This is the interpersonal dimension of the model. Hence, this aspect is considering how well the proposed SA MOOC ecosystem will fit with the potential student's expectations in terms of co-constructing knowledge. Thus, the support structures included in the MOOC platform or eco-system, facilities enabling group discussions, group work, interaction with and assessment by lecturers are within this dimension.

The description of the research design, including the design of the questionnaire were given in this chapter as these were partly informed by strategies found in the literature on MOOC research. The concepts identified from the literature were used as part of the questionnaire design but had not been formalised before the workshops. Since the

researchers who were present at the workshops took care not to direct the conversations unduly, these concepts were not presented to the workshop participants.

Hence, the workshops and survey were designed to be independent of one another.

The three addenda referred to in this chapter appear at the end of the book:

- Addendum A: Literature Review Summary
- Addendum B: Questionnaire
- Addendum C: References Supporting the Questionnaire Design and Links to the Conceptual Framework

Chapter 3: Personal Characteristics of MOOC Students

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3.1   Introduction

This chapter looks only at the data collected from Section A of the questionnaire, which reports on what the authors refer to as the respondents' personal characteristics and is made up of: demographic data; data reporting on the respondents' education; and data regarding access to the internet. Hence, the chapter focuses predominantly on the personal dimension of the MUM (see Figure 2-2 and Figure 2-3), although personal environment (province in which you live) and employment are included.

3.2   Literature Review

3.2.1   MOOC Content Creation

Much of the MOOC content is created by university partners within the major MOOC platforms (Coursera, edX, FutureLearn, Udacity, etc.) (Liyanagunawardena, Williams and Adams 2014). However, individual institutions may independently offer training and certification on their products (e.g. Microsoft) or topics of particular interest to the organisation (e.g. human rights courses offered by Amnesty International). Universities in the Global South contexts produce only a small fraction of the OER and MOOC content.

Large MOOC platforms are increasingly resistant to including MOOC content from less well-known partners (this is particularly in the case of professional Master's degrees offered by the MOOC providers) as the reputation of the partners is important in the acceptance and recognition of the MOOC platform as a whole (Reich and Ruipérez-Valiente 2019). As a result, there is only a small contribution to MOOC production from the Global South (Adam 2019).

3.2.2   Content Customisation

There are strong arguments in favour of adapting existing MOOC content (Adam 2019). These are designed to fit the context of use and the particular needs of the students in terms of language used, examples that are familiar and terminology that is easy to understand (Adam 2019; Boga and McGreal 2014). Boga and McGreal (2014, 2) say, "Combining MOOCs with mobile phones could be a very powerful way to educate large

numbers of people in the developing world." However, this is only possible if the original content is an OER.

Several other authors also emphasise the importance of designing MOOC content that has cultural relevance for marginalised communities (e.g. Castillo and Wagner 2015; Launois et al. 2019). However, they acknowledge that there is an argument in favour of partnering with existing, for-profit companies and using globally recognised MOOC content with accompanying certification as a way to improve the employment prospects of students who have attained globally-relevant job skills. Boga and McGreal (2014) conclude with a strong statement advising against national MOOC policies that lock the country into one MOOC platform and which exclude participation by local partners and partners from different types of organisation.

3.2.3   Access

Access to the communications infrastructure and computing devices required for online learning at any level of education in South Africa should not be taken for granted or uncontroversial. Czerniewicz and Rother (2018) relate that students at a foremost South African university consider blended learning to be exclusionary as students on financial aid would not have the necessary access to the technology off campus. International studies confirm that developing countries are under-represented in the registrations for MOOC courses and there is greater participation in urban areas than in rural areas (Rohs and Ganz 2015). Rohs and Ganz (2015) believe that this is due to infrastructural issues, but this is an over-simplification (as pointed out by Prinsloo 2016). Social accessibility, within an explicit "equity agenda", is a more complex issue that is less easily addressed. The social barriers include infrastructure, but gendered social norms and even internalised beliefs that online learning is not achievable "for people like me", are major barriers as well. Czerniewicz and Rother (2018) propose an analytical framework which describes different types of inequity that have a negative impact on the student's successful use of online learning.

3.2.4   Other Challenges

Many authors consider that the provision of customised MOOCs, reflecting cultural context, language and expected prior learning, is important (Boga and McGreal 2014; Castillo and Wagner 2015; Colucci, Muñoz and Devaux 2017; Launois et al. 2019).

Launois et al. (2019) recommend cross-sectoral funding to make the development of such MOOCs possible. Boga and McGreal (2014) note the creation and use of customised MOOCs that fit the needs and context of students in Tanzania. Local development of this course content implies a further need for local accreditation and certification processes. These MOOCs may be based on existing OER material but developing customised course content is expensive and this highlights the difficult decisions that need to be made when deciding whether it is important to create content that is intended for a particular (often not very large) group of students.

Further decisions are required based on whether the MOOC is intended for formal or informal study and whether the MOOCs should fit into a structure (a learning pathway or MOOCs intended to support career progress) or be stand-alone (Colucci, Muñoz and Devaux 2017).

3.3 Analysis

3.3.1 Simple Frequency Analysis

Frequency analyses are presented to support the claim that the sample was representative of the general population of South Africa. The standard demographic categories (province, gender, racial group, age) (sections 3.4.1 to 3.4.4) and variables of particular relevance to this project (highest level of education, currently studying, employment status and most frequent internet access) are analysed using frequency (sections 3.4.5 to 3.4.8).

3.3.2 Descriptive Statistics

Descriptive statistics were obtained for questions where there were lists to choose from, such as barriers (see Section 3.5.2) encountered in the respondent's environment to studying through MOOCs and the field of study that a particular respondent is most interested in (see Section 7.3.2). These simple analyses identify areas where preparatory work is required to enable MOOC adoption and use (areas of infrastructure improvement and of MOOC content development).

3.3.3 Cross-Tabulations

Cross-tabulations were done to identify subgroups which would need particular attention when developing a policy for the promotion of MOOCs in South Africa. The IMF (2020) website statistics show that demographic variables need to be considered in a diverse population, where there are known to be extreme inequalities. South Africa's unemployment is significantly higher than in other emerging markets, with youth unemployment exceeding 50%. Two quotations from the IMF (2020) website confirm the inequality between South Africans:

> South Africa suffers among the highest levels of inequality in the world when measured by the commonly used Gini index. Inequality manifests itself through a skewed income distribution, unequal access to opportunities, and regional disparities. Low growth and rising unemployment have contributed to the persistence of inequality.

> Significant disparities remain across regions. Income per capita in Gauteng – the main economic province that comprises large cities like Johannesburg and Pretoria – is almost twice the levels as that found in the mostly rural provinces like Limpopo and Eastern Cape. Being close to the economic centres increases job and income prospects.

For example, it was considered necessary to identify which province, gender, racial and age groups had high unemployment levels or a large proportion of respondents who were currently studying.

3.4 Demographic (Independent Variables) Frequencies

Demographic (independent variables) frequencies were collected in Section A of the questionnaire and are reflected in Figure 3-1, Figure 3-2 and Figure 3-3. These were collected to verify that the sample was as required. The sample was acceptable in terms of geographic distribution, gender, and racial grouping. As requested, a high percentage of the sample were young as the client assumed that these are the citizens most in need of education and training opportunities.

3.4.1 Province

Table 3-1: Province frequency

Province	#	%
Gauteng	861	27.4
KwaZulu-Natal	575	18.3
Free State	160	5.1
Eastern Cape	364	11.6
Limpopo	306	9.7
Mpumalanga	227	7.2
North West	226	7.2
Northern Cape	63	2.0
Western Cape	365	11.6
Total	3 147	100.0
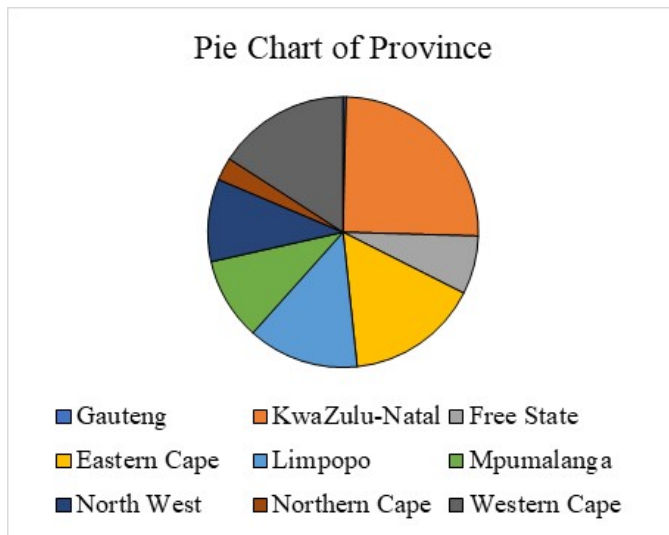
Figure 3-1: Pie chart count of province

The completed questionnaires were in proportion with the populations of the nine provinces.

3.4.2 Gender

Table 3-2: Gender frequency

Gender	#	%
Male	1 531	48.6
Female	1 608	51.1
Total	3 139	99.7

The percentages in terms of gender were representative of the total population.

3.4.3 Racial Group

Table 3-3: Racial group frequency

Racial group	#	%
Black	2 470	78.5
White	292	9.3
Coloured	201	6.4
Indian	158	5.0
Others	19	0.6
Total	3 140	99.8
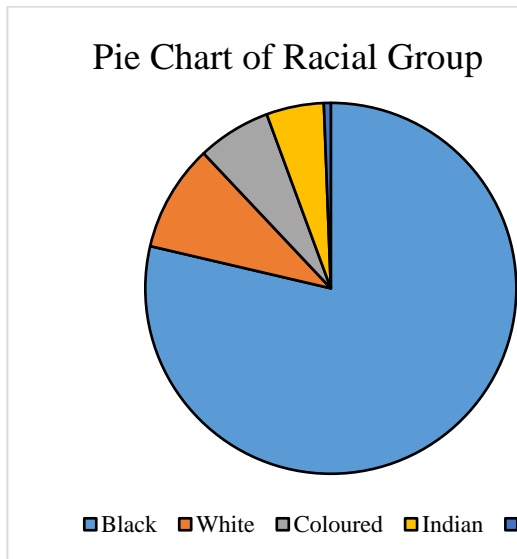
Figure 3-2: Pie chart count of racial group

The client for whom the research project was done asked for this category to be included in order to check whether any groups of the diverse and historically unequal South African were in need of additional assistance in order to make optimum use of MOOCs. The sample is distributed according to the population of South Africa.

Although the percentages for all groups other than "Black" are relatively small, the number in each group are sufficient for the statistics to be reliable.

3.4.4 Age

Table 3-4: Age frequency

Code	Age range	#	%
0	61 plus	1	0.0
1	51 to 60	16	0.5
2	41 to 50	89	2.8
3	31 to 40	503	16.0
4	21 to 30	2 204	70.0
5	18 to 20	307	9.8
	Total	3 120	99.1

Figure 3-3: Pie chart count of age

Pie Chart Count of Age
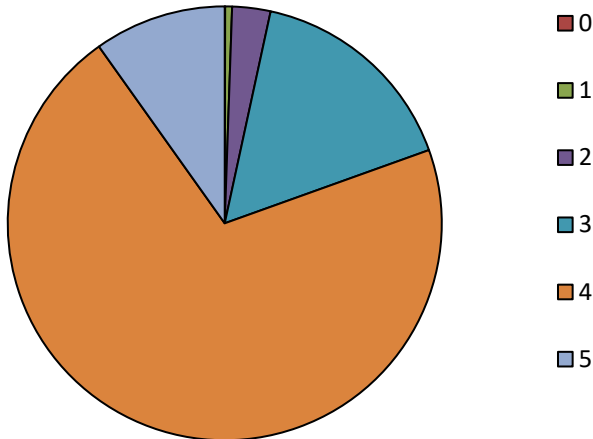
The distribution was deliberately focussed on the age group 21 to 30 as the problem of unemployment is most severe amongst the youth of South Africa. The low number in the 61 plus category meant that this group were excluded and even the group aged 51 to 60 could not be analysed.

3.4.5 Highest Level of Education
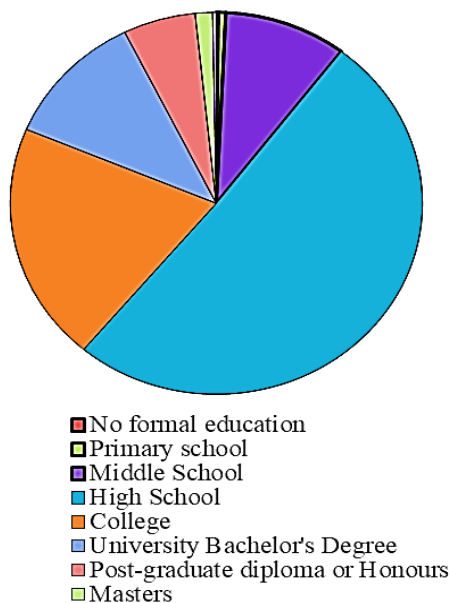
Figure 3-4: Pie chart count of highest level of education

Table 3-5: Highest level of education frequency

Highest level of education	#	%
No formal education	5	0.2
Primary School	18	0.6
Middle School	300	9.5
High School	1 580	50.2
College	629	20.0
University Bachelor's degree	353	11.2
Post-graduate diploma or Honours degree	177	5.6
Master's degree	42	1.3
PhD	9	0.3
Total	3 113	98.9

The pie chart in Figure 3-4 shows that 50% of the sample have some high school education. The question did not ask the highest grade passed so it should not be assumed that this group had all passed matric.

3.4.6 Currently Studying

Table 3-7: Currently studying frequency

Currently studying	#	%
Full time	1 020	32.4
Part time	453	14.4
Not studying	1 652	52.5
Total	3125	99.3
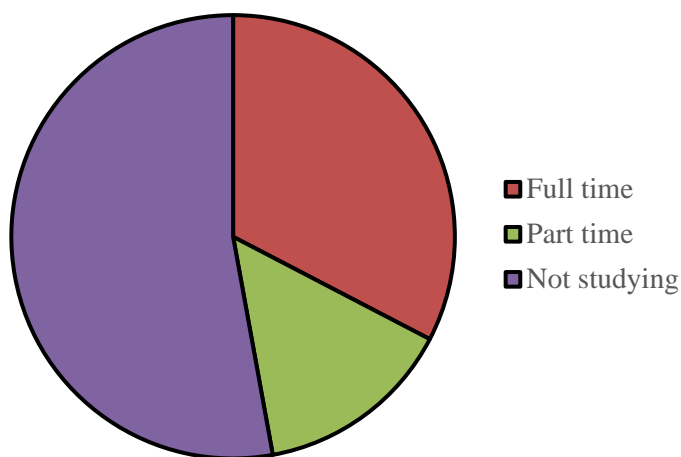
Figure 3-5: Pie chart count of studying this year

A high percentage of the sample were studying. Almost a third were full time students and a further 14% were studying part time. Since 70% of the population are in the age group 21 to 30 and nearly 75% of the respondents who are in this age group are unemployed this seems to imply that the unemployed youth are indeed interested in getting further education (see F.4 in Addendum F for support for this statement).

3.4.7   Employment Status

Table 3-8: Employment status frequency

Employment status	#	%
Retired	11	0.3
Not employed	2 177	69.2
Partially	231	7.3
Full	710	22.6
Total	3 129	99.4
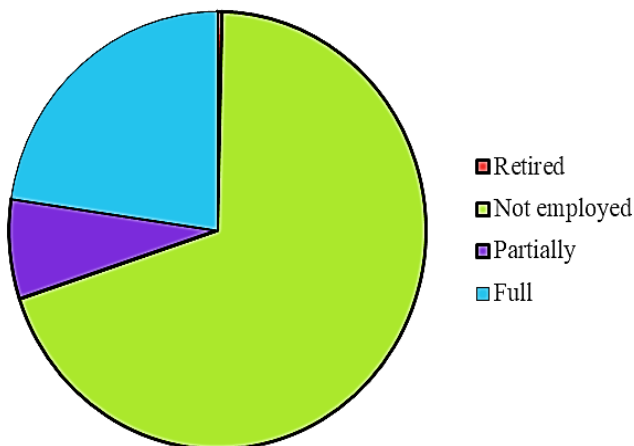
Figure 3-6: Pie chart count of employment group

There is an extremely high percentage of unemployed people in this sample. The official unemployment rate from StatsSA is 23.3%.[9] However, the definition used by StatsSA is: "Someone is considered to be unemployed if they capable of working or starting a business but had not done so. In addition, they need to have actively looked for work or tried to start a business at some point in the four weeks preceding the survey".[10] The respondents to the survey might well have had a less formal understanding of the term and this would account for the discrepancy. Hence, the people included here as

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[9] http://www.statssa.gov.za/?page_id=737&id=1; Accessed October 26, 2020.
[10]https://africacheck.org/factsheets/factsheet-unemployment-statistics-in-south-africa-explained; Accessed October 26, 2020. This source provided the definition in 2014, but it has not changed.

unemployed are likely to include discouraged job seekers and persons considered to be economically inactive.

A person is considered to be economically inactive if they were able and available to work in the week prior to the survey but did not work, did not look for work and did not try to start their own business. This includes people such as university students and adults caring for children at home.

3.4.8 Most Frequent Internet Access

Table 3-9: Internet access frequency

Internet access	#	%
Do not access it at all	146	4.6
Friend's / Relative's house	86	2.7
School / University or NEMISA CoLab	256	8.1
Home or on my own mobile device	1 915	60.9
Cybercafe / Internet cafe	135	4.3
Free Wi-Fi zones including a public library	346	11.0
Telecentre / Community centre	56	1.8
Workplace	164	5.2
Other	19	0.6
Total	3 123	99.2

■ Do not access it all
■ Friend's/ relative's house
■ School/ university or NEMISA coLab
■ Home or on my own mobile device
■ Cybercafe/Internet cafe
■ Free WIFI zones including a public library
■ Telecentre/ community centre
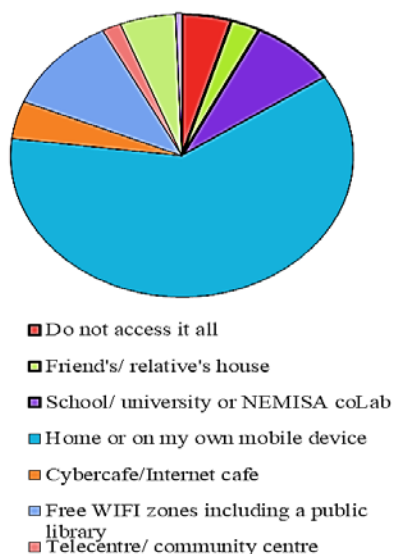
Figure 3-7: Pie chart count of most frequent internet access

The most frequent way of accessing the internet is via personal devices (nearly 61%), with the next most frequent choice selected by only 11% of the sample.

3.5   Personal Circumstances

These questions come from Section C of the questionnaire and are considered to influence the students' decision whether to enrol for a MOOC course.

3.5.1   *Previous Experience of Online Courses*

A third of the sample said that they had previously registered for an online course (Table 3-10). See also Section 3.6.6 and Addendum H for a detailed breakdown of these in terms of province, gender, racial group, age, highest level of education (HLE), whether they are currently studying, and most frequent ways of accessing the internet.

Table 3-10: Frequency of previously registered for an online course

Previously registered	#	%
No	2 137	67.9
Yes	1 000	31.8
Total	3 137	99.7

Surprisingly, the reliability measure (Cronbach's Alpha value in Table 3-11) of the questions in the CPL group is higher than 0.7. This appears to indicate that completing an online course, gaining a certificate, and completing a UNISA module measure the same thing.

Table 3-11: Reliability statistics for completed courses questions

Cronbach's Alpha value	Cronbach's Alpha value based on standardised items	No. of items
.722	.717	3
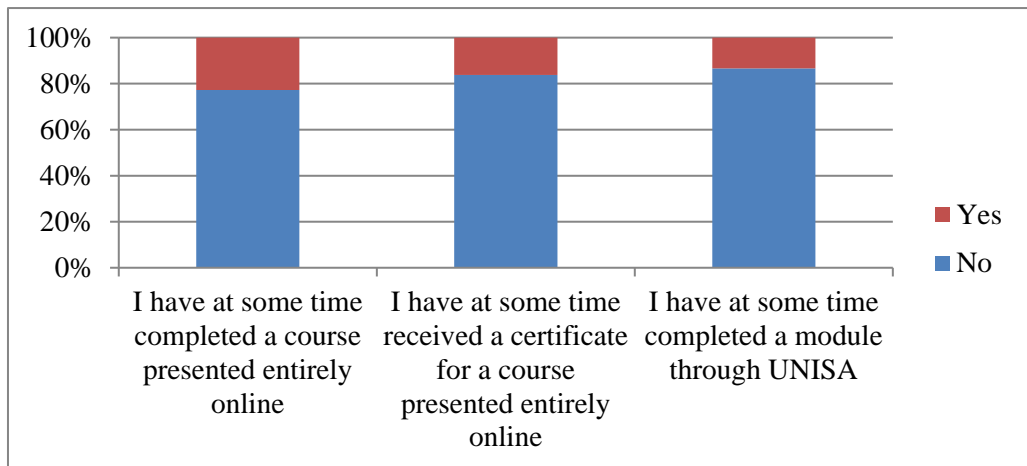
Figure 3-8: Comparing the responses for the three completed course questions

Of the 24% (713) of the respondents who said they had completed a course presented entirely on line, 71% (507) said they had received a certificate. As noted above, exactly 1 000 respondents said that they had at some time registered for an online course. Therefore, although the researchers did not ask how many had started a course but did not complete it, it appears to be 28.7%. Of those 713 respondents who completed a course presented entirely online, 417 (58%) did a UNISA module, indicating that approximately 42% did online courses through HEIs other than UNISA. It is important to note that the authors phrased the question at the smaller course length of a module as this is more comparable to a MOOC.

3.5.2   Barriers

Table 3-12: Frequency of barriers to using MOOCs

Barrier	Yes		Not applicable
The available internet is too slow to download big files	1 330	42%	1 809
I have to travel far to access the internet	1 163	37%	1 977
We do not have internet	1 112	35%	2 027
I sometimes need access to face-to-face help accessing the internet i.e. ICT support	1 042	33%	2 097
We have problems with electricity (it is frequently off for more than 8 hours or even days)	977	31%	2 163
It is difficult to communicate with the lecturer	927	29%	2 211

Table 3-12 is sorted from most often selected to least often selected. Issues regarding internet availability and telecommunications infrastructure and affordability impact on the uptake of MOOCs. The authors have not calculated how many respondents noted

only one issue, how many identified two problems, etc. However, internet speed is clearly a major problem; and for each of the communication issues individually, almost a third of the students considered that inadequate service was a barrier to registering for a MOOC in Telecommunications. Thus, access to other necessary infrastructure is a major issue that has come to the fore in South African education at all levels during the lockdown necessitated by the COVID-19 pandemic.[11] However, as noted in Section 3.2.3, context is an important factor related to social accessibility and related access to opportunities in all countries (see Hayes 2015 cited in Czerniewicz and Rother 2018). Social circumstances and norms can hinder access to information technology (Alexander and Phahlamohlaka 2006).

3.6   Cross-Tabulations between Variables

3.6.1   Overview

Cross-tabulations between the demographic variables are not intended to fully describe the situation throughout South Africa. However, the sample used represents those in the full population who are most in need of additional qualifications.

In all cases where cross-tabulations are made between demographic variables and others, Cramer's V is considered to be the appropriate associational statistic to use as at least one of the variables is nominal (Morgan et al. 2019). Cramer's V is also used for cross-tabulations with more than 2 x 2 cells. Cramer's V indicates the strength of association (hence, belongs to the *r* family) and a strong association could be close to 1.0 or –1.0. A value close to zero indicates no relationship. However, under some conditions, the maximum possible value of Cramer's V is much lower than 1.0. It is possible to have a statistically significant relationship with $p < .001$ even when the Cramer's V value is small.

Note, the graph shows counts rather than percentages and this may be misleading as there were bigger populations of respondents in some groups (e.g. some provinces, racial groups, unemployed, etc.). The tables show percentages, and hence, give a clearer picture.

Cramer's V was used to assess the associative strength and statistical significance of the results. In almost all cases, the associations were found to be weak, but the significance was 0.000 (i.e. very significant). The few incidents of a high significance level are highlighted in the tables of findings (Table 4-4) and (Table 5-2). The Phi, Cramer's V and Kendall's tau-b are all shown in Addendum E in order to confirm the relationships as Cramer's V can be difficult to interpret. However, not all authors agree: for example, Saunders, Lewis and Thornhill (2016, 541) say that "unlike Cramer's V, using Phi to

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[11]   https://www.gstic.org/inspiration/how-covid-19-has-exposed-the-challenges-for-technology-in-education; Accessed October 16, 2020.

compare the relative strengths of significant associations between pairs of variables can be problematic". Hence, the discussion and further investigation into the strengths of the associations will be left for an academic discussion elsewhere. The authors simply report as above that the associations were found to be weak, but the significance was 0.000 (i.e. very significant).

Note, the bar charts in Addendum E show counts rather than percentages and this may be misleading as there were bigger populations of respondents in some provinces.

3.6.2 Post-Primary Education with Demographic and Other Variables

Preamble

- The numbers of people with no education at all or only primary school education were very low and, therefore, these were excluded.

- The data for those studying at, or already completed Honours, Master's and PhD studies were grouped together as otherwise the data in many of the cells was unacceptably low.

See also Addendum E.

Province

The educational profiles of the provinces vary greatly; for example, for the Bachelor's and particularly for Postgraduate HEL, Limpopo has percentages considerably above those of the full sample. KwaZulu-Natal and North West have very low percentages for all the tertiary education levels. Free State has a high percentage for college but not for any level of university degrees. Hence, the requirements for MOOC contents may vary widely across provinces, although these findings need to be confirmed.

Gender

No significant differences are reported in the statistical analysis for post-primary education by gender. This is different from the significance levels for the Cramer's V analysis obtained for most of the other cross-tabulations. This result indicates that in South Africa there is equal access to education and equal uptake of education by males and females.

Racial Group

Coloured students seem to be lagging slightly regarding progression through the educational system compared to other groups. More Indian students are reported to have attended high school than other groups but the Indian respondents seem to choose other forms of tertiary education rather than college education.

Age

The group aged over 50 was too small to be included in the analysis of post-primary education. The groups aged 41 to 50 and 31 to 40 have very similar percentages at all levels of education. These respondents were born in 1990 or before, that is, in the apartheid era. High school education attendance percentages improve markedly for those respondents aged younger than 31 years. The vast majority of respondents with high school education (about 70%) are in the 21 to 30 group and even more of the group under 21 years old had a high school education (but that group is relatively small compared with the number of people in the sample aged from 21 to 30).

Most Frequent Internet Access

According to the data collected, the most frequent way of accessing the internet by far is by using a mobile device. However, groups with different levels of post-primary education made different choices for the second most frequent way of accessing the internet. These are highlighted in the table in Section E.5 of Addendum E, but they are so much less often selected than mobile devices that it seems only access via a mobile device needs attention. However, as will be seen later, this may depend of the purpose of accessing the internet.

3.6.3 Employment with Demographic and Other Variables

Preamble

These cross-tabulations are shown in detail in Addendum F. Highlights are discussed here. In these cross-tabulations retired persons were excluded in order to reduce the number of cells in the tables with very low counts. Hence, the totals disagree slightly with the frequencies given in Section 3.4.7. The options for Partially employed were not selected often. Fully employed includes self-employed, while Not employed includes currently unemployed, never employed and full time students. Obtaining useful and comparable unemployment statistics from questionnaires is difficult as the respondents do not use the "official" definitions of employed and unemployed as they are used by StatsSA. The overall percentage of respondents in the sample who were Not employed was 69.8%.

Province

There are anomalies regarding the percentages given for unemployment in Limpopo (41.5%) compared with the percentage for the complete sample (i.e. all provinces) of 69.8% and Western Cape (37.7% compared with 69.8%). There are correspondingly high percentages for Fully employed in these two provinces. However, in both provinces there is also a higher percentage of partially employed workers (16% for Limpopo) compared with the number for the complete sample (i.e. all provinces) of

7.4% and 15.4% for Western Cape. This may reflect the high number of seasonal workers in these two provinces.

Although the reasons for this occurrence can be surmised, there is no basis for the assumptions.

Gender

Despite the fact that in this sample women have similar levels of education (hence, the national education system is not discriminating against women), the same is not true regarding employment opportunities. As expected, females have lower employment than males (73.4% of women are unemployed versus 66.1% of men).

Racial Group

The unemployment percentages are as commonly reported and are very unequal (Not employed ranged between a high of 74.6% of Black respondents to 43.6% of White correspondents). A high percentage of the total sample was Black as expected from the quota sampling strategy used.

Age

The cross-tabulation of Age with Employment (see F.4 in Addendum F) shows a small number of respondents aged 51 years or more. Unemployment was high in the category 21 to 30 years (74.1%) and extremely high in the category 18 to 20 years (90.8% of this group were not employed, but this percentage decreased in the older categories). However, many of the respondents younger than 31 years were full time students (see Section 3.6.4). A high proportion of those answering the questionnaire were aged from 21 to 30 years.

Highest Education Level

In the sample, the largest group by a considerable margin had attended high school but the question did not ask what highest grade was passed. Although there are still high levels of unemployment even amongst postgraduates (39.2% unemployed), this does decrease significantly with increased tertiary education. Secondary school education makes little difference. Those with primary school education only, middle school education and those with some high school education all have Not employed percentages above 76% – this may be because the "high school" category does not necessarily reflect gaining a Matric certificate and many of these people might still be studying (see the next section). Future research could look both at educational levels completed as well as those partially completed or the level at which the respondent is currently studying.

Currently Studying

Understandably, the full time students were largely Not employed (87.4%), whereas 44.4% of the part time students had part time or full time employment. However, attributing causality needs to be avoided – they may be studying because they cannot find work **or** they may not be seeking employment because they are studying. However, nearly two thirds (63.1%) of people who were not studying were unemployed. Targeting this Not studying and Unemployed group may be a strategy to consider. Fully employed people are not inclined to study, but they might be in low-level employment and not see how studying could help them.

Most Frequent Internet Access

Taking into consideration the numbers of respondents who chose this option, by far the most frequent way of accessing the internet was via mobile phone (69.1% of those selecting mobile phone to access the internet as the best option are Not employed and 23.7% are full time employed respondents). However, for those accessing the internet at work, understandably 74.4% are employed full time; 452 fully employed respondents said that mobile phones were their preferred option versus 122 fully employed people who said that the internet at work was the best option (the second most popular choice for this group of respondents).

3.6.4   Currently Studying with Demographic and Other Variables

Preamble

These cross-tabulations are shown in detail in Addendum G and only the highlights are discussed here. The overall percentage of the sample Not studying is 52.9%. It is not possible to say whether the groups with higher percentages of Not studying are not interested or do not have the opportunity to study, but this is worth investigating.

Province

Limpopo, Western Cape and Northern Cape have a disproportionate number of people Not studying (72.2%, 71.4% and 72.5%, respectively). Western Cape and Limpopo also have surprisingly low unemployment. Is there a connection? This raises the need for further, future investigation.

Gender

Similar (almost equal) Not studying figures are reported between the genders (Male – 54.1%; Female – 51.6%). This is reflected in a less significant *p*-value (0.051) in the Cramer's V test, but this value is marginal (could be considered to indicate a significant difference). This is consistent with the HLE findings (see under Section 3.6.4).

Racial Group

A high percentage of Indian respondents are studying full time (62.2% compared with the full sample total of 32.7% studying full time), but this was a relatively small section of the sample. The racial group that has the largest percentage not studying is Coloured (62.9% compared with the full sample total of 52.8%).

Age

As could be expected for Age,[12] full time students are young (30 years old or younger) and account for the largest segment of people studying (763 plus 195 out of 1 008 full time students). Part time students are largely between the ages of 21 and 40 (300 plus 115 out of 448 part time students).

Highest Level of Education

The statistics for the HLE for those currently studying is worth a close scrutiny. Firstly, they may still be completing the qualification listed as their HLE. Apparently 71 full time students (who had be older than 18 to take part in the survey) have only previously attended middle school. Compared with the 30% of those whose HLE is middle school who are currently studying full or part time, 48% of respondents with HLE of High School are currently studying (this is the biggest group in terms of number), 49% with some college education are currently studying, 66% of those with (or working towards) a Bachelor's degree are currently studying. These totals drop slightly for higher degrees and the total numbers of respondents are low in those categories.

Most Frequent Internet Access

Once again, mobile devices are the clear overall choice for accessing the internet. Free Wi-Fi zones and the internet at work are used to some extent (but much less than mobile devices) by those not currently studying. However, facilities at the HEIs where they are studying are important for only about 20% of those studying full time (1 016 respondents) and free Wi-Fi zones by about 10% of the respondents in this group.

3.6.5   Internet Access and Two Other Variables

Table 3-13: Symmetric measures

		Value	Asymptotic standard error[a]	Approximate T[b]	Approximate significance
Nominal by	Phi	.342			.000

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[12] The youngest Age category covers only three years while the other categories each span 10 years – this might give the wrong impression – 195 full time students are in the three year category 18 to 20 and 763 in the longer 21 to 30 group.

nominal	Cramer's V	.171			.000
Ordinal by ordinal	Kendall's tau-b	.112	.016	6.727	.000
No. of valid cases		3 074			
a. Not assuming the null hypothesis.					
b. Using the asymptotic standard error assuming the null hypothesis.					
According to Cramer's V this is a weak but significant relationship.					

Figure 3-9: Bar chart of formal education and internet access
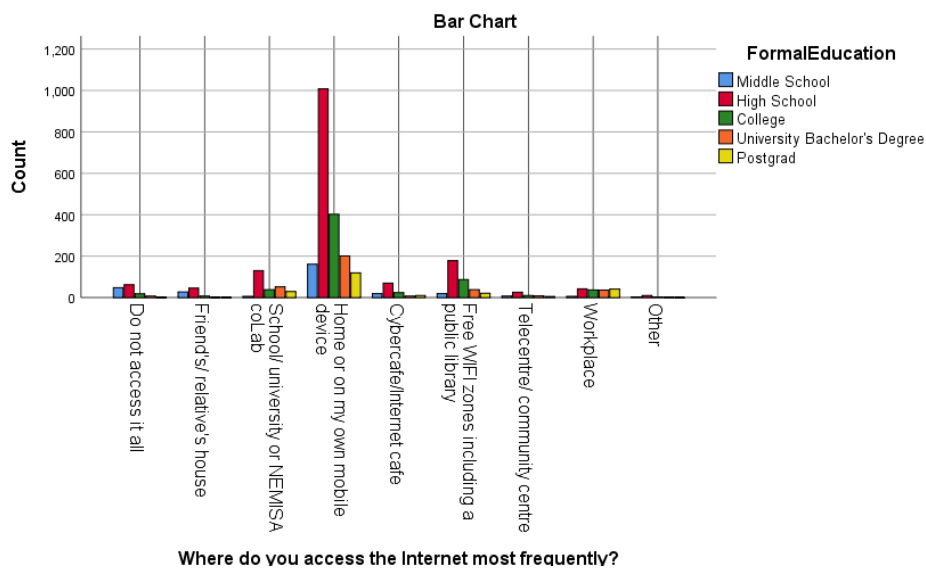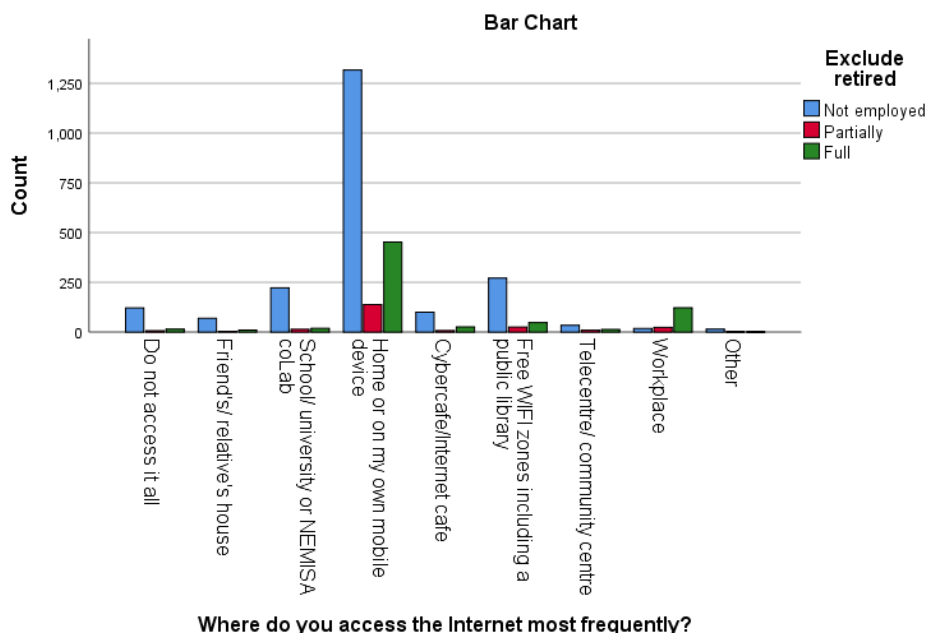
Figure 3-10: Bar chart of internet access by employment

3.6.6 Previous Experience of Online Learning with Demographic and Other Variables

These findings are in Chapter 5 as they shed light on matters relating to completion of short courses.

3.7 Recommendations

3.7.1 Addressing the Needs of Diverse Groups

The cross-tabulations in Section 3.6 found that significant differences are evident between different categories in the different ways in which the respondents were grouped (demographic questions in Section A of the questionnaire). The only exception was in terms of gender in terms of existing access to education and short online courses (see Chapter 5).

Based on these findings a "one size fits all" approach will not be appropriate for a national policy supporting the introduction, maintenance and facilitated adoption of MOOCs.

This clearly leads to the main and most far-reaching recommendation:

Recommendation 1A: National policy should target those most in need: Either the policy must incorporate a single strategy aimed only at those groups most in need of assistance in accessing, encouragement to register and support to increase completion rates.

OR

Recommendation 1B: National policy should allow for a multiplicity of needs: A very flexible approach, allowing for multiple needs to be addressed, will be required.

3.7.2 Barriers Relating to Infrastructure

Recommendation 2: Useful information may be obtained regarding the barriers to studying through MOOCs (see Section 3.5.2 and it is revisited in Section 7.3.1) but it is proposed that these issues are already quite well known and are receiving attention.

3.8   Conclusion

The findings in this chapter have revealed that different demographic groups in South Africa have significantly different profiles in terms of their HLE; whether they are currently studying; their employment status; and internet access. However, there were no marked differences between males and females regarding access to and uptake of education in general (HLE, whether currently studying). These findings regarding unequal access to education and to information via the internet are indicative that barriers as discussed in Section 3.5.2 limit access to education by some communities.

Recommendations (there are others in subsequent chapters) are:

- Targeting the Not studying and Unemployed groups may be a strategy to consider.

- Limpopo, Western Cape and Northern Cape have a disproportionate number of people Not studying (72.2%, 71.4% and 72.5%, respectively). Western Cape and Limpopo also have a surprisingly Low unemployment. Is there a connection? This raises the need for further, future investigation.

- Currently, previous registrations for online short courses are highest in Gauteng and lowest in Northern Cape, Eastern Cape and Western Cape. The reasons for this are unclear and this would be an interesting and relevant line for future research.

One cross-tabulation is particularly important, namely, between previous experience of online learning with demographic and other variables. Understanding who has previously chosen to register for a short online course (even though these were not necessarily MOOCs) and how successful they were, provides useful insights.

Although all the analyses of the most frequent internet access method overwhelmingly point to mobile devices, those who had completed short online courses in the past selected several public venues as equally important. Hence, Telecentre/Community centre (23.6%) and Workplace (21.9%) are slightly more popular options, while Own mobile (15.7%) and Friend's/Relative's house (16.3%) are the least popular. This is an extremely important set of findings. Whereas internet access for entertainment or social networking and communication may be extremely popular, this set of results indicate that it may not be as useful for studying online courses.

Chapter 4: Motivation to Register for a MOOC

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4.1   Introduction

4.1.1   Research Question

The research question explored in this chapter is: What would motivate potential students to register for a MOOC?

4.2   Behavioural Change

This is the first of the four identified themes and it is change oriented, that is, it seeks ways of motivating potential MOOC students to try something new (Czerniewicz et al. 2017a; Henderikx, Kreijns and Kalz 2017b). The behavioural change the authors are wanting to encourage is to register for a MOOC. Topics are discussed in terms of the MUM dimensions (external, personal, technology and interaction in the learning process). As noted by the workshop participants, the authors should not underestimate the difficulty of getting people to change the way they are accustomed to learning as this has been deeply entrenched in their childhood.

A widely accepted theory of change describes punctuated equilibrium. This, together with advice from a very highly regarded management consultant and author on change management, Dr John Kotter, is included as the "classic" literature for this chapter. Although these are generally applied to managing change in organisations, the proposal made here is that potential MOOC students are interacting with an organisational structure (the MOOC platform) and are "doing work". Hence, although they may initially be self-motivated, the theories and change management strategies applied to organisational change have a great deal to offer. The literature review for this chapter, as in the other chapters, remains brief.

4.3   Factors That Influence a Decision to Register for a MOOC

Figure 4-1 shows the part of the MUM (see Figure 2-3) that relates to the research question.
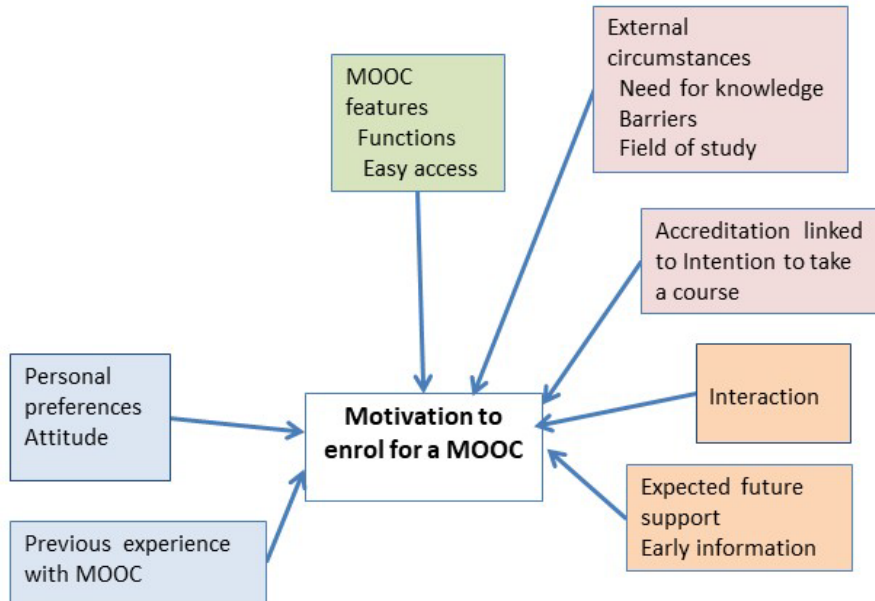
Figure 4-1: The MUM concepts related to motivation to register

As before, the blue blocks focus on personal factors, although the authors recognise that attitudes and previous experience are all shaped to some extent by external factors and circumstances (people, events, place and time). The green block relates to the design and implementation of the technology which occurs separately from the student but which the students will assess in terms of it matching their needs. The pink blocks depict external factors, such as requirements stipulated by employers, access to technology and other barriers and suitability of MOOCs in a particular field of study. Note that the importance of accreditation to the potential student is relevant to this theme although it is covered as a separate research question in Chapter 6. Accreditation also occurs as a subtheme in the first three themes. The orange blocks are specifically related to the process of teaching and learning offered by the MOOC.

MOOC-student fit should be the fundamental consideration for a potential MOOC student and is the basis of intrinsic motivation to enrol for a MOOC. Individual differences (i.e. how well the MOOC fits the needs of an individual) means that a MOOC cannot be made equally attractive to everyone (Tracey, Swart and Murphy 2018). The MOOC-student fit assesses each element and whether the potential MOOC student's perceived requirements are sufficiently well aligned to encourage registration for a MOOC. Hence, this chapter looks at all the elements of Figure 4-1. This is an issue is of major importance that is also reflected in Section 7.4. It is a fundamental requirement that the specific needs of South African (and also African) MOOC students be taken into account. If this were not the case, there would be no need for a South African MOOC portal at all.

4.4   The Decision-Making Process in Deciding to Register for a MOOC
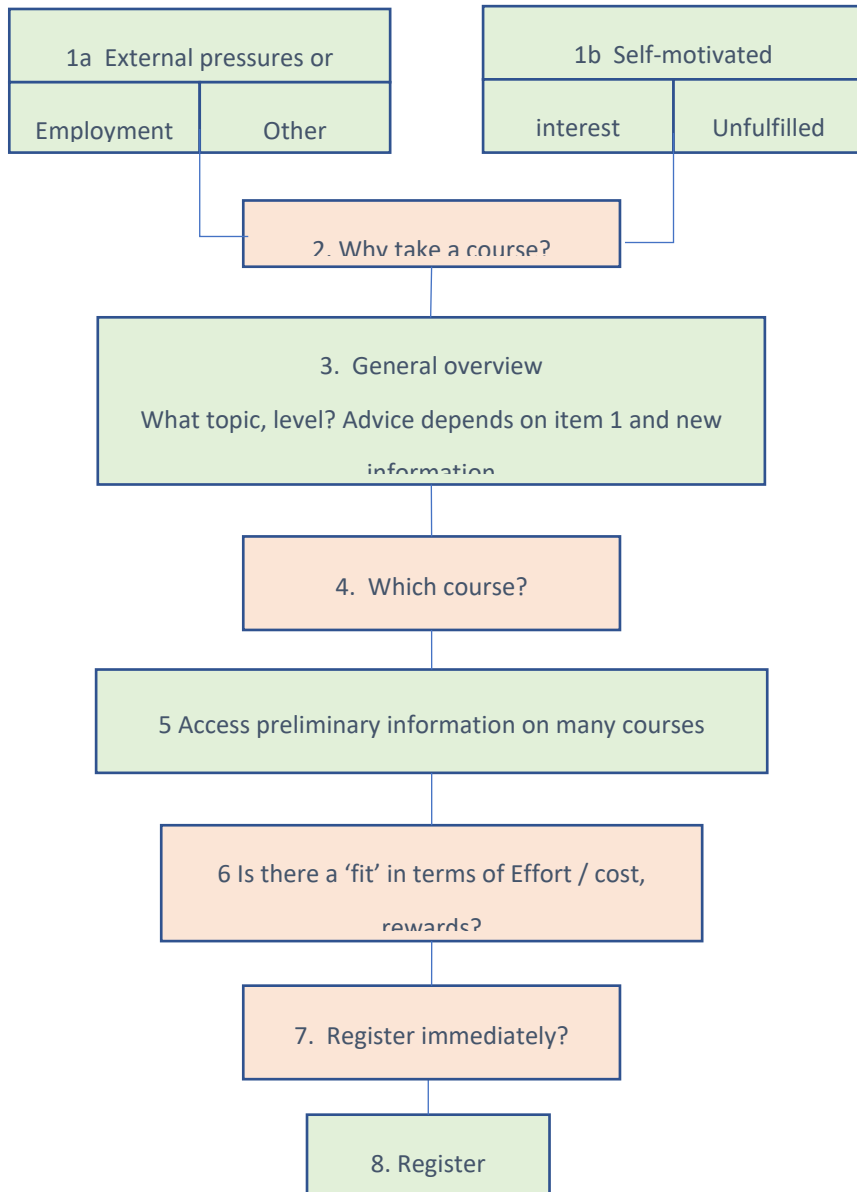
Figure 4-2: Information as a basis for registering for a MOOC

Figure 4-2 outlines the phases that may occur as the potential MOOC student considers whether to register for a MOOC. The Fogg Behaviour Model (FBM) (Fogg 2009) is used here to understand the initial behaviour related to registering for a MOOC. It can

also be used in the second theme (see Chapter 5) to understand the behaviour required to complete a MOOC.

In Figure 4-2, the trigger referred to in the FBM is implied as it prompts the question "Why take a course?" The question may be triggered by an external event or person who suggested the need for a qualification or new skills (blocks 1a and 1b in Figure 4-2). Thus, the question is raised (block 2) and benefits are suggested (motivation). However, in some cases the person who adopts a new behaviour may decide on this route entirely independently. For example, someone might have become interested in a particular topic without being influenced directly by any external event and without expecting that increasing his or her knowledge of the topic will have rewards or benefits obtained from external sources (Tracey, Swart and Murphy 2018). Hence, the motivation is intrinsic, and the only reward is a feeling of accomplishment or personal satisfaction. That person might decide that the knowledge could most effectively and efficiently be obtained by registering for a MOOC. Tracey, Swart and Murphy (2018) found that pre-course motivation, have a considerable effect on their perceptions of the value of the course with intrinsic motivation having a positive effect while pressure from external sources has a negative effect.

Figure 4-2 proposes that when registering for a MOOC the decision is made in stages; additional information needs to be obtained (blocks 3 and 5) before deciding on a particular MOOC. This search for information must be relatively easy; as the FBM points out, if the perception of skill required and the effort in terms of time and success are too high the project will be abandoned. The discussion that follows suggests what information is needed for the early part of MOOC uptake, namely, prior to the decision being made to register for the MOOC.

4.5 Literature Review

4.5.1 Motivation and Persuasive Technology

Fogg (2009) focusses on ways in which technology can assist in changing behaviour. MOOC platforms are an example of a persuasive technology as they require students to develop a new learning behaviour that is sustained, and MOOC platforms are designed for that purpose (Wilde 2016). The FBM proposes three principle factors that must be present concurrently for a target behaviour to occur, namely: (1) motivation (the expectation of benefits); (2) the ability to perform the behaviour; and (3) a trigger to perform the behaviour. Sibanyoni's (2020) work shows clearly that it is essential to understand motivation; to determine the rewards that a particular group of students consider valuable; and to build both appropriate rewards and ways of assisting students to move from the expectation of a concrete reward to intrinsic motivation and a personal

sense of achievement. His work also shows that a single set of rewards does not work equally well for diverse groups.
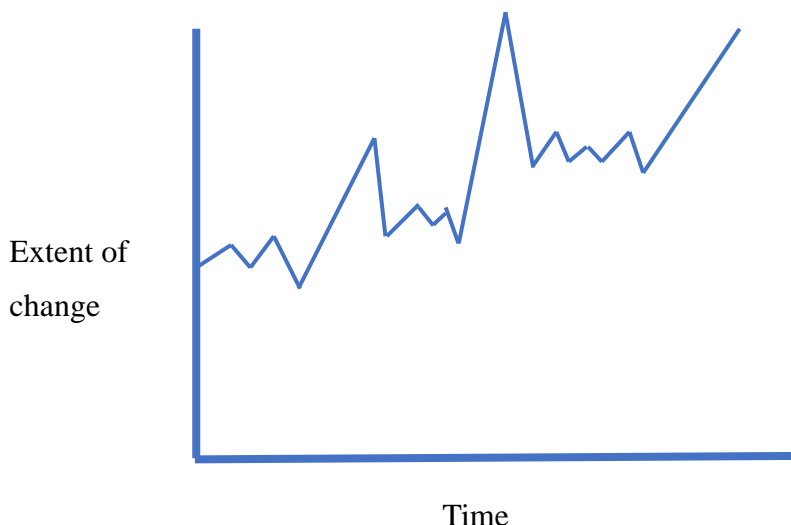
Figure 4-3: Punctuated equilibrium view of change

Source: Sibanyoni 2020; Sibanyoni and Alexander 2017; 2018

4.5.2   Punctuated Equilibrium

The punctuated equilibrium view of change illustrated in Figure 4-3, argues that systems (including those in organisations) have periods of gradual, incremental change interspersed with periods of revolutionary or transformational change (Gersick 1991; Romanelli and Tushman 1994; Van Tonder 2004). This view explains that the system changes all the time – there are no periods of total stability. This is in contrast with the rational-purposive view of planned change described as UnFreeze-Change-Refreeze (Lewin's 3-Stage Model of Change) (Lewin 1951 cited by Van Tonder 2004). Innovation and so-called disruptive technologies can trigger periods of unplanned, transformational change. The 4IR is an example of an extended period of far reaching changes in the workplace and affecting the workforce that was triggered by new technologies (Alexander and Twinomurinzi 2012; Twinomurinzi and Ismail 2018).

Table 4-1: Application of Kotter's (1995) 8-stage process to uptake of MOOCs

Step	Quoted from Kotter (1995)		Time
1	Create a sense of urgency	Help others see the need for change through a bold, aspirational opportunity statement that communicates the importance of acting immediately.	Must be communicated before the decision is made by a prospective MOOC student to change his or her learning behaviour.
2	Build a	A volunteer army needs a	The prospective MOOC students

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		coalition of effective people – born of its own ranks – to guide it, coordinate it, and communicate its activities.	will be influenced by more senior staff in their organisations and by community leaders and elders.
3	Form a strategic vision and initiatives	Clarify how the future will be different from the past and how you can make that future a reality through initiatives linked directly to the vision.	The vision communicated by key people persuades students that benefits can come from studying further and studying online. The decision to change learning behaviour is based on the shared vision.
4	Enlist a volunteer army	Large-scale change can only occur when massive numbers of people rally around a common opportunity. They must be bought-in and urgent to drive change – moving in the same direction. It's not a project. It's a movement. It's a journey. Join us and leave your mark.	Large-scale change is established over time and a roll out strategy is needed. Attracting registrations every year depends on recruitment strategies. Individual courses, MOOC platforms and national programmes to encourage and facilitate the uptake of MOOCs cannot survive without sufficient numbers of registrations.
5	Enable action by removing barriers	Removing barriers such as inefficient processes and hierarchies provides the freedom necessary to work across silos and generate real impact.	Barriers to the uptake of MOOCs include inadequate infrastructure, cost of implementation and operating costs. These barriers are disincentives to potential MOOC students and need attention early in the project.
6	Generate short-term wins	Wins are the molecules of results. They must be recognised, collected and communicated – early and often – to track progress and energise volunteers to persist.	Early efforts should remove barriers that are encountered during the process of deciding to register, like difficult to find information and not being able to register easily.
7	Sustain acceleration	Press harder after the first successes. Your increasing credibility can improve systems, structures and policies. Be relentless with initiating change after change until the vision is a reality.	This is for later stages of the MOOC portal development process.
8	Institute change	Articulate the connections between the new behaviours and organisational success, making sure they continue until they become strong enough to replace old habits.	This applies only after the student has successfully completed the first MOOC. The successes are individual and organisational. Passing the MOOC and getting a job is immensely valuable to that person. Significant numbers of individual successes will have

			economic and social impacts for the country.

But not all the triggers are man-made; natural phenomena, such as the Coronavirus pandemic, can create conditions that require major changes to almost all aspects of living. These periods can be a window of opportunity where, by force of circumstance, changes occur in parallel and resistance to change is reduced. This can be an opportunity to implement additional changes, the need for which had been identified earlier. The irreverent statement "never let a good crisis go to waste" reflects this view: "In almost every case, the existence of a later spurt of adaptive activity at BBA was associated with a specific, disruptive event in the project life cycle" (Tyre and Orlikowski 1994, 30).

4.5.3 Strategies for Managing Change

The eight steps of change management in organisations are practical advice for introducing significant change into organisations. They are presented in Table 4-1.

4.6 Findings from the Workshops

Kotter and Schlesinger (1979) make additional valuable remarks. Table 4-2 includes direct quotations. In the case of a Government initiative to promote the uptake and recognition of MOOCs, the advice to the "manager" may be incorporated in policy statements. Quotations from the workshop participants echo some of these statements.

Table 4-2: Quotations from Kotter and Schlesinger (1979)

- Change initiatives often backfire because managers apply one-size-fits-all approaches. For example, they attempt to combat resistance to change by involving employees in the initiative's design even when employees don't have the information needed to provide useful input.

- To lead change, tailor your strategies to the types of resistance you'll encounter. For instance, with employees who fear change, provide skills training. Consider situational factors. For example, to avert an imminent crisis, change quickly – even if that intensifies resistance.

- If resistance stems from employees' lack of information, use education to communicate the reasons for the desired change. Once educated, people often become supportive, though this method can be time consuming if it involves large groups.

- If you want resisters to become more committed to the change, encourage their participation in its design or implementation. This method increases grassroots

support for change but can cause problems if people lack the expertise to develop effective plans.

- If people fear they can't make needed adjustments, provide skills training and emotional support. No other approach works as well with adjustment problems, but it can be time consuming and expensive.

- If powerful people or groups are resisting because they'll lose out as a result of the change, use negotiation – offer incentives for complying with the change. This is a relatively easy, if expensive, way to defuse major resistance.

- If speed is essential, use coercion – threaten firing or transfer or loss of promotion opportunities. This can override resistance quickly but also spark intense resentment.

4.6.1 Awareness

The rapid evolution of technology is disrupting the workplace and a full awareness of the need for continuous education and training in the workforce is needed by managers in many businesses. Hence, campaigns promoting the uptake of MOOCs may need to start by building awareness at this level. Some employees may be reluctant to learn new skills.

One of the workshop participants said:

> They have the skills, now you say go and do something else, they need to do a certification on that. How do you get those people there and keep them there and make sure that they get motivated? That's the thing that we need to look at, how do you make sure that you move people around and motivate them to be skilled in different areas?

Hence, there may be resistance to training by the workforce and this needs to be overcome. The role of extrinsic motivation (Figure 4-2, block 1a) to initiate registration for a course should not be under-estimated.

Awareness building must be in terms that make sense to the intended recipient. In the words of a workshop participant who works with communities:

> I had to change the language, I had to change the focus, the emphasis, because we could sit here as experienced or educated people in the technology space or the business space but we will have to put it in the context or the language of the socioeconomic status of the audience … So we should not be training a bunch of people to do that and send them out, we should be running programmes to take the people who are already there and train them on how to bring in their contribution.

This point was endorsed by others who are actively involved with rural communities.

Major innovations start with a vision of a new way of doing business at this may come from anyone in the business.

Providing those looking for information on which to base their decisions regarding the choice of a MOOC with appropriate amounts of information is essential. Structured information about the MOOC platform and MOOCs on offer allows for an increasingly confident assessment of fit between the MOOC and the personal and learning needs of the student. In the case of a MOOC, this initial information outlines what the course covers, and the level of skill or knowledge achieved when it is completed (outcomes). The introductory information for the MOOC platform often provides information to establish the reputation of the platform. The awareness group of codes came up frequently in the analysis of the data from the workshops.

4.6.2   MOOC – Environment

Introductory information highlights the relevance of the course within a social and economic environment. It may locate the MOOC as a component of a learning pathway linked to a career and may suggest outcome expectations in terms of employment opportunities (see Lent, Brown and Hackett 1994). For example, the information provided may show an increase in the number of students who have enrolled for the MOOC over time as it establishes its popularity.

In the words of one of the workshop participants:

> What will motivate them to go on a particular learning path that makes sense in terms of the skills that are required in the industry and in the country? So you really want to say you must not sell courses, you must sell a pathway to something.

Questions that need to be answered are: Will the MOOC satisfy requirements of the work environment that the student wants to enter? Is registering for the MOOC feasible given existing economic or social circumstances? Issues identified include:

- Practical element (often related to the registration process).

- Relevant skills that will be acquired (external goals).

- Certification - Is there assessment of the students' mastery of the content of the MOOC or just a certificate indicating attendance?

- Credibility (recognition).

- The reputation of the MOOC platform and of the MOOC developers is a motivating factor.

- Is there any formal accreditation of the qualification by an independent authority?

The workshop participants agreed that many potential MOOC students are interested only in accredited or recognised MOOCs. This view was tested in the survey which follows. However, this research question is discussed in Chapter 7.

4.6.3   MOOC – Personal

Introductory information that relates to personal characteristics of students is often provided as a statement of who will find the course useful. The student will evaluate the MOOC in terms of whether it seems to be interesting, achievable, feasible and convenient. Therefore, the student is viewing MOOC characteristics that fit with personal requirements (see also Section 4.3).

Interesting

Is the topic of the course really of interest to this student? Personal goals and intrinsic motivation are important for sustained use and successful completion even when the trigger was outcome expectations (Tracey, Swart and Murphy 2018).

Achievable

Will the MOOC standards be achievable given the potential MOOC student's previous educational background and goals? Does the person who is considering taking the MOOC have sufficient confidence in his or her own ability to achieve this level of competence (self-efficacy)? Kotter and Schlesinger (1979) make suggestions for allaying fear (see the text box provided above) and Bandura (1986) emphasises the importance of self-efficacy. However, a clear statement as to what the students should expect from the MOOC and what will be expected of the students can help them to judge whether the course is achievable. Hence, the introductory information needs to explain *the level* of skills and knowledge the course is aiming to achieve. The registration process may not require proof of the student having this recommended knowledge or skills.

Feasible and Convenient

Does the person considering taking the MOOC have the resources required?

Time available to study is an important resource even if the MOOC costs little. Recommendations regarding study time per week, whether there are set deadlines and access to technology help the student decide ahead of time whether it is likely that he or she will be able to complete the course.

The workshop participants noted that a large group of potential MOOC students were interested only in MOOCs that involved minimal costs. This is particularly important for those who are unemployed.

4.6.4   MOOC – Technology

The workshop participants said that introductory material should be available that explains or demonstrates the technology that will be used. This should allow new users to 'explore' the course and the MOOC platform interface to see whether it fits their needs. If the person has never taken a MOOC course before she may be worried as to whether she has the computer skills required.

- The functionality of the MOOC platform should be explained and demonstrated to potential students before they register so that they can make an informed decision.

- Is there a help desk, easily accessed videos or another form of Help facility?

- What kind of technology is recommended or required (operating system, bandwidth)?

- What media formats are used? Are there alternatives? For example, can material be downloaded and then be used offline?

- The cost of data and slow Internet speeds can make it impossible to use the MOOC.

- Web site design and usability plus user experience factors are important during the period before registration, but some that will only be used later may also need to be introduced (e.g. customised content and interfaces, use of virtual reality).

Ease of use, ability to find required information and previous experience using the device being used to access the MOOC are all important.

The workshop participants discussed technology adoption issues in general as well as popular perceptions of distance learning courses and online learning. It was agreed that individuals might have strong opinions about various issues, but it is not clear how prevalent they are – one size does not fit all (Tracey, Swart and Murphy 2018). In open discussion, two of the participants who have done research on MOOC adoption claimed that the well-known technology adoption models do *not* seem to apply to the

behavioural intention to adopt a MOOC.[13] No literature has been found (but a complete and thorough search was not carried out) to support this view, and hence, it raises interesting possibilities for further research.

4.6.5   Suggested Ways of Overcoming Resistance

Introduce some interactive computer-based activities at schools for all learners from an early age, for example:

> We have to understand that our population is not well trained in how to approach learning so how do you assess your ability to be able to succeed on a MOOC?

> Maybe that's something that should be there as supporting components to teach things like how to write a summary or this and that. The necessary learning discipline should be part of the solution so that if I am not good at something then I should have someone to help me become a better learner. Not content related in terms of subject matter, but skills required in learning. So whatever MOOC we are talking about, we have to get people ready to start and to believe that they are competent and can do it. I think there is a horizontal layer that should be added.

This links with the need for support including pre-registration support and MOOC survival courses discussed in Section 5.2.5.

4.6.6   Suggested Ways of Motivating Uptake

The quotations are from the workshop participants.

Portal

> A portal where there is introductory information about many courses can assist the person looking for information to obtain the answers as it has ways to filter and structure information.

> As an individual it's most difficult to find the right platform that's credible and also if I need spend my money so that's a challenge. If I spend my money I need to be happy after. So I think there needs to be somewhere where that information is available in real terms.

> The big problem that you are dealing with is someone is sitting in a situation where they simply have not got too little information, they have got too much information.

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[13] The adoption models have been found not to be well-supported in the 4IR context either, see: https://doi.org/10.1109/OI.2019.8908220

Learning Pathways

Show "learning pathways that show you if you want to be an analyst – these are the building blocks". The idea of a learning pathway recommending MOOCs that complement one another or that build on knowledge obtained was supported by several workshop participants.

Employability Requires Certification

The experts at the workshop stressed that a major motivation to register for a MOOC was the perception that further education and training would increase the likelihood of employment or career advancement. However, the discussion then included the need for credible evidence in the form of verifiable certificates. This issue is explored in detail in Chapter 6.

Accessibility for Disabled People

Simply providing information in formats that are accessible for disabled people (a dedicated focus on the visually challenged and audio impaired but also for those with limited mobility) is a motivation for those groups to increase their knowledge and skills.

Sections 3.1 to 3.6 describe the survey findings and confirm this point. Although disability is not addressed specifically, it identifies certain groups that have different factors affecting them.

Inclusivity

The point was made in a variety of ways that if the MOOC programme is intended to be of value to students other than the current target market of well-educated people, supplementary services are required: "Competence and conditioning will always be found and attitude … you need a fourth element there and that is a network … also linking people actively to opportunities in the market." As will be seen in Chapter 7, one of the services envisaged by the portal is to help students to connect with employers and employment opportunities:

> Most MOOCs benefit postgraduates or working individuals. There are Grade 8 and Grade 9 learners who are dropping out from school who can benefit from such initiatives – so I think awareness is very important because not many people are aware of MOOCs, what it is, what it does, how can they benefit from it.

Massification of education is a major objective of the South African Government and there is some evidence that the opportunities are being taken up. Nearly 50% of the sample in the survey said they were currently studying and all of them were 18 years old or older (see Section G.4 in Addendum G).

Link between Jobs Where There Is a Skills Shortage and MOOCs

The research highlights that finding employment is a major incentive for taking a MOOC. Therefore, the suggestion was made that as part of the awareness campaign, the portal should highlight jobs categories where there are jobs available and where employers find it difficult to find suitable candidates. These higher-level entries could link to job descriptions within those categories, the qualifications commonly required for those jobs and links to a learning pathway leading to such qualifications. Recommended MOOCs (offered by accredited MOOC providers) that are appropriate for each step in the learning pathway could also be shown.

Final Inspiration

In the words of a workshop participant:

I think we don't need a massification of training content, [rather] we need a massification of dreams. We need to be dreamers so that people can understand the opportunities are there. There are pathways that we can highlight for them. QUOTE

4.6.7 MOOC Learning Strategies

Will the teaching and learning strategies be compatible with the potential MOOC student's learning style? This allows the potential student to base his perception as to whether the MOOC is achievable (see Section 4.6.3) on credible information.

As one of the workshop participants explained:

> First of all my familiarity with typing and interfacing is perhaps a challenge. Secondly, do I have the language competencies to be able to listen to and take in? I need to be able to make notes and go slower and go through it again and again to be able to that. So, learning modalities of the target audience force specific modes, must allow teaching methods to have lesson types that are appropriate for that persons learning style.

Some basic information is required about the type of and extent of personal communication and interaction and whether interaction and group work are optional or mandatory. The workshop participants suggested that the students' expectations that sufficient support will be available may not have been met previously in a variety of educational contexts. Hence, the students may be particularly anxious to find out whether appropriate support is given in the unfamiliar MOOC environment. The workshop participants reflected on their experience working with students who had limited formal education or who had previously been in schools where they were passive students. The students' "learning maturity" is reflected in their ability to organise work, do group work and find information without much help from a teacher or lecturer (i.e. self-regulated learning). The importance of support to prospective MOOC students is explored in Section 4.7.

Initial information regarding MOOCs and MOOC platforms that the workshop participants proposed included:

- Does the initial information about the course have a clear structure? This embedded organisation of content helps less mature students to find relevant information and shows them how information can be structured. Ease of use of the MOOC platform assists students to achieve target behaviours in terms of making decisions to register as well as subsequently when taking the course.

- Student engagement, for example, must the student be online to participate in classes at particular times? Hence, to what extent is there self-regulated learning and does this seem to match support for learning as advertised?

- Is the course self-paced or are there strict deadlines?

- Assessment, for example, will all assignments consist of multiple-choice questions; will there be assessment by lecturers or by peers; will there be group work?

- Practical elements, for example, are there sessions which require a student to be physically present at a workshop, laboratory or for a period of work-related training or an internship?

- Support, for example, is there direct communication and interaction between tutors and groups of students, can the student email or phone a lecturer for additional explanations? Are provider services described and credible?

- Peers, for example, are there group assignments, does the MOOC platform include facilities for study groups or informal group discussions?

4.7   The Survey

4.7.1   Motivation to Enrol (Register) for MOOCs

In Section C of the questionnaire, there are six groups of questions. The first four focus on the way MOOCs and MOOC platforms facilitate the learning process:

- The FTR (MOOCs' desirable features) group of questions relate to the options that are offered by the MOOCs and MOOC platforms in terms of the learning process and resources required. There were a large number of questions in this group (12), and hence, it was analysed both as a single set (MOOC advantages) and as two subsets (Functionality and Accessibility questions in this group were analysed separately).

- The REA group of questions relate to environment, that is, social and economic factors, in particular perceptions of job requirements, associated extrinsic motivation and support from colleagues and family.

- The PER (personal preferences) group of questions relate to preferred learning style and intrinsic motivation.

- The REG group of questions look at the amount of support given and interaction between students.

The final two groups of questions are handled in other chapters. The fifth group of questions (BAR) focus on environmental barriers that need to be overcome. These are mostly related to infrastructure (see sections 3.5.2 and 7.3.1). The final group of questions focus on the preferred field of study (discussed in Section 7.3.2). This group does not ask why that topic is preferred.

4.7.2 Correlations between Constructs (Dependent Variables)

Correlations were identified using a Pearson's Correlation two-tailed test.

Only groups with a Cronbach's Alpha value that rounded up to 0.7 or was greater than 0.7 were used (see Section 2.8.3 and Table 2-6). The REA group consisted of only two questions and could not be used in correlations (the Cronbach's Alpha value was too low).

First mean values for the set of questions in each group were calculated for each respondent in order to get a single value to use in the correlations. All the groups had a 5-point Likert scale with options from Strongly disagree to Strongly agree (coded as 1 to 5) and in the case of the three groups (two subsets and the full set of questions) derived from the MOOCs' desirable features (FTR) questions Very unimportant to Very important (coded as 1 to 5). As can be seen from the descriptive statistics (Table 4-3), the overall means do not indicate that the respondents were over accommodating other than regarding accreditation where they indicated that accreditation was a very important consideration (they agreed that they would take courses provided that they were accredited – see Section 6.5.1).

Table 4-3: Descriptive statistics

	Mean	SD	N
Accreditation (ACC1 – ACC3)	3.818	.8197	3125
MOOC Functionality (FTR1 – FTR7)	2.85	.430	3125
MOOC Accessibility (FTR8 – FTR 12)	2.73	.521	3125
MOOC Advantages (FTR1 – FTR 12)	2.85	.402	3125
Interaction (REG1 – REG7)	2.81	.426	3125
Personal (PER 1 – PER7 plus REG9)	2.82	.436	3125

Table 4-4: Correlations for question groups regarding motivation to register for a MOOC

		Mean: I will take a course	MOOC Functionality	MOOC Accessibility	MOOC Advantages	Registration	Personal
Accreditation	Pearson's Correlation	1	.178**	.108**	.181**	.156**	.129**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	Sum of squares and cross-products	2099.232	195.958	143.750	186.548	170.800	143.937
	Covariance	.672	.063	.046	.060	.055	.046
MOOC Functionality	Pearson's Correlation	.178**	1	.389**	.768**	.226**	.278**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	Sum of squares and cross-products	195.958	576.964	271.938	415.120	129.417	163.034
	Covariance	.063	.185	.087	.133	.041	.052
MOOC Accessibility	Pearson's Correlation	.108**	.389**	1	.650**	.224**	.262**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	Sum of squares and cross-products	143.750	271.938	846.512	425.238	155.597	185.709
	Covariance	.046	.087	.271	.136	.050	.059
MOOC Advantages	Pearson's Correlation	.181**	.768**	.650**	1	.259**	.315**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
	Sum of squares and cross-products	186.548	415.120	425.238	506.043	138.670	173.028
	Covariance	.060	.133	.136	.162	.044	.055
Interaction	Pearson's Correlation	.156**	.226**	.224**	.259**	1	.324**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	Sum of squares and cross-products	170.800	129.417	155.597	138.670	567.708	188.544
	Covariance	.055	.041	.050	.044	.182	.060
Personal	Pearson's Correlation	.129**	.278**	.262**	.315**	.324**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	Sum of squares and cross-products	143.937	163.034	185.709	173.028	188.544	595.093
	Covariance	.046	.052	.059	.055	.060	.190

As can be seen from the set of correlations in Table 4-4, all of the groups were correlated with significance levels of 0.000. However, where there was an overlap (i.e. between the complete set of FTR questions in MOOC Advantages and the two subsets, namely, MOOC Functionality and MOOC Accessibility) the Pearson's Correlation values (highlighted with blue ellipses) were understandably very high. The correlation (highlighted with a red ellipse) between the MOOC Functionality and MOOC Accessibility subsets was also higher than in the other cases. The other Pearson's Correlation values for relationships between the mean of the questions for Accreditation (ACC1 – ACC3) and the other groups are slight (below 0.2) (Tredoux and Durrheim 2013). The relationships values between the questions labelled Registration and the other groups are in the range 2.0 to 3.0 and indicate a low correlation – there is a definite but small relationship (Tredoux and Durrheim 2013). Similarly, the relationships between the questions labelled Personal and the other groups are in the range 2.0 to 4.0 and are low showing a definite but small relationship (Tredoux and Durrheim 2013).

The relationship between the questions labelled Personal and the MOOC advantages and the relationship between the questions labelled Personal and the Registration group are higher (in the range 3.0 to 4.0) but are still considered to be low.

These results are not really very informative and future analysis is needed to derive additional information and it might also be necessary to supplement these with further research is needed.

4.8   What Strategies Will Best Motivate MOOC Students to Register for a MOOC?

4.8.1   The Survey

Firstly, the analysis regarding the three questions in Section B of the questionnaire confirmed the importance of recognition but a reputable South African authority for MOOCs. This will also increase the chance that an employer will recognise the completion of an accredited MOOC and that this will be taken into account for promotion purposes. The topic of accreditation is discussed in detail in Chapter 6.

The question (REG0) on previous registration for a short online course was analysed thoroughly against demographic variables and this sheds light on who currently registers for these courses. All the factors considered showed that certain groups need more encouragement than others. These are discussed in detail in sections 3.5.1 and 5.9.

Useful information may be obtained regarding the barriers to studying, but it is proposed that these issues are already quite well known and are receiving attention. There is some discussion on this in MOOCs (see Section 7.3.1). The information about popular fields of study may be worthy of additional attention (see Section 7.3.2).

An analysis was done to see if there were correlations between the groups of questions in Section C of the questionnaire with a second Pearson's Correlation test done for the groups of questions in Section D of the questionnaire. These correlations (together with the Cronbach's Alpha tests) suggested that the conceptual framework proposed in Figure 2-3 did indeed consist of coherent individual constructs that were independent of one another. This conceptual framework does therefore have the potential to be the basis of further research which may in turn provide valuable practical insights as well as contributing to the theory of the adoption and use of MOOCs.

4.9   Conclusion

It has been established in Chapter 3 as well as in this chapter, that the MOOCs required as well as the amount of support provided are likely to differ widely for different sectors of the population although it was an often voiced opinion in the workshops that life-long learning and access to up to date, well designed courses is important for all citizens. However, it was also clear that many people would resist changing the way in which they learn and others are not keen to learn new skills as they do not like change and do not want to change their current work content or routines.

The main question, regarding the strategies required, was not answered explicitly by the survey beyond the aspect of accreditation and previous experience (registration). The data exists from this current project that will allow researchers to do a detailed analysis, but this will be at a fine level of detail per question (and there are many questions). In addition, the answers to these questions may depend on the various the demographic variables. Hence, the basic suggestions in Section 6 are more appropriate for informing policy development than any obtained from the survey - the primary recommendations from this chapter comes from the workshops.

Recommendation 1: Increase awareness of MOOCs and MOOC-like courses in all communities. Campaigns providing introductory information about the advantages of MOOCs and the ways of accessing them need to be launched using traditional mass media. This recommendation corresponds to blocks 1a, 1b and 2 in Figure 4-2 as it encourages the citizen to consider looking for a MOOC that will equip him or her to obtain new and useful knowledge and skills.

Recommendation 2: Develop a structured information repository (probably as a portal) where increasingly detailed information can be found. This needs to make it easy to identify the MOOC options available; This centralised resource should allow the interested person to explore the site and compare different platforms and courses, offered in different ways, and meeting the needs of different groups of students This

recommendation enables the citizen through the structured process (see blocks 4 to 7 in Figure 4-2) leading to a decision whether to register for a MOOC.

Recommendation 3: The portal could provide easy to use, online way of assessing fit between the student's requirements and the listed MOOCs. This might be in the form of filters to present a short list of suitable courses as well as a check list that the potential student could use to rank the recommended courses. Alternatively, the portal managers might ensure that the preview material supplementing the list of recommended MOOCs provides at sufficient amount of information. It may also be an option to have a one week trial registration as most MOOCs globally see an immediate reduction in active MOOC students and it may be worth discussing whether these should be included in the statistics for completion.

Recommendation 4: The research highlights that finding employment is a major incentive for taking a MOOC. It was suggested that the portal should highlight jobs categories where there are jobs available and where employers find it difficult to find suitable candidates.

Chapter 5: Motivation to Complete a MOOC

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5.1 Introduction

5.1.1 Research Question

The over-arching research question was: How can the uptake of MOOCs in South Africa be increased, and how can MOOC qualifications receive mutual recognition at other HEIs?

The research question explored in this chapter is: What would encourage potential MOOC students to complete a MOOC?
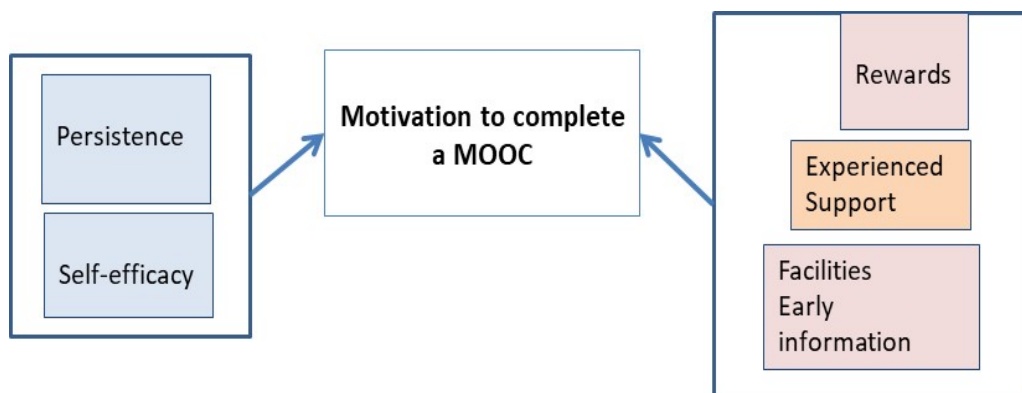
Figure 5-1: The MUM concepts related to motivation to complete

As in Chapter 4, perception of MOOC-student fit forms the basis for the student's decision whether to persist to the point of completing the MOOC. The portion of the proposed MUM (see Figure 2-2 and Figure 2-3) applying to this question is shown in Figure 5-1. Hence, the expectation is that personal factors (persistence as a personality trait and self-efficacy) will play a role in the students' choice whether to complete the MOOC, as will factors relating to the environment (rewards, facilities available, and early information). Interpersonal factors (experienced support) are also expected to play a role when the student decides whether to withdraw from the course or to complete it. In this section of the proposed model, the direct role of technology has been downplayed. The authors must continue guard against techno-romanticism and the

belief that the fast evolving technologies can automatically solve the problems of unequal access to education across the world (Prinsloo 2016; Rudd 2014 cited in Czerniewicz and Rother 2018).

5.2   Literature Review

5.2.1   Completion Rates

It is generally accepted that the average completion rate as measured by the institutions offering the MOOC is low. Reich and Ruipérez-Valiente (2019) analysed data from all MOOCs taught on edX by its founding partners MIT and Harvard University. This recent and prestigious article reports on a large set of data (a combined 12.67 million course registrations from 5.63 million students) and gives completion rates of between 6% and 10% per year over the period 2012 to 2018. These authors note that "MOOCs' low completion rate has barely budged … despite 6 years of investment in course development and learning research" (Reich and Ruipérez-Valiente 2019, 130).

They also point out a low percentage of students who completed a course and then registered for a new course the following year and a steeply declining number of those who registered for a second year who completed it.

This situation may be aggravated in South Africa as the completion rate for different groups of students in higher education varies widely, "white South African completion rates are on average 50% higher than black African ones (Council on Higher Education 2013)" (Czerniewicz and Rother 2018, 27).

5.2.2   Measures of Retention and Satisfaction Derived from Surveys

The findings reported from the literature in this section contrast with those of other authors (e.g. Henderikx, Kreijns and Kalz 2017a; Loizzo and Ertmer 2016), who argue that the success of a MOOC should not be measured by comparing registrations and completion figures alone as a high percentage of students indicate that they were satisfied with the course. Henderikx, Kreijns and Kalz (2017a) give completion figures for two MOOCs as 6.5% and 5.6% but self-reported satisfaction levels for the same two courses as 59% and 70%.

Therefore, care must be taken not to directly compare the institutional registration and completion percentages with results from a user survey. Totally different measuring instruments are used and different things are being measured. The results should be seen as being complementary and neither is a full picture of the success of the MOOC or MOOCs in general. An example of this apparent contradiction is found between the findings of Garrido, Koepke and Anderson (2016) in their report based on the survey section of their mixed methods research and the generally accepted percentage of MOOC students who complete the course.

Garrido, Koepke and Anderson (2016, 2) claim that: "The key findings of this study challenge commonly held beliefs about MOOC usage in developing countries, in defying typical characterisations of how people in resource constrained settings use technology for learning and employment." For example, the findings from the data indicate that: "Low- and middle-income populations make up 80% of MOOC users, in contrast to wealthier populations reported elsewhere" (Garrido, Koepke and Anderson 2016, 8).

Garrido, Koepke and Anderson (2016, 8) further claim that: "Forty-nine percent of MOOC users received certification in a MOOC class, and another 30% completed a course. This is far above the single-digit rates reported elsewhere." Partly supporting this claim, Boga and McGreal (2014, 4) cite Regalado (2012, para. 7) in a statement that, "MOOC purveyors have found that 60% of their sign-ups are self-starters from knowledge-hungry nations like Brazil and China."

However, again it is the opinion of the authors of the book that direct comparisons are unwise as, on the one hand, the findings rely on self-reported data with no supporting evidence of which MOOC was completed, when, or even whether the respondent understands what a MOOC is. The institutional figures, on the other hand, are global and may not reflect the reality in the three nations reported on by Garrido, Koepke and Anderson (2016).

5.2.3   Interpersonal Interaction

As predicted by the MUM, interpersonal factors are prominent in the literature on MOOC completion. Because of the massive number of students, it is simply not feasible for each MOOC to have a tutor who interacts with students individually. This makes MOOCs different from online academic training (Fidalgo-Blanco, Sein-Echaluce and García-Peñalvo 2016; Nkuyubwatsi 2013). The absence of a personal tutor, however, may be only one factor that may impact on low completion rates. However, authors from developing countries caution policy makers that low completion rates are due to various challenges that are related to lack of student support, namely: isolation (Castillo and Wagner 2015; Henderikx, Kreijns and Kalz 2018; Khalil and Ebner 2014); little individual attention (Liyanagunawardena, Williams and Adams 2014); lack of institutional initiatives to provide support (Colucci, Muñoz and Devaux 2017); and lack of moderators in the MOOC-c forums (see below) (Mackness, Mak and Williams 2010). The need for mentoring is included in the United Nations Educational, Scientific and Cultural Organization (UNESCO 2016) guide for policy makers as part of the recommended additional services offered by a MOOC ecosystem. The need for career pathways, the necessary professional development and forms of further assistance for a range of facilitators, tutors and lecturers who will provide this student support must be recognised (Prinsloo 2016).

5.2.4 Hybrid MOOC Models

As illustrated in Figure 5-2, there are two hybrid models (xMOOCs and cMOOCs) that use internet-based platforms together with support by tutors or other people in a teaching team. These hybrid models resemble blended learning models but are intended specifically for use with MOOCs.
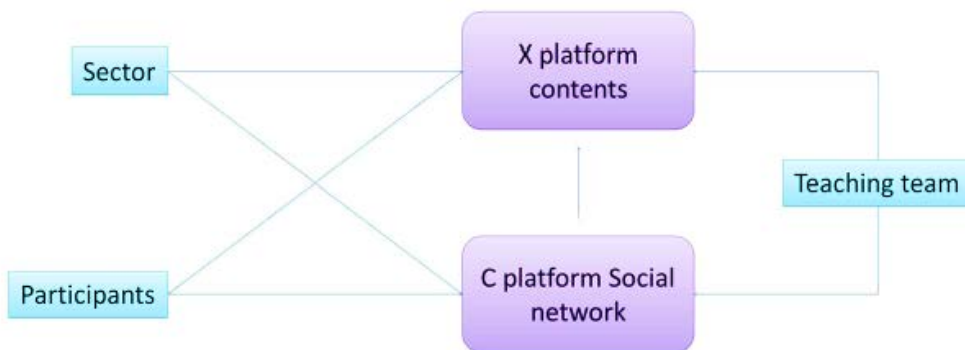
Figure 5-2: Flow of resource creation for the proposed hybrid model

Source: Fidalgo-Blanco, Sein-Echaluce and García-Peñalvo 2015

xMOOCs

xMOOCs are instructivist and individualist (i.e. they expect that the student is largely self-motivated and can work independently). Coursera and Stanford-like courses rely on a one-to-many relationship to reach massive numbers of participants with little or no participation or intervention by tutors or mentors (Liyanagunawardena, Williams and Adams 2014). These are often "synchMOOCs" that have a fixed schedule with a set start date, deadlines for assessments and deadlines for course assignments. The assessment is usually automated (e.g. multiple choice quizzes or other forms that use AI). Technologies enabling xMOOCs offer classic learning models and focus on improving the technologies rather than revising pedagogical models. Blackmon and Major (2017) refer to courses that use data analytics, algorithms and AI extensively instead of personal interaction to provide a "personalised experience", as "adaptive MOOCs".

cMOOCs

cMOOCs are based on social learning, cooperation and use of web 2.0 (Fidalgo-Blanco, Sein-Echaluce and García-Peñalvo 2016). They are aligned with "the theory of Connectivism, proposed by George Siemens as a new learning theory for a digital age"

(Mackness, Mak and Williams 2010, 266). These MOOCs may allow students to register at any time, but this appears to reduce the degree of activity in the forum as a small cohort of students are busy with the same material at one time (Mackness, Mak and Williams 2010; Shah 2016). Technologies based on social software, such as social networks, enable the new ways of learning used by cMOOCs which use multiple learning spaces, tools and technologies (Liyanagunawardena, Williams and Adams 2014). However, these authors point out that the variety of learning spaces increases the need to become familiar with them all or to select only one or two. The need to master complex platforms and MOOC models can demotivate MOOC students.

Social networks have directed our attention to informal learning, outside the institution or classroom. The learning theory embraced in this pedagogical model is that a learning community and learning culture that support and encourage members of that community while also learning with and from one another (Fidalgo-Blanco, Sein-Echaluce and García-Peñalvo 2016; Loizzo and Ertmer 2016). Loizzo and Ertmer (2016) suggest that use of cMOOCs leads to critical consumers of education; encourages a positive social media mentality using strategies such as voting and the need to protect and enhance reputation; promotes the idea that even not-active (lurking) visitors to the forum can be learning; it reinforces student independence where instructor engagement is nice but not expected; and reveals the power of peer review. However, the number of posts to active forums can be overwhelming. This can become a particular problem for less mature students who may believe they need to read everything or are not very fluent in the language, and hence, are slow readers (Liyanagunawardena, Williams and Adams 2014).

5.2.5 Other Forms of Support

There are various ways in which students can be supported before they decide whether to register for a MOOC and which MOOC they should register for. Brunton et al. (2017, 10) propose a pre-induction socialisation MOOC:

> The MOOC targets prospective students during early parts of the study life-cycle, when they are considering entry into higher education and may benefit from advice about how to effectively prepare. The MOOC utilises a number of the OERs developed by the Student Success Toolbox Project and combines these readiness tools with supporting to deliver a comprehensive pre-induction socialisation course.

Xu et al. (2018) recognise the need for comprehensive, multidimensional support for underprepared students. This includes creating learning communities as in the cMOOC model, but these may be collocated (live reasonably close to one another).

Insufficient pre-registration skills, preparation and information about course contents and course requirements can lead to large dropout rates (Khalil and Ebner, 2014). Hence, preparatory courses, which could also be ancillary MOOCs, can be used to assist students before they register. Liyanagunawardena, Williams and Adams (2014) refer to

a "MOOC Survival Course". Examples of such courses are given by Brunton et al. (2017) and Xu et al. (2018).

The various forms of pre-registration support, which need to be easy to locate on a portal, can increase the motivation to register for a course. However, having completed preparatory courses and having a clear idea of course objectives, schedule, pre-requisite knowledge, cost, will increase the probability that the student will also be able to complete the MOOC successfully.

The literature highlights the need for addition forms of ongoing assistance for displaced persons, and communities who may not live in a context where there is a learning culture or support or resources to facilitate learning by means of MOOCs (Colucci, Muñoz and Devaux 2017).

Websites like ClassCentral.com contain a lot of supplementary information for people who are looking at registering for a MOOC. Beyond having catalogues of MOOCs, they offer "personalised" recommendations.

5.3   The Workshops

The following sections identify why students may not complete MOOCs and – sometimes explicitly and other times by implication – what needs to be added to a MOOC ecosystem. This section is based on transcripts of the face-to-face discussions from both workshops. Hence, these challenges and recommendations for addressing them refer to the South African context which is seen as being different from that in high income countries. Several of the challenges that may arise while a MOOC student is studying have been foreseen in Chapter 4 and will also have been discussed in the section on the Awareness campaign (see Section 4.6.1).

Three reasons were offered for a high dropout rate in MOOC courses: firstly, the course did not meet the students' expectations, and hence, was not considered to be of value; secondly, the students doubted their ability to pass the course and became discouraged; and thirdly, was the expected support provided and was it sufficient. But contrasting views also arose. Before discussing the separate reasons, the group discussed student maturity (how well-prepared are potential MOOC students from the full spectrum of South African citizens). This is followed by a discussion on meeting student expectations and the perceived value of a MOOC and self-efficacy (see Section 5.4). These are also regarded as personal factors, whereas support, including assessment, is an interpersonal issue and is handled separately.

5.4   Personal Factors

5.4.1   Student Preparedness

Student preparedness or student maturity is an important personal factor although not explicitly shown in the MUM (Figure 5-1). However, this 'maturity' or ability to take maximum advantage from MOOCs is shaped by contextual factors as pointed out in the analytical framework proposed by Czerniewicz and Rother (2018).

The first quotation is from an educator:

> My challenge with the idea of MOOCS is that the threshold for entry is a mature learner, a person who can self-manage, a person who can plan their own time, a person who can direct their own goals, and a person who can measure their own performance and who can seek resources et cetera. So, I think when we talk about MOOCS, the comment about career professionals using MOOCS makes absolute sense because those people are self-driven and self-managed and have learning competences. But if we talk about MOOCS in the context of the broad population, they have probably been through inferior educational processes and they come out not yet ready to be self-driven learners. It brings with it a whole lot of challenges in terms of interaction, direct teaching, and actual individual feedback, etc.

The next quotation reflects the experience of a student who was expected to adapt to the new and unfamiliar learning environment and who had to learn some of the learning skills mentioned by the first speaker:

> We had a group platform, but at first I did not know what I was supposed to do. I didn't use the platform to seek solutions from others. I worked on my own until I found out for myself. Sometimes we just do not feel comfortable asking – maybe because we feel stupid.

The third comment was offered by a lecturer who highlighted the expectations that an "immature" student, who is not accustomed to having to discover information, might have. When they are met, it might make the student angry and resentful, because "I want the answer, I want it now and I want to be rewarded now."

The final comment highlights different priorities which the speaker related to youth: "She mentioned a key point where people do not want to spend money on data on other things except social media."

Student maturity may affect value perception and self-efficacy.

5.4.2   Self-Efficacy

The MUM identifies self-efficacy as a personal factor. According to the workshop participants, the second reason for abandoning a MOOC is a loss of confidence. There

may be a discrepancy between how good the students thought they were in the chosen subject and how good they really are. This may explain why the people who are successful in completing MOOCs are mostly graduates with degrees; they have experience in post-school education and know what is expected of them. Therefore, their estimates of their ability and how difficult the course will be might be more realistic than those of people who either studied a long time ago or who studied under completely different circumstances:

> Students sometimes lose faith in their ability to complete [a course] because they lack competence.

> Maybe I thought it was going to be easier but it's not. I thought there will be support, but there is no support, etc.

> If someone enrols for a programme and they see that they are not a getting high score they ask themselves if it is worth it. The moment that students get high grades their motivation and enthusiasm increase and they are more likely to continue than when they are struggling.

The proposed way of addressing this problem was to give students an opportunity to do an assessment check before registering for a MOOC to see whether the level of difficulty was appropriate, that is, provide: "supplementary guidance as a precursor to enrolling to check your ability to want to participate".

5.4.4 Value Perception

Value perception is related to the component of the MUM labelled as "rewards": What is in it for me? As was noted in Chapter 4, The FBM (Fogg 2003; 2009) aligns motivation very closely with the expectation of benefits. The student is, therefore, expected rapidly lose interest in the course after enrolling for it if it is does not match his interests or requirements and the effort required is considered to have no purpose: "I leave because my sense of value is not there. This might be because I had higher expectations of the course than I am finding in reality."

The rewards are shown in the MUM as external (environmental). However, this is not a true reflection since motivation can be extrinsic or intrinsic. By the time the student has started working on a MOOC, the authors are assuming that the expectation of value has largely been assimilated – there has been buy-in by the student at least initially and the value proposition has become personal. Hence, although this topic is included as a personal factor it is also related to external factors.

Other external factors are closely associated with this value perception aspect of MOOC-student fit. Before registering the student might have had insufficient information about the course to judge whether it was really what he wanted. Hence, only after starting the MOOC would he realise that the benefit expected would not be

obtained. This is shown in the MUM with early information coming from the environment:

> This means that there is a system problem. There wasn't enough executive summary of the course that could have assisted the learner to choose the right course right from the beginning.

It is the environmental factors that the people conceptualising a MOOC ecosystem can influence and that the MOOC designers, managers, developers, and operational staff need to monitor constantly.

Prior to choosing a MOOC, career guidance might be required to assist the student to choose a MOOC that matches his personal interests as well as a career. Even in "traditional" universities, students often change their minds about what they want to study, and in that environment this is usually because the students are heavily influenced by their parents, teachers and peers but do not have enough insight into their own interests or do not have enough information about what the course entails. Hence, they cannot decide early on whether this course is "a good personal fit". However, the situation at traditional universities does differ fundamentally from a MOOC as a university degree involves a much longer period of study than a MOOC, and hence, requires considerably more commitment and perseverance.

A contrasting view is that students may withdraw from a course because their expectations were satisfied in the first part of the course and they saw no further value in completing it. These students were possibly self-motivated and did not need to complete the course in order to satisfy the expectations of an employer or someone funding their studies:

> There may be also a further reason why people do not finish, and that is because they are already happy with what they have learnt so far in the MOOC. In this case it might be important in our context to look how to chunk [sic] the skills and spread them out for learner to see value in completing the whole course.

5.4.4   What Content?

There is a great deal of content already available, but concerns have been raised about its suitability. The topic of accreditation of MOOCs has a chapter dedicated to it (Chapter 6). This subsection looks particularly at providing content that fits the students' needs and expectations as a misfit will cause the students to lose interest. This is part of the perceived value of the MOOC.

Relevant skills enhance people's employability. Many international MOOC platforms already highlight the relationship between a specific MOOC or series of MOOCs and a particular career. The workshop participants were keen that MOOCs whose content

helps to impart knowledge and skills that are scarce be highlighted and receive precedence for inclusion on the SA MOOC portal.

It has been noted that different communities may have particular interests; identifying these and creating content if there is nothing available, or customising OER content, can improve the perceived value of the MOOC: "The creation of content with the community that you are working with, the people that you are targeting – that is what is important."

But a huge variety of courses was said to be unimportant and a warning was also added about customising content (even though it was seen as adding flexibility): "A short comment on that the challenge is flexibility is obviously the most important but simultaneously it's the most difficult one."

The issue of MOOC content required for upskilling or re-skilling employees also noted that the first question was "What MOOCs are needed?" There was an exchange of ideas as to whether the industry councils and individual employer organisations know what they need now and whether they can prepare their employees for future changes in their work:

> I hear the comments that industries know what skills they need. We're in an environment now where business transformation is taking place at such a pace. The regulators are trying to regulate ... The education is trying to provide skills while they themselves are being disrupted. The same goes for business, so we must just be careful to always think that the industry has got all the solutions that they do not.

A detailed discussion into the 4IR; what new skills are needed; and where, when and how education must respond is clearly relevant to the topic of MOOCs but a lengthy exploration of the topic has not been included in the book. The workshop participants were aware of the challenges associated with the 4IR and that MOOCs are needed to prepare employees for new jobs. The World Economic Forum report was recommended for guidance. Fast response to changing needs, in the form of new curricula and course content, is needed throughout the educational system.

One comment that applies to content creation was,

> original new content creation must be very specific. It must be very niche market, that is, it only addresses what it wants to address, what is already identified by the market. Otherwise we are reinventing the wheel to think, for example, that the MOOC should address all of those stuff – that's not going to happen because it's just not feasible.

5.5   External Factors

5.5.1   Unforeseen Changes in Circumstances

External circumstances cannot be ignored as the MUM indicates. Alternative reasons for withdrawing from a MOOC were offered relating to external forces influencing the decision to enrol or the feasibility of completing the course.

Some students might be experience social or economic pressures to take a particular MOOC (extrinsic motivation by family, friends or employers) but these are not sufficiently important to the student to become intrinsic and sustained.

An example of resulting in a lack of commitment by the student was explained as a combination of "enrolling is easy", but "completing is hard":

> You will see a lot of the people that have dropped out of studying online MOOCS are studying for free. Education is still seen as a fashionable thing; you link it to someone that you know who has become something. Other [learners] also want to become educated or get a job opportunity. So, something like that will make you much better in your own social space and stuff. So, you have to take that kind of motivation into consideration. Because when we say free, it requires determination and also your commitment.

Some ex-students "when we call them and ask 'why did you drop out' (mostly females) will say I got a baby, or a job, internship. Others say I was accepted at the university where I applied."

In these cases, advice before enrolling may be insufficient. The "solution" offered was to build in flexibility to allow for these cases by making courses short so that they can be completed even when something unexpected happens. The proposal seems to cater for those with short attention spans as well:

> So we cannot make it like a ten day course but maybe a one day course, and when you do it, you do it today and it is finished; rather than having to do a MOOC for three months and in that three months you get bored and you start and when you come back you are lost.

5.5.2   Competing Interests

The discussion on competing interests raises the question of why social networks are so compelling and whether lessons can be learned by MOOCs from this attraction:

> The issue of competing with other social issues is an interesting one that it is purely based on motivation, the motivation of social media is amazingly strong and persuading people that worthy stuff might not be on WhatsApp and Instagram but rather on a course is part of the big challenge.

This social aspect is picked up in the Alternative learning model.

5.5.3   Infrastructure

The need for adequate infrastructure must be acknowledged. The following comments are intended to show that this is a real concern and was raised on several occasions even though it was described as being out of the scope of the research project on which the book is based.

The concern was raised:

> If you really want MOOC to work in rural communities, put in your infrastructures. The other contradiction that I see is that they talk about the fact that these are poor people that cannot afford it. So, what is Government going to do in terms of making sure that the data costs are zeroed for education?

However, the Government representatives said that the authorities are working on the provision of affordable data and access to the internet:

> Delegate responsibilities where it belongs. The focus here I do not believe should be on infrastructure, I believe we should make an assumption here that this is being attended to. It is a real problem, but the delivery of internet connectivity is not the subject of developing a MOOC strategy.

Conflicting business interests may be behind the delays in obtaining zero-rated access to MOOCs:

> But the relative impact or the zero-rating access to a Government MOOC for people to learn skills is just noise. And I believe that ICASA and DTPS have had negotiations with the cell operators regarding zero-rating for more than a decade.

Other facilities can assist MOOC students, particularly those who are unemployed and do not have suitable study locations:

> I think on that we already have a huge infrastructure of libraries in this country and in so many communities and they are rarely visited by youngsters. And you know why? Because they are outdated in terms of how they roll out the information. It still speaks to us people who like to go to libraries, the learned, but the youngsters when they look at library its intimidating. So, using such infrastructure and converting it for online learning it might be another way. We also have schools, we also have FETS, and you know there is no need to build something from scratch because that's where the issue of accessibility can be solved.

Hidden costs (such as the cost of transport to a study location), changes in financial circumstances or just being faced with actual costs may make a student discontinue the MOOC.

5.6 Interpersonal Factors

5.6.1 Learning in Familiar Ways: What They Are Used to

Prospective MOOC students in South Africa have received their formal education in classrooms and using textbooks. This has become their normal way of learning and they might still think of it as the best way to learn even though many might be using the internet for interacting informally (possibly using social networks), as a source of information (such as news reports) or for entertainment.

One workshop participant spoke from his own experience:

> I have registered for a MOOC, a couple of MOOCs, but I haven't finished one. What … mentioned is the way we have grown up learning is completely different, and I like [the way] they are teaching … there is a very strong influence on the way we are learning … which cannot be overcome.

Another spoke as an educator, "What we have to take cognoscente of is learning modalities, in other words, how am I accustomed to learning how are you accustomed to learning. And what we have to take into account of here is history."

5.6.2 Support

As noted in Section 5.4.1, many South African students have not had the opportunity to become self-regulated students. If students whose confidence in their ability to successfully complete a MOOC become disappointed in the amount of assistant provided, the risk increases that they will lose hope that they can obtain the qualifications they aspire to. This in turn may cause them to abandon the course.

Relating this to the FBM (see Section 4.5.1), of the three principle factors that must be present concurrently for a target behaviour to occur, the perception of the ability to perform the behaviour is lost even though the expectation of benefits) and a trigger to perform the behaviour are present (Fogg 1999; 2009).

Interaction with Other Students

There was strong support for the idea that interaction encourages learning: "Learner engagement is one factor that has been proven to be one of the contributing factors to the completion and graduation of learners."

The proposed way of addressing the resistance to change noted above was to offer both learning by yourself using a MOOC and some group work.

Several speakers agreed with the idea of online groups meeting at the same time (i.e. "synchMOOCs" as described in Section 5.2.4) as a way of retaining flexibility but

including interactivity: "Another way is to put up a discussion forum where learners can come together and help each other through issues. Sometimes learners learn better from their peers in groups."

A description of how one programme in South Africa addresses student support indicated that it involved facilitators, mentors and peer reviews, but it was not clear whether it was online – it seemed to be a local group: "You might get feedback, through a peer-review on our MOOCs workshops. We employ the facilitators, and mentors to look at and facilitate the courses. There is no direct teaching, and that is very important to understand."

Another speaker used terminology often associated with cMOOCs, "a learning community and the idea of creating a learning hub", which is not necessarily synchronised but is an online discussion and is therefore flexible. Flexibility was linked with interactivity by another person who then noted that interactivity is motivating: "It is important to design an effective and flexible study path. Because I cannot come to an online platform that is boring, I want it to be interactive and to talk to me."

The contributions, however, may not be what was expected: "Learners are very happy to share information for couple of hours. You will have a learner who is using the online platform and then the next thing you know all the multiple-choice question answers are available on WhatsApp."

It is not only students who have never taken a MOOC before that need to be motivated, A learning community can develop from people who have previously completed MOOCs and can be supported by a learning hub: "I did a course through MIT on EdX probably two years ago. I still am getting updated suggestions on related content pointers to the discussions or articles of interest and they have created a learning a hub."

Facilitators

One speaker had this to say:

> There have been lots of strategies in South Africa as well as overseas into the research based on MOOCs. MOOCs are wrapped by the organisations, NGOs, etc. so that a local group is set out to help learners to go through and work through the MOOCs and there is no direct teaching, it is more like facilitation and this has been the same method used globally as well.

The same speaker referred to international experience as well:

> In our research we found that people in Africa who have been taking MOOCs tend to be career professionals already. It is very difficult for people who are school leavers or who really have no basic education to actually get to all those things we discussed, like digital literacy, connectivity, etc. So … you have to be very careful that the MOOCS are working well for people who do not have considerable resources and education.

New Jobs

Providing appropriate support at the time and place required is particularly difficult if there are many students. There were several suggestions, some of which emphasise the advantages of training and deploying suitable people in the same organisation or community as the student. This can provide new job opportunities in communities where work is scarce or there might be a voluntary mentor, a person who has recently completed the MOOC.

One suggestion for meeting the scalability problem is to:

> Train the trainer model so that it can be used to train those people who go out to become facilitators so that the [students] copy the skills from their trainers and go on to pass the skills on to other people.

> So we should not be training a bunch of people to do that and send them out, we should be running a programme to take the people who are already out there and train them on how to bring in their contribution.

New jobs are not limited to facilitation of group discussions, however:

> I see this is where new jobs actually need to be created: in the collaboration space the content creation space … We are consistently thinking people are losing their jobs but now we need to go entirely to a new way of thinking We don't have enough resources for all that we want to create, all this language content, creating activity [and] we don't have enough skills for that. I think that is where the real opportunities [lie].

5.6.3   Assessment

Contrasting views were evident regarding assessment, for example, a participant offered a definition of a course that differentiates it from a You Tube video: "A course implies that there are predefined outcomes which means there needs to be some form of assessment."

Another participant gave a personal view about the advantages of teamwork and feedback in relation to assessment:

> I felt I belonged to my team while I was doing it, and I felt like they were noticing the assignment submissions. It was really clever. And it was like we are at school and once in every two weeks during a live webcast we would refer to one assignment.

On the other hand, there was the view that may relate to the self-efficacy of students or may relate to the self-motivated group who are doing the course purely for interest in the topic or to "'try out" a MOOC to experience this learning modality. These views contrast with what was said above, and this difference of requirements supports the position that a single solution will not fit the needs of all: "We have interviewed 60

people and it's growing, people who have taken and completed this in other countries. So, we've got data on the practices and what they want, but generally they don't need the assessment."

The suggestion that technological functionality can be incorporated into support should be noted: "I think the platform should be designed to monitor progress so that as soon as a problem start to develop then the learner will be engaged and guided."

Lessons can be learned from motivation used other applications of technology, such as gamification and a very visible reward system. Hence, although assessment is presented as an interpersonal factor, and technology was not reflected in the section of the MUM related to student retention and continuance issues, technology is obviously part of the MOOC ecosystem and should be leveraged where it makes sense to do so (where it can add value – quicker, more consistent – and reduce costs).

A student who has spent time playing games on his or her mobile phone may be retained if there is an element of competition in the assessments. This can take several forms and is associated with theories of motivation and with persuasive technology: "But the question is how we make use of emerging technologies in the learning environment and the education sector."

5.7   Implementation

In Section 5.4.3 the authors state that, "It is the environmental factors that the people conceptualising a MOOC ecosystem can influence and the MOOC designers, managers, developers, and operational staff need to constantly monitor."

The MOOC ecosystem (the technology and interpersonal support services) becomes part of the learning environment and technology and related services are imported into the MOOC ecosystem. These recommendations look not only at how the environmental factors can be altered, but also how imported environmental factors can be used to best advantage. What should be imported from elsewhere, to what extent should what is imported be amended, and must there be innovation?

5.7.1   Can Researchers Learn from Elsewhere?

One of the most basic questions is, "Is the plan here to design or to use what is already out there?" Thus, we need to look at existing international products and follow the research on them, but the transcripts of the workshops indicate that the local context must be taken into account. Hence, taking full advantage of what is already in place and learning the lessons that international researchers have made available is necessary. However, local "add-on" in terms of complementary programmes and adjustments to existing MOOCs were recommended. In other words, the technology is available, and we can leave the enhancement of that technology to other large organisations. Researchers need to look at the MOOC-fit for the environment and the personal

strengths and weaknesses of South African citizens. The way of adjusting the international MOOC offerings to the South African needs is by adding interpersonal structures that boost the ability of individual students to succeed using the MOOC technology and learning modalities.

There was evidence of this from several quotations:

> One needs to go look at the Harvard programmes and see how they teach up to 150 000 learners at a time. How they have developed efficient teams and group platforms around the world. There are numerous examples of how this can be done … Our biggest challenge is getting people ready for the MOOC so that they understand the value etc. The mechanics of making MOOCs work is already there although it is far from being perfect.

> But in our context, I think we really should take a step back and recognise that this is not Boston or Silicon Valley.

> We also understand that MOOCs are out there, they are working, and they can scale. So, if we've already got the technology proven it's a case of learning from the market … and putting the infrastructure for a MOOC platform in place. So, the focus here is not necessarily even on the platform itself, it's on the functionality of the platform and the focus of the platform in terms of who is utilising it. The model to a certain degree to works in some other spaces, that's why I think it has inspired the wish to best go on a roll out … [before we can go on a national stage, we still need more and more to make sure that we run a very efficient and effective system], but there are already some processes that are currently taking place.

5.7.2 Artificial Intelligence

Section 6.3 (Assessment) mentions the role that technology can play in addressing the scalability issue (the difficulty of assessing the work of a massive number of students). This section elaborates on that discussion by referring specifically to artificial intelligence (AI). While many benefits were identified, some words of warning were offered, including issues of privacy when AI is linked to the use of big data and data analytics:

> AI is reliant on the quality of the data provided. If you cannot have quality data, then your intelligence will be absolute rubbish. I want to say, first things first, make sure that people are giving quality information. I would almost want to caution against the use of things such as algorithms unless you are doing it the right way. Rather be very careful.

When we talk about scale, then a concept like AI becomes relevant. When we are not dealing with scale, is AI required? Not necessarily, because we might not have sufficient data to work with.

There were different opinions as to the extent of AI needed: "I would like to say that we are not yet there in an era where artificial super intelligence systems will be used."

Do learning management systems use low level AI or are they just management information systems that humans use in making decisions?

> If we are suggesting that AI is making certain decisions based on whatever past information we had, then we already had AI. It already existed in our basic learning management systems where we set up conditions, notification systems, workflow decision points, branching within courses based on progression and outcomes. We must not be distracted by the silver bullet and these fancy words that get tossed up.

5.7.3   Design

There was an emphasis on the importance of deliberately designing the ecosystem and not leaving it as it currently is, namely, a set of ad hoc fixes and separate programmes providing the support needed to MOOC l students in South Africa. A well-informed design of the ecosystem (based on discussions such as those reported on in the book but also on published research articles and research reports) is needed. Hence, discussions are required to answer the question, "What do we need to add to MOOC platforms?"

Although one speaker identified value perception, self-efficacy and support as the three drivers that act together, he was very clear that the design of the ecosystem needs to reflect the agenda (the intentions of the "owner" of the system), and hence, to make it clear to potential users what they could gain and what support they could expect from the system.

He went on to say:

> So, it is design and that is why it is costly to develop a MOOC, you do not want to get design wrong. The point I am making is that for us to get a better success story in terms of motivation rather than a failure rate is to incorporate these components in the MOOCs to ensure that these non-completion rates are reduced.

This means that "the owner" of the system needs to have a clear idea of what the system must achieve, how this will be measured, and the cost of the system.

5.7.4   Hybrid

One of the design decisions (possibly the most fundamental one) is related to the learning model and the forms of support built into it.

Although the one speaker above said the previous learning norms cannot be overcome, others though that the hybrid model was working and offers various advantages.

This speaker suggested that the group discussion features on a student management system were a form of hybrid learning model although these are not necessarily either cMOOC or xMOOC models and can be blended (that is, include classroom and online learning), "A hybrid learning model whereby after the face to face there will still be opportunities for learners to go on the learner management system and attend a quiz, group discussion or engage with the lecturer."

Another speaker indicated that just being able to download material and use it off-line some of the time was a step in this direction:

> I just want to add on the issue of the hybrid, online and offline platforms. These are designed to utilise the device memory so that the data usage is reduced which is something very important in the context of South Africa. I am not talking about having some stuff completely offline.

The hybrid and blended learning models offer the best of both worlds, retaining to some extent familiar way of learning but also taking advantage of the convenience and efficiency of technology.

5.7.5   Who Provides Systems Support?

Support is not limited to support for the students (this is discussed in Section 5.6.2). As these recommendations are looking primarily at designing, building and maintaining the MOOC ecosystem, the focus here is on systems support including IT support.

Training is needed for many of the operational support services relating to the proposed portal and the challenge was seen to be the scarcity of suitable skills and the resultant cost of acquiring people with those skills. Whereas some of the support needed is technical, the IT team need not all be highly skilled software developers. Hence, there needs to be a team some of whom have the communication skills to work with non-IT people: "Another challenge is that the IT people does not have the capacity to explain in layman language."

This means that new careers and associated job opportunities are developed, "building a community of people who can help manage the site".

5.7.6   Incentives

Other rewards and incentives[14] can be designed into MOOCs. Simple reminder notifications, assessment deadlines and other evidence that progress is being monitored can be built into the MOOC (Jiang et al. 2014).

5.8   Measuring MOOC Success

While the MOOC might not have met the needs of some students and they might withdraw regretfully or be disillusioned – and in a worst case scenario, angry – in the experience of the experts attending the workshop, a substantial proportion of those who did not complete the MOOC were satisfied with what they had learned:

> What we found with the MOOC research that we're doing here and globally is that people will use MOOCs to get what they want while doing maybe one or two weeks' work, that's sufficient for them.

> So, you're going to promote metrics like what is the throughput in the course, what is the drop-down rate of the course. We see 85 to 90 percent of people pull out of MOOCs. They might be getting what they want from it. They are not pulling out of it, they got what they wanted ... It just changes how you think about, "What is the MOOCs' success?"

The representatives from a unit presenting MOOCs, who also do research, are aware that these simple statistics can be misleading, and hence, they carry out many interviews trying to find out the reasons for students not completing the MOOC.

As noted above, changed life circumstances were often the reason. This means that using only the numbers of people who start a course and those who complete it, creating a MOOC success rate ratio, is likely to be misleading. There may not be a need for any corrective action to assist the "external circumstances" group and the "I got what I wanted" group. However, offering smaller chunks of content with a correspondingly shorter completion time, but in a series of MOOCs that form a coherent whole, allows more exit and entry points, and hence, greater flexibility and a better chance of MOOC fit with personal requirements. Thus, developing a learning pathway creates a feasible way of increasing satisfaction on the part of the student and the start and finish statistics for each component of the pathway will reflect student satisfaction. This improvement in completion rates will be a more accurate reflection of the value of the MOOC which should please the funders and managers of the MOOC platform.

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[14] The other side of the incentives "coin" is discipline. This is one of the defining characteristics of a mature student (see Personal in Addendum C).

However, as noted by the following quotation, following up on students and finding out what they need is important:

> We can actually ask them how we can keep them because we become like Government, with all due respect, we designed these fantastic things and then we think this is going to work. When we roll it out it doesn't work … we have recently started on a monitoring and evaluation process with the University of Western Cape. They have been running the online learning for the last five years … what I did the previous year is I took two focus groups. One from the general community because you are quite right, most of the time we think we understand what the people's struggles are and we tend to evaluate these things seating in front of the desktop.

5.9 The Survey: Findings and Discussion

Correlations between previous experience of online learning and other demographics and variables. Addendum H gives the statistical evidence upon which these findings are based.

5.9.1 Province

As noted in Chapter 3, previous registrations for online short courses are currently highest in Gauteng and lowest in Northern Cape, Eastern Cape and Western Cape. The reasons for this are unclear and this would be an interesting and relevant line for future research. Previously completed online short courses are also highest in Gauteng and lowest in Northern Cape and Western Cape. Hence, future research should also look for a correlation between these two.

5.9.2 Gender

As is the case for gender and post-primary education, there is no significant difference between genders in terms of online short course registration reported for females and males. It seems that in South Africa females and males already have equal opportunities to access *all* levels of education and online courses.

Interestingly, there is also *no* significant difference between gender and reported completion of online short courses. In other words, approximately the same numbers of females and males completed the courses. Further research might confirm this.

5.9.3 Racial Groups

Previous registrations for online short courses are highest in the White racial group (41.4% of respondents in this group said they had registered for such a course) and low (between 25.8% for the Coloured group and 31.3% for the Black group) in all other groups. This is a significant difference, and a similar result is obtained regarding completion of online short courses.

5.9.4 Age

In terms of age, registrations were spread fairly evenly in the 21 to 30, 41 to 50 and 51 to 60 groups at between 31.3% and 32.6%. The reported significant difference is due to the increase to 37.8% reported in the 31 to 40 group. There was low interest in the youngest group. In contrast, the 31 to 40 and 41 to 50 groups were most likely to complete the courses they had registered for.

5.9.5 Highest Level of Education

Based on reported previous registrations, it seems that those currently studying for a university degree (at Bachelor's level or postgraduate) or who are currently studying but already have a university degree, are most likely to register for an online short course.

Similar to registrations, based on reported previous completion, it seems that those currently studying (for a university degree or who already have a degree) are most likely to complete an online short course. This finding agrees with the literature that claims that MOOC courses are most often taken by people who already have a tertiary education.

5.9.6 Currently Studying

Slightly less than a third of those studying full time claim to have registered at some time (not necessarily while simultaneously studying elsewhere) for a short online course. Also, exactly 50% of those studying part time claim to have registered at some time (not necessarily while simultaneously studying elsewhere). About a quarter of those who are currently not studying claim to have registered at some.

These results are interesting. About 16% of those studying Full time claim to have *completed* a short online course (CPL Mean score of 0.7 or 1.0) at some time compared to the 32.7% who say they *registered*. About 27.5% of those studying Part time claim they *completed* a short online course compared to the 50.1% who say they registered. About 15% of those who are currently Not studying claim to have registered at some time. Compare this with the 31.8% who say they completed a course. Hence, the persistence rates for these three groups are: Full time students' completion rate is 49.2%; Part time students' completion rate is 54.8%; and Not studying students' completion rate is 57.7%.

Of those who registered at some time for a short online course, a large number of public places are used often (selected by more than 30% of respondents who have registered) to access the internet. These public places are: School/University or NEMISA CoLab 32.8%; Free Wi-Fi zones including a public library 34.8% and Telecentre/Community centre (43.6%). Note that the respondents were asked to select only one option. There was, however, an anomaly as 29.4% of the respondents claimed to have registered for such courses but said that they did not use the internet at all!

5.9.6 Most Frequent Internet Access

Unlike previous analyses of internet access in this report, while mobile devices are equal in popularity to the aforementioned public spaces (31.4% selected this option), they are not the overwhelming favourite choice.

Of the respondents who said that they had successfully completed short online courses, Telecentre/Community Centre (23.6%) and Workplace (21.9%) were slightly more popular options while own mobile (15.7%) and friend or relative's house (16.3%) were the least popular. This is an extremely important set of findings. Whereas internet access for entertainment or social networking and communication may be extremely popular, this set of results indicate that it may not be as useful for studying online courses.

5.10   Section D: Motivation to Complete MOOCs

In Section D of the questionnaire, there are five groups of questions. The first four focus on the way the MOOC and MOOC platform facilitate the learning process:

1. The CONT (Persistence) group of questions ask the respondent to imagine and rate his or her ability to overcome various hurdles while studying a MOOC. However, at the time that the analysis was done it was decided that only the first five questions belonged in this group. This first five questions measure intrinsic motivation and are linked most closely with the Personal dimension of the MUM. The sixth question was included with the External Support questions (see below). The willingness to overcome hurdles or disincentives (that is, persistence) is explicitly related to the perceived value of the knowledge or qualification gained in the last two questions in the group. Therefore, these last two questions were analysed with the Motivators/Rewards questions (see below).

2. The COMP (Motivators/Rewards) questions looked at reasons for taking and completing the MOOC. Two of the four were explicitly employment related; hence, they looked at extrinsic motivation and are therefore most closely linked with the External dimension of the MUM. The other two are closer to intrinsic motivation and are linked most closely with the Personal dimension of the MUM.

3. The SE (Self-Efficacy) questions probe the amount of confidence the respondent has to complete, but these do not look only at whether the respondent thinks he or she is sufficiently intelligent; they also probe where the respondent has ancillary skills that help a self-regulated student to succeed. These questions look at student maturity. Self-efficacy is a factor belonging in the Personal dimension of the MUM.

4. The SP (External Support) questions focus on the perception of the extent to which other stakeholders support the student and recognition of the value of completing the MOOC. These questions are related to extrinsic motivation. This is related to the inter-personal dimension of the MUM.

5. The ISP (Institutional Support) questions measure the extent to which the student is dependent on an institution to provide infrastructure, but this group also looks at the extent to which the student has been provided with preliminary information by the institution. These forms of practical assistance offered by the institution presenting the MOOC are linked with the External dimension of the MUM.

5.10.1 Relationship between Concepts Influencing Continuance

The five groups of questions from Section D of the questionnaire were compared to identify correlation using a Pearson's Correlation two-tailed test. Only groups with a Cronbach's Alpha value that rounded up to 0.7 or was greater than 0.7 were used (see Section 2.8.2). The mean values for the questions in each group were calculated for each respondent in order to get a single value to use in the correlations. All the groups had a 5-point Likert scale with options from Strongly disagree to Strongly agree (coded as 1 to 5). As can be seen from the Table 5-1, the overall means do not indicate that the respondents were over accommodating.

Table 5-1: Descriptive statistics

	Mean	SD	N
Persistence (CONT1–CONT5)	2.75	.459	3 119
Motivators/Rewards (COMP1–COMP4 plus CONT7 and CONT8)	2.95	.255	3 119
Self-Efficacy (SE1–SE5)	2.86	.377	3 119
External Support (SP1–SP5 plus CONT6)	2.88	.372	3 119
Institutional Support (ISP1–ISP6)	2.86	.408	3 119

As can be seen from the set of correlations in Table 5-2, all the groups were strongly correlated with significance levels of 0.000. But the relationships between the question pairs of groups are, in all cases, in the range 2.0 to 3.0 and are therefore a low correlation – definite but small relationship (Tredoux and Durrheim 2013). These results are not really very informative and future analysis is needed to derive additional information and it might also be necessary to supplement these with further research. It might be too bold, but it is interesting that the relationships although admittedly weak, are slightly stronger between: The Persistence and Self-efficacy groups (both indicated as being personal); The Self-efficacy and Motivator/Rewards group which the authors said had both intrinsic and extrinsic motivators, and hence, have not finally located in a dimension; and the two support groups (External support and Institutional support) although the authors proposed that External support belonged to the Inter-personal dimension but Institutional support was external. The authors stress that these differences are based on weak correlations and may mean nothing.

Table 5-2: Correlations for question groups regarding motivation to complete a MOOC

		Persistence	Motivators / Rewards	Self-efficacy	External support	Institutional support
Persistence	Pearson's Correlation	1	.270**	.338**	.225**	.210**
	Sig. (2-tailed)		.000	.000	.000	.000
	Sum of squares and cross-products	657.927	98.543	182.067	120.212	122.570
	Covariance	.211	.032	.058	.039	.039
Motivators / Rewards	Pearson's Correlation	.270**	1	.342**	.305**	.257**
	Sig. (2-tailed)	.000		.000	.000	.000
	Sum of squares and cross-products	98.543	202.895	102.417	90.323	83.315
	Covariance	.032	.065	.033	.029	.027
Self-efficacy	Pearson's Correlation	.338**	.342**	1	.298**	.198**
	Sig. (2-tailed)	.000	.000		.000	.000
	Sum of squares and cross-products	182.067	102.417	442.080	130.175	94.795
	Covariance	.058	.033	.142	.042	.030
External support	Pearson's Correlation	.225**	.305**	.298**	1	.365**
	Sig. (2-tailed)	.000	.000	.000		.000
	Sum of squares and cross-products	120.212	90.323	130.175	432.230	172.928
	Covariance	.039	.029	.042	.139	.055
Institutional support	Pearson's Correlation	.210**	.257**	.198**	.365**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	Sum of squares and cross-products	122.570	83.315	94.795	172.928	519.510
	Covariance	.039	.027	.030	.055	.167
** Correlation is significant at the 0.01 level (2-tailed)						
b. Listwise N = 3 119						

5.11 Recommendations

Firstly, the analysis regarding previous experience both in registering for short, online courses and the apparently high completion rate was analysed in some detail by cross-tabulating these aspects with demographic (independent) variables (see Section 5.9.1). These cross-tabulations indicate where registration and completion rates are high and shed some light on factors that may influence them. Additional attention needs to be given to segments of the population of South Africa with low employment who are not registering for, and hence, not completing short online courses (this analysis was not done).

As with strategies to increase registrations, the Pearson's Correlation analysis for the groups of questions in Section D supports the validity of the Conceptual framework (Figure 2-3). Hence, the same recommendation (Recommendation 2) applies.

5.12   Conclusion

This chapter presented the findings from complementary research approaches. The two sets of finding had very little in common, and hence, the one could not confirm or argue strongly against the other. The nature of the survey is such that the authors could glean some interesting facts from the cross-tabulations but the design of the questionnaire prevented us from claiming to what extent the groups of concepts (Persistence, Motivators/Rewards, Self-efficacy, External Support, and Institutional Support) contribute to the Motivation to complete. This was intentional as it was the contention of the researchers that the self-reported perceptions were based on an imagined situation with only some of the respondents claiming to have first-hand experience of studying online.

The workshops were very fruitful and the participants shared useful information that agreed very much with the literature. An extract from a long quotation from one of the participants is being used as the conclusion as it speaks in an authentic way and expresses many of the issues.

> I think completion depends on motivation . . . Motivation to complete depends first of all on a sense of value, what's in it for me, why should I do this, what do I get, and how is it gonna change my world. And the second thing is self-efficacy. You know things like the course is pitched in the right way, at the right pace and in the right sequence so that I believe that I can complete it. So, this is where we need the third which is support so that if a person is struggling here and there, we can intervene and give them a bit of support and motivation so they can continue and that looks possible to me.
>
> So, we have to design the MOOC so that there is a perception that it is achievable, and I am not saying make the course easy but break down the course into smaller chunks so that it can be achieved and there is a sense of progression. But the value statement is crucial, what is in it for me and when a person gets bored the person leaves it because they have lost the sense of value or they didn't get support because nobody answered their question in the forum or maybe there was no explanation on the course content and the course content was confusing. So, it's basics to me. Yes, they are socio-economic factors like falling pregnant or hey I actually got a place at the university, there is nothing wrong with that because I was doing something, but I found another alternative ten out of ten.

Chapter 6: Accreditation

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6.1   Introduction

6.1.1   Research Question

This research question explored in this chapter is: According to potential MOOC students, how important is it that mutual recognition of MOOCs be strengthened and extended?

The research question refers to "mutual recognition of MOOCs". This is understood to mean that one or more group of stakeholders recognise that the accredited MOOCs and associated certifications are of an agreed standard. It is implied that these stakeholders are operating in South Africa. A person who has obtained a certificate of competence for an accredited MOOC, therefore, has evidence that he or she has attained a particular and clearly stated level of knowledge or competence in a particular field.

The funder of the research project stated very clearly that employees who could benefit from taking courses were often reluctant. She explained that this could be addressed if the students received a certificate

> … they want assurance to say when I have done it I will be … recognised, because in South Africa unfortunately we live in a situation where you can only be recognised by the paper, the credit worthiness of the paper that you produce.

She went further to emphasise the need for upskilling employees in order for them to remain employable. She said that companies did not insist on their staff taking courses, but "go the shorter route of saying okay they don't want upset them and we lay them off and then we use technology".

6.2   Background

6.2.1   Stakeholders

The stakeholders referred to above are other higher education institutions (HEIs), professional bodies, industry and most importantly, employers in South Africa. It is not essential that every MOOC be recognised by all of these groups, but a significant number of major individual entities in the group should agree that the MOOC is of value.

For example, a particular MOOC in astronomy, may not be of interest to any professional council.

Developers of new MOOCs would be expected to recognise the importance of satisfying the requirements of at least one of the stakeholder groups in terms of the relevance of the topic of the MOOC, the standard of the content, and the level of achievement of those who completed the course. Several aspects of recognition need to be defined.

6.2.2 Accreditation

Accreditation and certification are two entirely different things. Accreditation means that there is an authority who has assessed an HEI, its qualifications and courses and approves them. Currently in South Africa this applies to HEIs offering formal education, their qualifications and the courses making up the qualification. Generally, the HEIs are universities and colleges, and the qualifications are degrees, diplomas and certificate programmes. One of the functions of the Council on Higher Education (CHE) is to develop and implement a system of quality assurance for higher education, including programme accreditation, institutional audits, quality promotion and capacity development, standards development and the implementation of the Higher Education Qualifications Sub-Framework (HEQSF).

In South Africa, the South African Qualifications Authority (SAQA)[15] carries out the accreditation processes on the instructions of the CHE. Hence, SAQA registers tertiary level courses, verifies those courses, and can also be approached to get foreign qualifications evaluated. SAQA also registers professional bodies.

The 23 Sector Education and Training Authorities (SETAs) for the different sectors (e.g. the Agricultural Sector Education and Training Authority (AGRISETA)) may also accredit courses. Various professional bodies are also accrediting bodies. The professional bodies include, but are not limited to, the South African Board for People Practices (SAPBB); South African Institute of Chartered Accountants (SAICA); South African Nursing Council (SANC); and South African Pharmacy Council (SAPC).

As a result of the CHE/SAQA accreditation, a student who wants to complete his or her studies at a different institution and who has completed an accredited course, will get credit for an equivalent course at another South African institution of higher learning. This is where the mutual recognition occurs. This system of transferring credits to a new university or degree programme is already well established. However, the accreditation process as well as the (mutual) recognition of courses between traditional HEIs and MOOCs is not already in place and may not be easy to achieve. One obstacle is that the courses at traditional universities and colleges have a larger scope of content (hence, the

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[15] https://www.saqa.org.za; Accessed October 10, 2020.

duration of the course is longer); a MOOC covers less material than a traditional, formal education course. However, finding a way around this would be valuable.

The fact that, by definition, a MOOC is open to anyone who wants to take it means that MOOCs will be very varied with respect to topics covered and the students taking them will be diverse, located anywhere and there will be a large cohort of students. The stated objective of massifying education accentuates this openness and diversity. It is for this reason that it would be important to have a variety of associations and organisations, including industry bodies, participating the accreditation process for MOOCs as was highlighted by one of the participants in the workshops. However, a fear was also voiced that the people in the accrediting bodies may not be unbiased, and hence, monitoring of the accreditation process would be necessary.

6.2.3 Certification

Certification means that a certificate is issued to an individual who has taken a course. In the case of a certificate of course attendance, the certificate does not mean that assessment has been carried out or the holder has passed the course. However, potential MOOC students have been consistent in saying that certificates should be awarded for accredited MOOCs; this is a major motivation for registering for a MOOC. Associated with certification of MOOCs are the difficult issues of assessment, credibility and verification of the certificates held by individuals. These issues are discussed in more detail in Section 6.4.3.

6.2.4 MOOC Content Development Partnerships

Well-known MOOC platforms, such as Coursera, edX, FutureLearn and Udacity, acquire credibility for their courses by forming partnerships with a small number of highly regarded universities who develop the MOOC content. Hence, this is a form of inherited and "swift" trust as the potential student and other stakeholders referred to in Section 6.2.1, trust that the MOOC will be of a high standard based on the reputation of the educational institution that developed the course. This strategy has the advantage that only the institution developing the MOOC needs to be accredited and new MOOCs can be developed on demand and quality checking of MOOC content is done immediately within the responsible unit of the accredited content developer. As a result, new MOOCs can be implemented quickly and they are immediately accepted as being of high quality, based on the reputation of the associated institution. The disadvantage of this approach is that it excludes individuals or small or new organisations who might create excellent MOOC content and favours a few, well-established developers most of which are universities with international reputations.

6.3 Literature on MOOC Accreditation and Certification

Accreditation boosts the value of certificates and the likelihood that a MOOC will be recommended by and recognised by employers, other educational institutions, and

funders. It is accepted that accreditation must be done carefully and ethically, and the process of accreditation needs to be carefully planned and regulated. The proposals in the UNESCO (2016) MOOC guide for policy makers can assist in this regard. NCSAP-ICT proposes an accreditation process in which a number of representatives from different sectors are involved; this is intended to provide globally-benchmarked, industry-rated MOOC evaluation, student training, knowledge assessment and certification[16] (Boga and McGreal 2014).

MOOCs within an accredited portal may award certificates:

- on completion of the course (an attendance certificate) (Mendez 2020);
- if the student shows sufficient understanding of the course in assessments; or
- as a separate examination that the student may elect to do after completing the MOOC.

If the examination is a service that is paid for separately, the student need not register for the MOOC at all, but just sit the examination and study the material via face-to-face instruction, offline or read paper-based study material. Examination for separate certification can be expensive (Reich and Ruipérez-Valiente 2019).

Online examinations leading to certification require reliable assessment of the knowledge and skills acquired by an individual MOOC student. The biggest challenge is to ensure that the examination is conducted fairly and that the intended candidate is completing the assessment according to the rules regarding time, allowed reference sources, etc. Hence, certification, other than just awarding a certificate of attendance, is a major challenge and generally requires collaboration with a group of partners (Boga and McGreal 2014; Castillo and Wagner 2015).

6.3.1 Computer-based Assessment

Computer-based testing and computer adaptive testing systems exist that present different candidates with a different set of questions and these can be marked adequately without human intervention. New, innovative versions of these systems, that do not rely solely in test banks of multiple-choice questions, need to be explored where the MOOC platform does not provide this (Debuse and Lawley 2016; Nikou and Economides 2016). Recent publications look at computer-based assessment assessing Mathematics, Accounting, Business Sciences and even language competency (Helfaya 2019; Hoogland and Tout 2018; Rausch et al. 2016; Zeng 2020). Online invigilation of tests and associated ways of verifying the identity of the test taker also need to be investigated to reduce costs.

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[16] Note that here the certification is considered part of the accreditation.

6.4   Workshops

6.4.1   Introduction

This section reports on the sessions devoted to accreditation at the two workshops. The data collected from the GDSS sessions and the open discussion is used. As will be seen, the accredited status of a course is a major factor in motivating people to take courses.

A workshop participant who had taken ICT courses (not necessarily MOOCs) while employed said, "That certification is very valuable for me and my career and also for the employer because it's actually a specific skill that they want but it goes with experience." He explained the value of the courses as supplementing what was taught in university courses by providing practical exercises to establish skills: "We did a Data Warehousing course within Telkom. We were graduates already but we didn't have that specific skill."

6.4.2   The Accreditation Process

It was agreed in the workshop that there is a long-standing and acute backlog (with a turnaround time of 18 months to three years) for the accreditation of formal, university courses in South Africa courses. It was the opinion of the person who raised this concern that this process was simply too slow for MOOCs as "courses in the MOOC environment [need to be] dynamic". The same authorities using the same processes could not, therefore, cope with accreditation of MOOCs.

A new view was offered by a person at a South African university who is offering MOOCs. She said that introducing short courses is a way that universities in other countries are using to introduce new and urgently needed topics into the curriculum:

> They have the same challenges that our universities have of it takes too long to get the curriculum accredited so they run a parallel stream of short courses and all universities should be doing that. Short courses of relevance for real time take-off for industry … So, we really trying to do this which is to respond quickly to industry demands by means of short, targeted learning interventions that address a very particular skills issue. I think if we are talking about MOOCS, the discussion about accreditation is very difficult one.

One suggestion was that that two levels of process should be in place for MOOC courses for the workplace: initially the professional body or industry panel "would just look at the course and say does it have relevance" but "a regulating body can be called on to investigate in the event of absurd or disputed decisions". Hence, the accreditation process would be simplified as much as possible but would be monitored.

However, a counter argument was made that having different accreditation processes for MOOCs and for other qualifications would cause confusion.

As noted in the literature review, some countries already have national MOOC platforms and policies to regulate and encourage the use of MOOCs. These policies could be adjusted to the South African context. However, creating a good regulatory structure is essential. The participants agreed that development of an accreditation process with the necessary ethical standards and credibility is going to need a great deal of thought as it will not be easy.

6.4.3 The Certification Process

Assessment of Candidate

It was explained in open discussion, that online examinations for the purpose of certification can include verification of the candidate's identity (the example of professional certification for certain ICT skills was mentioned). These assessments use images from the candidate's computer camera that is controlled by the remote invigilator to try to ensure that the person taking the examination is indeed the registered candidate. Other biometric technologies can also be used. There was, however, some scepticism as to whether this system was sufficiently robust and whether it was scalable to MOOC courses with high enrolments.

Certification examinations are often done separately from the delivery of content by a MOOC. Here the cost of registering for the MOOC may be low but there may be higher costs involved for the certificate examination when thorough procedures are carried out. The cost of R2 000 was mentioned for certification examinations in South Africa. According to a participant in the workshop, the separation between access to the MOOC content and the examination is prevalent in the international arena:

> Nowadays everyone wants a formal qualification that is recognised and registered. If I look at … the qualifications that are done at American universities, they will often design a MOOC that is initially for free. It is basically to introduce the audience to the current formal programmes that are available. And then once you want that certificate you have to pay something like $50 or $100.

The high cost of the examination might cause candidates to postpone it until they are certain they will pass. The delay and not having a fixed examination date might mean that they keep putting off the final period of intensive revision and never take the exam.

In the workshop discussion it was said that not all certification is stringently administered nor does it really test mastery of the content properly. Hence, passing the MOOC may not be a reliable indication that the student has the knowledge and skills needed to be employed.

> I've done MOOCs but I haven't completed anything. I did a 4-week course in Search Engine Optimization. I only watched 1 video. It had about 4 or 5 questions each. I paced my way through and I have a certificate in Search Engine and Optimization. It looks

very quality with various assessments and just because I have a certificate doesn't mean I know SEO; it doesn't mean I can work as an SEO person.

I think there should be some sort of assessment before a person is accepted to the actual exam. I have heard of situations where people buy data bases of questions and answers so that they end up not learning at all.

Verification

The need for verification of certificates, other qualifications, and other forms of recognisable awards (e.g. badges) was noted. Unfortunately, there have been media reports of falsified certificates (not necessarily MOOC certificates) but statistics regarding the frequency of this falsification have not been found for this report. The verification process involves checking that a certificate presented to a potential employer by a job seeker is genuine. This process generally involves comparing the certificate with databases maintained by the institutions which award the certificate, and in South Africa, various organisations already exist which do this for a small fee.[17, 18, 19]

A participant drew attention to other possibilities that exist to address the difficulties with confirming the student's identity:

But trust-based certificates are essentially a mechanism … for getting recognition if there needs to be a connection back to the institution for verification. In other words, if ever presented it will have to verify a number of a certificate when a person did this, etc.

This strategy does not confirm the identity of the individual because it is a trust-based certificate, but it confirms that this learning took place, was completed and with which institution or MOOC platform.

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[17] You can verify your educational qualifications on the National Learners' Records Database (NLRD) (link is external) via SAQA VeriSearch (link is external) at South African Qualifications Authority (SAQA) (link is external). If you are an employer, you can also confirm the qualifications of your employees on the database. If you want to check your own information, you will receive the full record of what the NLRD holds concerning you. https://www.gov.za/services/tertiary-education/verify-qualifications; Accessed October 8, 2020.

[18] MIE All qualification information is obtained directly from the institution. Authenticate the certificate to ensure the qualification is legitimate, MIE processes the highest number of qualification checks per month in South Africa. https://www.mie.co.za; Accessed October 8, 2020.

[19] The QCTO can verify trade certificates issued by the following entities/departments: Department of Manpower, Department of Labour, Department of Higher Education and Training. https://www.qcto.org.za/services/certification-and-verification/verification; Accessed October 8, 2020.

Another strategy involves badges. These can be added to a LinkedIn account and since LinkedIn is already established as a way of linking employers seeking candidates and suitable people for the job this builds a credible network:

> Those certificates have badges and when you qualify you get a badge; the badge means that it is already verified` … after you have passed the course you get a badge. You can also print out certificates. The important thing is that you get this badge and is included in your LinkedIn account. So, it is verified that you have done the course and you have passed it. In fact, as a motivation for registry, knowing that you get a badge that is acceptable to an employer is a motivating factor.

However, another speaker pointed out that not all MOOC service providers are equally reliable: "We struggled to get the badges of the 20 to 30 people that were trained and completed and got certificates."

Credibility and Recognition of the Standards of MOOC Content

In order for the MOOC to be considered of value to the student and the employing organisation, there needs to be trust in the provider of the MOOC, in the quality and relevance of the content and how recently the content was updated (this is particularly of interest in fields where content rapidly becomes outdated). Hence, ongoing auditing of the quality of MOOC content and monitoring associated administrative processes (such as registration) that are carried out using the MOOC platform, is essential to the credibility of the accreditation process. However, good quality content that fits the needs of South African students should be included (Adam 2019)

Recognition of a MOOC and acceptance of the regulation of the MOOC eco-system may take time to establish. The accrediting authority needs to make a deliberate effort to reach and interact with employers, other educational institutions and prospective MOOC students to convince them that the MOOC qualifications accredited by that authority are reliable and can be depended upon to show that the person with the certificate has gained the requisite knowledge or skills.

Recognition of Prior Learning

Recognition of prior learning (RPL), including practical experience, has already been used in South Africa as a way of gaining entry into courses. Learning pathways need to be explored, and students who can prove that they have relevant work experience may be given credit for some parts of the linked series of MOOCs. The value of experience obtained during internships and volunteer work as a student or before obtaining "a paying job" was highlighted by the group at the workshop. Not only should this be included in a job seeker's CV, it should also be recognised as part of a qualification.

RPL may also be associated with a point raised earlier regarding getting MOOCs recognised for exemption from taking a university module:

> For me it's an issue to do with recognition in the mainstream public institutions. For instance, if I were to enrol for a project management course at a university after doing the MOOC on Introduction to Project Management, do I need to repeat that course?

A workshop participant pointed out that not all employees have the confidence to learn new skills or master new knowledge and then sit a certification examination:

> They are now afraid because they have the skills, now you say go and do something else, they need to do a certification on that. How do you get those people there and keep them there and make sure that they get motivated?

Thus, a real fear of failure was identified.

Conversely, in line with the FBM (see Figure 6-1), if employers offer sufficient encouragement or rewards (extrinsic motivation) to employers to complete a course that is recognised as valuable to the organisation this may encourage them to register, complete and get certification.
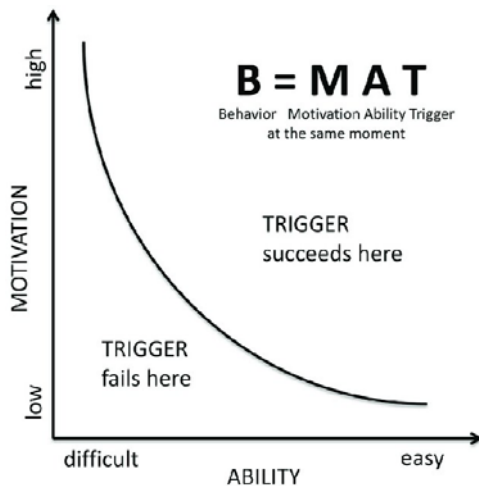
Figure 6-1: The Fogg Behaviour Model

Recognition of the employee's workplace experience and formal recognition of prior learning has been proposed as a possible solution to resistance to adapting to changing job requirements. Certification may be of greater value for and unemployed or under-employed person than it is for someone who is employed but not very confident.

6.4.4 Suggestions

The following suggestions were made in the workshop (largely repeated verbatim). These are the basis on which the proposed SA MOOC ecosystem (Chapter 7) will address the issue of accreditation.

The effort to reduce unemployment by encouraging job seekers to improve their skills and qualifications cannot succeed unless the MOOCs recommended on the portal are recognised by employers. It is essential, therefore, that groups representing employers and even individual employers contribute information regarding positions in their organisations that are difficult to fill and corresponding job descriptions and qualifications required. Ideally, employers could assist in the process of evaluating MOOCs to see whether they match the requirements for jobs. A suggestion by someone at the workshop employed in the public sector was:

> Government can start by saying … that all the Government departments must recognise the certificates that you obtained from MOOCs. But then you have diplomas and degrees and Master's degrees and all this stuff. But that's how we can start. At the municipal level, please recognise these may be entry level certificates, we can start with them instead of matric.

Another participant spoke on behalf of the prospective MOOC student who is encouraged to obtain an accredited certificate:

> Are you going to get a job immediately after this, are you going to put me in a job or you are just going to train me and leave me like all the other do. That's the main challenge we face mostly with your online courses.

This issue of getting a job links with the suggestions in Chapter 4, firstly that employability requires certification and secondly the need for visible links on the portal between jobs where there is a skills shortage and MOOCs. This adds an important component to the portal that would need to be kept up to date (ideally automatically). It could include links to recruitment portals, possibly to advertisements on those portals that match the qualifications of a job seeker.

Evolving System of Accreditation

> Allow this process first to evolve … and do proper monitoring and evaluation throughout the process. And then after five years let's have this discussion again … if we're going to complicate it too soon, we are going to fight a losing battle. Sometimes if you structure things less, allow them to evolve, you will be amazed with the results.

Collaboration on Accreditation

This has been reworded slightly: Accreditation should not only be done by SAQA or SETA. There should be accreditations by registered organisation bodies as well, for example, the Engineering Council of South Africa, the Electricity Council, SAICA, etc. That could make the accreditation process fast, more efficient, and more insightful. In this way a benchmark would be established showing what can be achieved; the improved turnaround time could highlight existing challenges in the accreditation processes carried out by Government entities in terms of speed of delivery. There might

be a shared responsibility, some of the courses could be accredited by professional organisations while others are accredited by Government organisations.

Courses that are internationally accredited should be recognised immediately, because if they are accredited and they want to share the curriculum with us, why go through the process?

Regulation

A participant summed up some aspects of this:

> So, there will always be unregulated, unaccredited content; I don't believe the Government will step in and regulate all MOOCs when they become available. We're trying to build a working environment for MOOC with a separate platform and are we going to regulate [some] content and say the content on this platform is content that is regulated or accredited … So, are we offering some value by saying this is an endorsed set of MOOCs?

6.5   The Survey

This section looks at the three questions in the questionnaire that refer to accreditation (see Addendum B, Section B).

6.5.1   Accreditation

Validity of the three accreditation questions ACC1 to ACC3.

Table 6-1: Reliability statistics for accreditation questions

Cronbach's Alpha value	Cronbach's Alpha value based on standardised items	No. of items
.543	.570	3

The three questions in this set cannot be considered to form a coherent group as the Cronbach's Alpha value (Table 6-1) is less than 0.7 – they do not all test the same thing. This is an important finding as it implies that the respondents do not consider different accrediting agencies to be equally reliable or to have equal status. (These are: a recognised and authorised South African authority; an employer or other accrediting agency recognised as reliable by the employer; a non-South African accreditor).
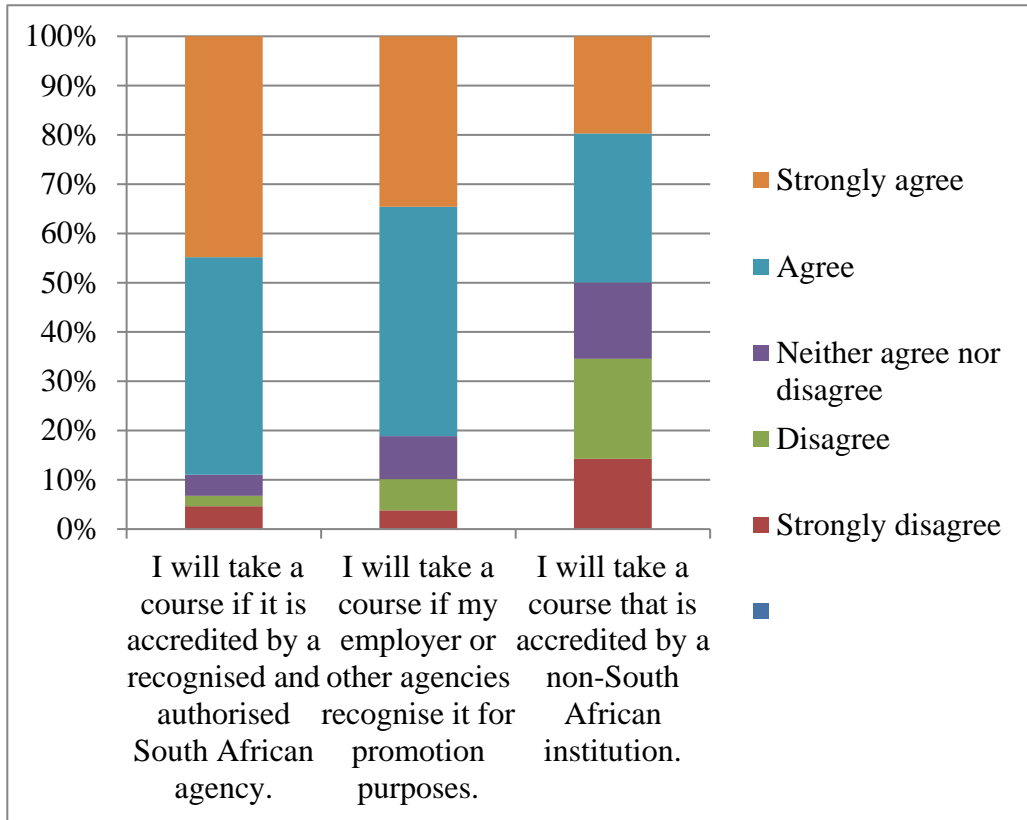
Figure 6-2: Comparing the responses for the three accreditation questions

Nevertheless, the data (Figure 6-2) shows that there is a clear need for accredited courses with a great need for courses which are accredited by a South African agency (nearly 90% of respondents would take such courses adding Strongly agree and Agree). Just more than 80% would take a course for promotion purposes (by implication such a course may not be formally accredited but is recognised by an employer or other agency). Only 50% of respondents are interested in taking a course recognised by a non-South African institution (presumably these do not fall into the previous group of courses recognised by the employer). Hence, it may be necessary for certificates for courses issued by institutions outside of South Africa to be explicitly endorsed by the central accrediting agency in South Africa.

6.5.2 Correlations between Constructs (Dependent Variable)

Table 6-2: Descriptive statistics

	Mean	SD	N
Accreditation questions (ACC1 – ACC3)	3.818	.8197	3125

116

The Pearson's Correlation values for the relationships between the mean of the Accreditation questions (ACC1 – ACC3) and the other groups are all small (below 0.2) (Tredoux and Durrheim 2013). This means that, although there is almost no relationship between the answers relating to accreditation and the other groups of questions (MOOC Functionality, MOOC Accessibility, MOOC Advantages, Registration, Personal) shown in Table 6-3, the survey takers thought that accreditation is important for all courses but they did not particularly relate this to registering for a MOOC.

Table 6-3: Correlations for question groups regarding motivation to register for a MOOC

		Mean: I will take a course	MOOC Function-ality	MOOC Accessib-ility	MOOC Advant-ages	Registra--tion	Personal
Accreditation	Pearson's Correlation	1	.178**	.108**	.181**	.156**	.129**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	Sum of squares and cross-products	2099.232	195.958	143.750	186.548	170.800	143.937
	Covariance	.672	.063	.046	.060	.055	.046

6.6 MOOC Accreditation and Quality Control Characteristics

Chapter 6 is devoted to the research question and topic of accreditation and a totally new MOOC accreditation process is proposed.

A list follows of aspects that would possibly be included in a scoresheet to be used by the group tasked with assessing an application to have a MOOC accredited or approved. Making the criteria visible (transparent assessment) is important and the process needs very careful deliberations. Therefore, this list is simply a list of items that might be considered when assessing individual MOOCs:

- achievable;
- assessment;
- convenience;
- cost;
- course content (topic, relevant skills, and amount of detail, new/up to date);
- customised content and interfaces (understandable to the target group);
- independent learning;

- MOOC design and structure;

- MOOC benefits (what makes this MOOC better than similar MOOCs);

- practical element;

- preview initial practical information (interaction, is it a fit exploration, learning style);

- provider service and credibility regarding student needs; and

- provider service and credibility regarding technical quality.

6.7 Conclusion

The discussions in the workshops related to accreditation yielded valuable insights which was called a Totally New Accreditation Process. A complex, inclusive, collaborative MOOC ecosystem will require a strong accreditation process. It was clear that accrediting MOOCs, MOOC platforms or specific groups of MOOC content developers is desirable but will not be easy.

There were many references to the proliferation of MOOCs of dubious standard. Achieving the goals (a strong accreditation process) will require careful planning, possibly a phased in process and monitoring of the accreditation process. There was consensus that a collaborative process with many collaborating parties was needed. The burden on smaller or new MOOC service providers of needing to become accredited could result in unintended consequences such as "work around" processes. These, in turn, could mean that the portal is not used and the cost of developing it would be wasted.

Separately, challenges were identified regarding the cost and complexity of examining MOOC l students as part of a certification process. Online assessment has recently, as a result of closure of universities and colleges due to the Coronavirus pandemic, been introduced at many universities and lessons will be learned from this. However, the workshops preceded this new way of work and the lessons from lockdown and how these affect MOOC certification processes are a matter for future research.

The analysis of the survey data regarding the three questions in Section B of the questionnaire confirmed the importance of recognition of MOOCs and the certificates awarded by a reputable South African authority (see Section 6.5.2). However, this did not correlate with other questions in the questionnaire relating to intention to register for a MOOC. The fact that such a relationship was not evident does not entirely exclude the possibility that a relationship exists – there were no questions in Section C of the questionnaire that referred to accreditation but two questions in Section D of the questionnaire, relating to course completion did refer to accredited courses.

Accreditation of MOOC courses by South African authorities recognised by employers and other institutions, such as HEIs, is important. Between 80% and 90% of the survey respondents agreed or agreed strongly that this was the case. The workshop participants agreed that accreditation was desirable.

Chapter 7: Government's Contribution to the MOOC Ecosystem

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7.1   Introduction
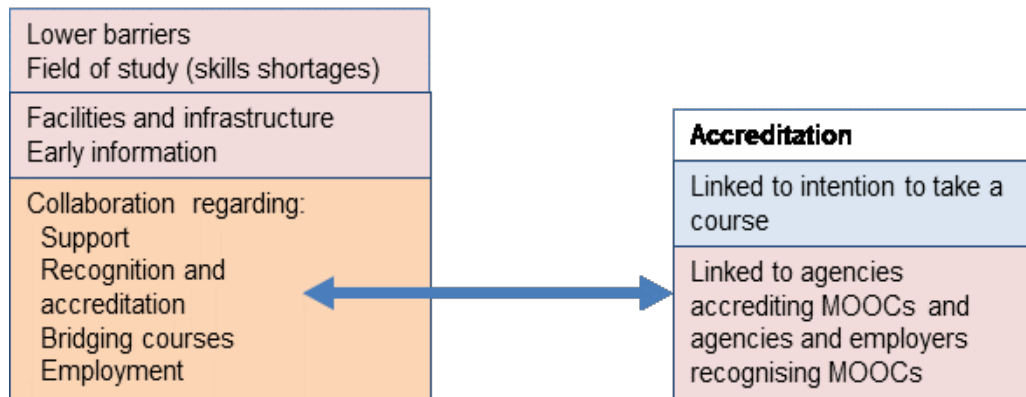
Figure 7-1: Some of the things Government must address

The MOOC ecosystem proposed in this chapter is a form of recommended system; in other words, its primary objective is to assist potential students to:

- identify possible careers based in part on information provided by the SA MOOC portal about employment opportunities;

- access information about associated learning paths that will assist the student to incrementally build up qualifications required to enter that line of work;

- find appropriate MOOCs that have been assessed by a suitable panel;

- get more preliminary information about each suitable MOOC.

The MOOC ecosystem will be a "shop window" or a limited way of advertising to third-party service providers as links will be provided (provided permission is obtained) from the portal to other sites.

7.2   Studies on Government Support of MOOCs

The articles in this section make suggestions regarding Government policy. Colucci, Muñoz and Devaux (2017) report on the *MOOCs4inclusion* study for the Joint Research Centre of the European Commission in 2016. The authors concur with Boga and McGreal (2014) when they say that the background of potential learners and the context of use must be accommodated in the design of the MOOC. Partnerships are needed with organisations able to provide supporting and complementary services, a blended learning approach, where the learner receives both face-to-face tuition and uses MOOCs and further forms of facilitation are recommended (Colucci, Muñoz and Devaux 2017; Kopp, Gröblinger and Zimmermann 2017).

Of interest to policy development is the UNESCO (2016) report (cited by Marshall 2016). The report says that "MOOCs were not the comprehensive packages they were made out to be in mainstream media. Various components of MOOCs could be re-engineered to suit the needs of learning for sustainable development" (UNESCO 2016). As part of the MOOC ecosystem, the report recommends that facilities be included for "Much higher intensity of mentoring" (UNESCO 2016). As is the case for all forms of distance education, quality assurance is also considered to be essential (Prinsloo 2016; UNESCO 2016). Hence, the report stresses that "Governments should develop or strengthen quality assurance MOOC ecosystems for the recognition, validation and accreditation of flexible learning pathways as part of their broad development agenda" (UNESCO 2016). Accreditation is another important aspect that the report provides guidance on.

In terms of policy, Colucci, Muñoz and Devaux (2017) refer to adherence to the already existing Bologna Architecture, which encompasses recognition of MOOC certificates, quality assurance and qualification, MOOC ecosystems and transparency tools (learning agreements, learning outcomes and alignment with the European Credit Transfer System). The paper does not go into detail regarding how this will be done but says "higher education should consider employing these tools from the start, and working with partner universities and national authorities to do so" (Colucci, Muñoz and Devaux 2017, 101).

MOOC ecosystems and mechanisms for funding are also addressed by these authors and they recommend small fees for certification, sharing resources between partners to reduce costs, and EU funding "to support bottom up solutions, such as dynamic partnerships of NGOs, public, private actors, educational institutions and tech developers" (Colucci, Muñoz and Devaux 2017, 101–102). This topic is addressed in the UNESCO MOOCs guide for policy makers and elsewhere (Prinsloo 2016; UNESCO 2016).

The final piece of policy advice from Colucci, Muñoz and Devaux (2017) that may be useful to South African policy makers, is the role of a national agency to coordinate, communicate and share data from impact studies as a way of reflecting on what is

working and what is less effective. This involves monitoring and evaluation but may also be part of research and development (see Sections 4.5.8, 4.6.3 and 4.6.5). Hence the agency plays an extremely important role in creating optimum value by facilitating the working relationships between the partners and stakeholders.

7.3   The Survey

7.3.2   Barriers

Issues regarding infrastructure are highlighted in sections 3.5.2 and 5.5.3. Although they are not repeated here, both Barriers and Infrastructure are noted in Figure 7-1 as some of the things that Government must address.

The information received from the survey about field of study choices (Table 7-1) can advise the agencies making MOOCs available regarding the preferences of members of the South African public. The list corresponds well with the most popular MOOCs available internationally. Hence, the preferences of potential MOOC learners do not raise problems regarding existence of MOOC content. However, it should be noted that the questionnaire consisted of a given list of options from which the respondents could choose and hence influenced and limited the choice of respondents. Different answers might have been obtained from a questionnaire with open-ended questions.

7.3.2   Choice of Fields of Study

Table 7-1: Frequency of field of study choice (sorted on first choice)

Field of study	1st choice	2nd choice
Science, technology, engineering or mathematics	858	362
Business management (e.g. entrepreneurship, human resource management, accounting and financial management)	669	444
Life sciences (e.g. medicine, agriculture, i.e. anything to do with living things)	498	424
Social sciences (e.g. geography, history, psychology, sociology, etc.)	374	344
Arts and languages	304	380
Courses related to one of the trades (e.g. plumbers, electricians, tool and dye makers)	190	278
Courses related to a career for which registration is needed with the bodies regulating the industry (e.g. estate agents, security, etc.)	101	253

There is, however, another important perspective, that of the skills that are in short supply in South Africa or scarce skills. A draft list of skills in demand has recently (17 August 2020) been published for comment.[20] The list is said to include:[21]

- several categories of ICT specialists and engineers;
- foreign language speakers;
- chefs;
- winemakers;
- tobacco graders;
- tour guides;
- nurses;
- riggers;
- actuaries; and
- software engineers.

No attempt has been made here to compare the choices reflected in Table 7-1 with the list of skills in demand but Government's list should be highlighted in an awareness campaigns. The importance of recommending MOOCs suitable for finding employment or for advancing a career or changing to an entirely new career path is discussed extensively in Section 4.6.6). The information about popular fields of study may be worthy of additional attention. Possibly an attempt to find out why these fields are chosen by asking respondents to link them to a future career or job opportunity would add substance to this set of results.

7.3.3 Government's Role

Figure 7-2 shows the responses to the individual questions in Section E of the questionnaire (Government's role). These are shown as percentages. It is clear that almost all of the respondents agreed or strongly agreed with all of these statements. This may be for any or all of the following reasons:

- The options were all obvious recommendations and were uncontroversial.
- The questionnaire was very long and this was the final set of questions. This, the respondents were tired or had lost interest and were inclined just to agree.

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[20] https://www.dhet.gov.za/SiteAssets/Gazettes/2020/43621_17-8_HighEduTrain.pdf; Accessed October 25, 2020.
[21] https://businesstech.co.za/news/business/431070/these-critical-skills-are-in-high-demand-in-south-africa (September 2020); Accessed October 25, 2020.

- The respondents had not really thought about what they would like Government to do and possibly open ended questions would be better.

A future questionnaire might gather more useful information with more probing questions, but the authors are of the opinion that in a survey distributed to "typical members of a national population", the respondents will very rarely disagree with any suggestion about what Government should do. The current research design that complements the data from a survey with qualitative data assists in addressing this. Figure 7-3 presents the same information, but the y-axis shows the number of responses (frequencies instead of percentages).
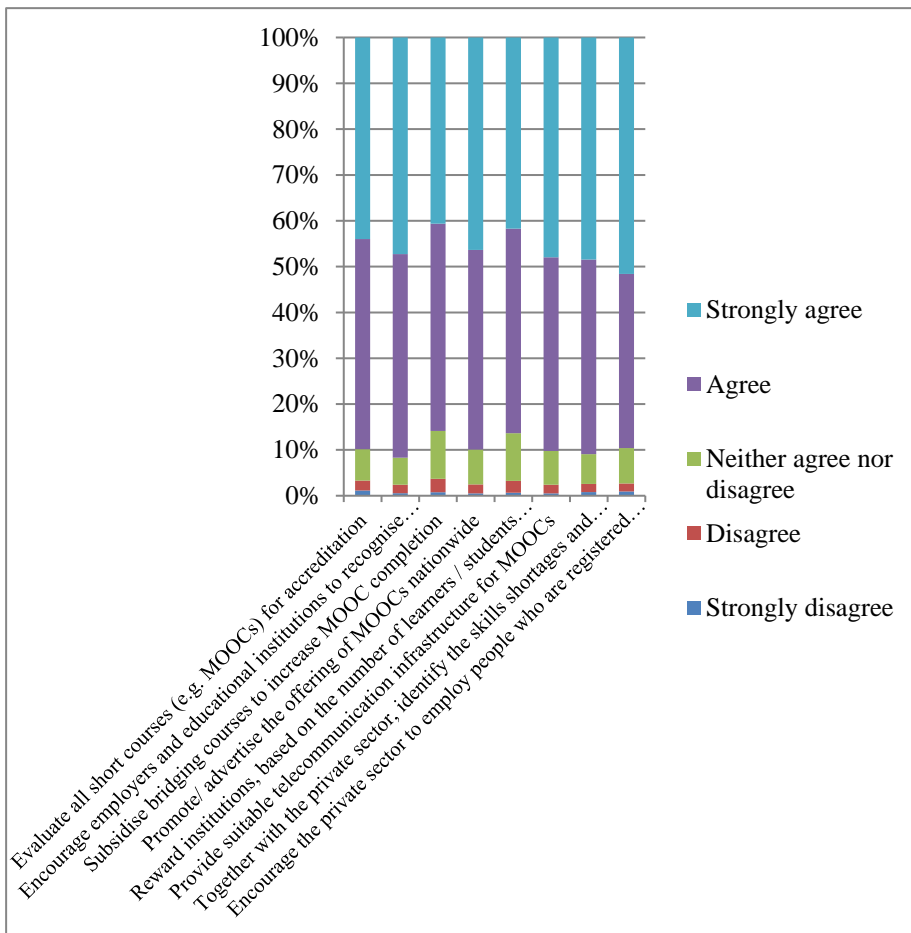
Figure 7-2: Stacked column graph of recommendations by respondents regarding Government's role
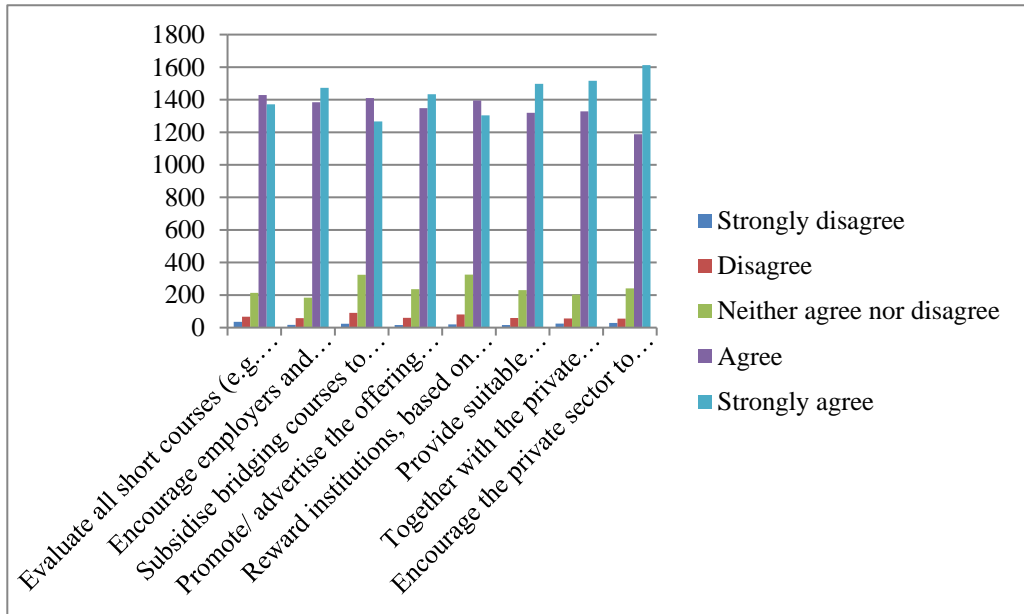
Figure 7-3: Clustered column graph of recommendations by respondents regarding Government's role

7.4   Workshop Discussions

There were two GDSS sessions (documents generated automatically by the GDSS) and two transcription documents from the audio recordings taken on the two days. The findings that follow came from those data sets. The MOOC ecosystem that is proposed for South Africa in this chapter needs to accommodate as many of these enhancements and additional functions as is possible, but, as will be repeated later, the proposal is that the development of the ecosystem be done incrementally. The suggestions are compatible with the points highlighted in the studies on Government support of MOOCs (see Section 7.2).

7.4.1   The MOOC Ecosystem

The comprehensive MOOC support structure which is proposed will be referred to as a MOOC ecosystem. This is broader than a MOOC platform and includes several components that will carry out services to encourage the uptake of MOOCs in South Africa and that will provide MOOC students with additional support to improve completion rates for the MOOCs selected. For each of these a complete business analysis will be required starting with feasibility studies and cost benefit analyses. The business processes enabling these services need to be carefully designed, and if viable, be implemented. The resources required must be identified, quantified, and obtained.

The ecosystem is expected to be visible as a MOOC portal (a web site that links various services and sources of information) to the public and to those collaborating in presenting MOOCs or providing support service.

7.4.2 MOOC Ecosystem Development Concerns

This section highlights issues that require attention when designing, planning and implementing a management and operational structure to support the use of MOOCs in South Africa.

The discussion identified many concerns and made several practical suggestions. These have been grouped as follows:

- six underlying principles that need to be enabled, such as: collaboration, ownership, partnerships, added value, inclusivity and feasibility;

- essential strategic management issues, such as: recognising this as a matter of national priority; policy development; choosing a strategy; creating a long-term plan;

- ongoing and operational activities, such as: creating awareness, creating partnerships, doing research, quality control;

- some of the role players, such as: the Government, private sector, community leaders, and resources required (staff, investments).

Brief descriptions are provided for each aspect (enhancements, functionality or activities), but the names given to aspects are expected to be self-explanatory.

7.4.3 An Alternative Approach to MOOC Teaching and Learning

Alternative Learning Model

It was suggested that new MOOC models should be considered, including but not limited to xMOOCs and cMOOCs (see Blackmon and Major 2017 for more categories of MOOCs) (see Section 5.2.4). The workshop participants were in favour of exploring the feasibility, sustainability and evidence of efficacy of mixed models as future research. These could be blended (as proposed by Dale and Singer 2019) or hybrid (Fidalgo-Blanco, Sein-Echaluce and García-Peñalvo 2015; Liyanagunawardena, Adams and Williams 2013) but these need to include possibilities for more personal or group support by a mentor, tutor or members of the learning community who have already completed the course but have volunteered to continue playing a supporting role.

Student Mentoring

The advantages of obtaining the support of community leaders is noted under Section 7.4.7. However, as noted in the literature review in Section 5.2, the high non-completion rate of MOOCs is attributed in part to insufficient personal attention and encouragement (mentorship but also academic assistance). There are suggestions in the literature of hybrid and blended models which could include local tutors or online tutors (Boga and McGreal 2014; Colucci, Muñoz and Devaux 2017; Kopp, Gröblinger and Zimmermann 2017; UNESCO 2016). There are also suggestions in the literature of ways to prepare potential MOOC students better and to increase the likelihood of a fit between a MOOC and the prospective student's abilities, aspirations, student maturity and ancillary skills (see Section 5.2).

This concept of additional student support is sometimes called "wrapping". It is intended to:

- be inclusive – all students should have access to the support, and hence, the support needs to be accessible when required;

- provide interaction which includes support as well as active participation by the student with appropriate feedback, and hence, involves assessment of knowledge;

- monitor progress – this is particularly important as a way to encourage a student to complete the MOOC;

- include peers and private groups – this is discussed as a feature of cMOOCs (see Section 5.2.4);

- encourage student engagement – this is similar to interaction but emphasises the importance of active participation by the student;

- include student groups – this is very similar to peer group support;

- promote regular interaction with tutors but also on request.

Learning Community

This is particularly associated with cMOOCs but can include local study groups and people who have completed the course but are prepared to act as advisors and mentors to new students.

Ancillary Skills

The need for relevant skills includes ancillary skills, such as the "Student Success Toolbox Student Toolbox Project" (Brunton et al. 2017) and the "MOOC Survival Course" (Liyanagunawardena, Williams and Adams 2014), as well as computer skills

courses, language skills, communication and "people" skills, and time management skills.

Scarce Skills

MOOCs that address particular scarce skills could receive particular recommendations linked to employment. The data from both the workshop data sets (and from the survey of potential MOOC students) shows that the motivation to register for and complete MOOCs is particularly high where there is a better chance of finding employment (chapters 4 and 5).

Assessment

Both formative and summative assessment are needed – finding service providers or MOOC platforms that can offer reliable, credible and achievable forms of assessment, taking into account the most recent forms of adaptive testing and other forms of adaptive MOOCs (Blackmon and Major 2017) and peer reviews needs to be on the agenda.

One of the criticisms of open distance learning systems is the doubt that the work submitted for assessment is in fact that of the student. Increasingly this is a problem faced at universities regarding essays, dissertations and theses as well. This is a serious problem that needs an innovative solution (see also Section 6.4.3).

7.4.4   Six Underlying Principles That Need to Be Enabled

Collaboration

This is the central concept relating to the implementation of the MOOC ecosystem. Collaboration by the public sector and various interested parties in the private sector is recommended in the literature (UNESCO 2016). Different groups will be involved in different components of the ecosystem (accreditation, quality control, provision of student support services, updating information such as career guidance information with associated career pathway information, etc.). Private sector organisations (in their role as employers), universities, professional bodies and institutions have important roles to play, not only as advisors and consultants but also actively participating on an ongoing basis in quality control. The advice from Colucci, Muñoz and Devaux (2017) on the role of a national agency to coordinate, communicate and share data from impact studies is appropriate here.

Ownership

This point complements the central idea of collaboration as stakeholders who are invited to participate in planning and developing a system assume ownership to some extent and this in turn encourages long-term support for and use of the system. Ownership does, however, also imply a national sense of ownership of the proposed MOOC portal,

mutual recognition of the certificates and qualifications and other aspects of universal recognition of the MOOCs. National ownership may require that some customised MOOCs in local languages and addressing national concerns are included even though these may have relatively few prospective students. However, some components of the system may be owned by private organisations or partnerships which retain control over that component to some extent and retain intellectual property rights.

Partnerships

Partnership agreements might be more formal than the consultation and collaboration referred to above – they may be international partnerships.

Added Value

The intention of this underlying principle is to be innovative and to do things in a new way, but to include features and functions that will truly add value. Colucci, Muñoz and Devaux (2017) address this issue when they say that the national agency plays an important role in creating optimum value by facilitating the relationships between the partners and stakeholders. Section 7.4.9 elaborates on characteristics and functionality that add value.

Inclusivity

This is an over-arching requirement built into the need for open entry to students. However, it also can be applied in allowing for many contributors to the proposed SA MOOC ecosystem as partners, collaborators, researchers, and consultants.

Feasibility

As will be evident from the discussion that follows, developing and maintaining the ideal MOOC ecosystem is a major undertaking. Before looking at the items in the groups that follow (sections 7.4.5 to 7.4.11), the need to assess the feasibility of the MOOC ecosystem and of the different components needs to be noted. Although the combined list of concerns is extensive, few if any items can be ignored when *planning* MOOC support that should be facilitated by Government. A critical appraisal of the work involved and the feasibility of attaining the objective is essential. The issues listed below must be examined critically against this high-level issue. The rapid initiation and the long-term sustainability of the endeavour depend on this.

7.4.5   Essential Strategic Management Issues

National Priority

There are several aspects of the proposed MOOC ecosystem that make it worthy of consideration as a national priority for South Africa. These include the current high

unemployment rate, the stagnating economy and the opportunities that the 4IR might bring to emerging economies and to South Africa's very unequal society.

Hence, the key requirement is that MOOCs are accessible to most citizens. To be inclusive, MOOCs must:

- be accessible (including access to the required infrastructure);
- be affordable;
- have minimal formal entry requirements;
- include good student support (seen as improved services); and
- be innovative.

Policy

This item points to the need to develop a policy that is informed by and makes appropriate use of policies from other countries.

Strategy

The whole of Section 7.4.5 is intended to assist in developing a strategy. In particular, the proposal of an incremental and evolutionary approach together with principles from Section 7.4.4, namely, consultation and collaboration with a broad spectrum of stakeholders, and active involvement of third-party service providers and partners are seen as strategic components.

Long-Term Plan

This links with the need for sustainability and future expansion.

Future Expansion

At least one of the workshop participants made the point that an incremental approach would be advisable. Implementation of several of the ideal components might have to be postponed to a later date.

Bureaucracy

As will be seen under sections 7.4.5 and 7.4.6, there was a concern that this MOOC portal would need rapid and ongoing revisions to meet needs as they arise. In addition, the information reflected on the portal (retrieved from databases) must be kept up to date. This is essential if the value of the portal is to be recognised by the large number of groups using it or contributing to it. Hence, a way is needed to make this operational unit responsive and to limit bureaucracy. The portal databases need to be easy to update.

Rollout Time Frame

This was referred to as part of Long-Term Plan, Future Expansion and Bureaucracy under Section 7.4.5. It was noted that the formal education sector, in particular universities, find it difficult to respond quickly to the requirement for developing new courses and getting these approved. The universities are in several respects considered to be in competition with the MOOC platforms that are more agile in their ability to create new MOOC content.

New Regulation

New top-level regulation processes will be needed in addition to the new MOOC accreditation processes. This is a challenging part for Government who will need to either create or contract an agency to coordinate, communicate and oversee this ecosystem. The approach of incremental implementation will make this more feasible.

7.4.6   Ongoing and Operational Activities

Awareness

The workshop participants were clear that, particularly in the case of unemployed youth and women in the less well-resourced areas, there would need to be an extensive and continued awareness campaign to explain what MOOCs are, why they are useful and what skills and resources are needed to use them. The workshop participants said that multiple media and not just the envisaged SA MOOC portal should be used in this campaign. This is discussed in some detail in Section 4.6.1 as part of the discussion on motivating prospective students to register for MOOCs.

Cost

This refers particularly to the cost of MOOC study material to students (not all MOOC material is available at no cost as an OER), cost of data, and possible hidden costs or extra costs for assessment, certification and verification of certificates. The literature refers to the changing MOOC business models and how these result in changes regarding who are the targeted MOOC users. Both the business models and the changing focus to target new student groups have evolved, with the goal of making the MOOC platforms profitable or even viable (Reich and Ruipérez-Valiente 2019). Decisions regarding providing customised MOOC content, using MOOC platforms that use content protected by copyright rather than OER and many other cost factors would need careful review in future policy development – this was not attempted in the book.

Research

The overall system is expected to evolve over time. Its effectiveness and its ability to respond to changing technology and changing societal demands (including the need to

keep abreast of new skills and knowledge requirements so that businesses can remain competitive) all require a research component.

For example, future research could elaborate on MOOC characteristics that are considered desirable and these could be used by the regulator or accrediting agency as a checklist or to create a scoring scheme to assess the suitability of a particular MOOC. Published studies have observed students as they studied using a MOOC. A comprehensive search to find such studies was not done, and hence, this should be undertaken as part of a further study.

Measuring MOOC Success

As noted in the literature review, there are complementary ways of measuring MOOC success (see Table 2-1, Table 2-2 and Table 2-3 in Section 2.2.1 as well). However, quality control underlies accreditation of individual MOOCs and of sets of MOOCs provided by trusted (or accredited) MOOC service providers and accessed via the SA MOOC portal. Confidence in the relevance and standard of MOOC content is important in encouraging uptake and mutual recognition of MOOCs. Quality control will be facilitated if a clear set of criteria, guidelines and even a process can be developed to assess the probable value of a proposed MOOC and the actual value and impact of existing MOOCs. As is the case with many (or most) of the items in this discussion, this is a non-trivial task that a task team would need to tackle.

Quality Control

This has been covered to some extent (see New Regulation under Section 7.4.5 and Measuring MOOC Success under Section 7.4.6). It is believed that the credibility of a MOOC ecosystem will take time to become established and is heavily dependent on independent and rigorous quality control. It is important that the perception of quality be established early to overcome reluctance to participate in new forms of education.

7.4.7 Role Players

Government's Role

In the workshop, a senior person from the public sector made the point that the role of Government departments is to create policy and not to implement it. However, it is hoped that if this initiative does go ahead, there will be visible support for the research project by the South African Government.

Private Sector

This has been referred to under Collaboration and Partnerships in Section 7.4.4. It includes looking at the roles that professional bodies can play, that particular for-profit business organisations in different sectors can play in advising the operational unit on

their specific needs for upskilling and reskilling and making formal qualifications accessible for their staff, and the challenges, and opportunities this can bring.

Leadership

A community activist who attended the first day of the workshops stressed the role that community leaders can play in motivating members of their communities to register for MOOCs and in supporting the MOOC students in various other ways including providing study venues and in promoting MOOCs as a way of uplifting a community. It is important to include leaders from the communities, including traditional leaders, in discussion about the needs to MOOC students.

MOOC Content Provider

Many MOOC platforms simplify quality control by selecting MOOCs from carefully selected MOOC providers and designing and managing the platform themselves. MOOC portals or MOOC ecosystems that interface with several MOOC platforms will have to select those carefully in order to reduce risk.

While having a small group of preselected and assessed MOOC provider partners is the easiest option it may not meet the needs of developing countries – particularly if they want to promote local ownership and new career opportunities.

7.4.8   Resources

Staff

This is a major need to be able to improve the ICT support in institutions offering MOOCs as well as the need for new people to fill positions that have not existed previously. These may include people who coordinate and consult with role players outside the institution (see sections 7.4.5 to 7.4.7), those who assess the need for new MOOCs or MOOC platforms; who evaluate MOOCs submitted for consideration; MOOC content developers; or assess the success or impact of a MOOC on teachers and on students. They all need training.

However, the MOOC ecosystem and the SA MOOC portal will need to find specialists in block chain technology, systems design, portal design, and in monitoring and evaluating each of the components of the ecosystem and in doing research on the uptake, mutual recognition of MOOCs and other aspects of the ecosystem.

Support Roles

As was the case under Staff above, the support services (MOOC accreditation, career guidance and learning pathways, student mentoring or wrapping, student administration) will need to have suitable staff to fulfil the roles needed.

Government Finance

The financing of such an endeavour will need a multi-stakeholder approach (Colucci, Muñoz and Devaux 2017, 101) and the extent of the resources provided by any one group will have to be negotiated. However, it expected that there will be a need for Treasury and the South African taxpayer to contribute.

Return on Investment

The investment required falls under Government Finance to some extent, but the point is made that education leads to a better economy and creates jobs. Hence, this should be seen as an investment in the future.

7.4.9   Features

Platform Functionality

This is a fundamental aspect that was implied by the need to add value (Section 4.4.4). It will be explored further in Section 8.7. As an overview, it is proposed that there be opportunities for many different, but approved, service providers to contribute a variety functions as participants in the ecosystem.

Recognition

The need for recognition of the certificates by employers and other educational institutions was identified as the most important factor before the research project began. Consultation and collaboration with these groups and obtaining their active involvement and support emerged during the workshops as an essential requirement. This is associated with (built by establishing) the underlying principles of Ownership and Partnerships, Quality Control (Section 7.4.6), and Measuring MOOC Success (Section 7.4.6).

Technical

The workshop participants noted that technical issues are similar across the world, other than the availability and cost of fast communication channels. One of the workshop participants made the point that the technology is often the focus of attention, but the human and organisational issues are more complex, less easy to manage and have greater impact. Hence, this aspect did not receive a great deal of attention in the workshop (provision of telecommunications infrastructure is also considered to be outside of the scope of the MOOC research project and has already been receiving attention). There was some discussion on the role of AI in participant identification, assessment, and monitoring, but this included everything from current learning management systems administering online quizzes and recording marks for assignments to the use of bots.

Structure

Structure is important to assist in ease of use, learnability and memorability of new computer interfaces. It is also very important in assisting in retrieving information and facilitates understanding. The more complex the overall system is the more necessary structure is. Therefore, the design of the SA MOOC ecosystem portal and other components (MOOC platforms, MOOC and service sites) is very important, and must:

- be self-paced;
- offer student engagement support;
- allow for usability; and
- allow for virtual reality.

7.4.10 Certificate Verification

In order to be fully inclusive, the MOOC ecosystem needs to have a way of responding to employer and other stakeholders' queries about the authenticity of a certificate and whether it is accredited by the SA MOOC ecosystem. As with most of the other requirements, this is a major undertaking that can possibly be outsourced but that is essential if the MOOC certificates issued by the SA MOOC ecosystem are to be recognised. The service could be extended to MOOCs from elsewhere as well (see Section 6.4.3).

Separate certification processes are particularly common to get professional qualifications. Various professional and work sector institutions could be asked to assist with this.

7.4.11 MOOC Student Fit

Perceived MOOC student fit has been discussed throughout the book including in Section 3 of Chapter 4 as a fundamental motivating factor in the decision whether to register for a MOOC. However, characteristics of the MOOC, such as customisable content and interfaces (see the list in Section 6.6), can allow a MOOC to fit the needs of a variety of students. And features of the MOOC ecosystem (see Student mentoring in Section 7.4.3) are also important factors in assisting MOOC students to complete the course.

A related issue is that of customer friendly administration allowing flexible starting dates, soft due dates for assessment, and other ways of accommodating the student's schedule. As is the case for all the enhancements proposed for the MOOC ecosystem, this degree of flexibility comes at a cost; it will add to the complexity of the MOOC ecosystem. Benefits are that it adds user convenience and assessment of achievable goals, and hence, is expected to increase the number of registrations for, and successful

completions of, the MOOC. Evidence of success in the form of registration and successful completion rates can be published as introductory information on the web site and this encourages further uptake. Therefore, customising the MOOC schedule to fit the student's schedule is one of the trade-off decisions that need to be made.

Learning style is associated in some ways with the design of flexibility into the MOOC and MOOC platform and in others with the student's own learning profile. It also fits with MOOC-student fit (see Section 4.6.3).

The survey collected quantitative data that shed light on the students' personal preferences and demographic details (see chapters 2 and 3). MOOC characteristics that are considered desirable can be described in detail for the regulator or accrediting agency which will need a checklist or scoring scheme to assess the suitability of a particular MOOC – a preliminary list is presented in Section 6.6.

7.5   Credibility of the MOOC Ecosystem and Portal

This chapter is concluded with words of warning. The ecosystem described in this chapter is complex and will need a major commitment in terms of resources, and careful design and implementation even if it is developed incrementally.

Section 7.4.5 discusses various aspects of the ecosystem. Collaboration with various stakeholder during the portal design will be needed, but longer term buy-in by these stakeholders and the students will be more difficult to establish. Chapter 4 discusses the behavioural change needed by students when studying online. It also reviews classic theories and advice on change management. The challenge of entrenching new behaviours needs to be addressed here where a system may have cost a great deal to develop and its original champions may no longer be heading the project. The initiative can slowly become unused, outdated and a "white elephant". Steps 7 (Sustain acceleration) and 8 (Institute change) (Kotter 1995) (see Section 4.5.3) address this issue.

Furthermore, this proposed system is by its nature dynamic (see Bureaucracy in Section 7.4.5) and the information being presented to students must also be kept up to date – it will change frequently. If students start to doubt the accuracy, and hence, the value of the advice they are being provided with, they will stop using it. The credibility of the system will be its most important asset and must be maintained.

Chapter 8: The MOOC Ecosystem

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8.1   Introduction

As noted in the first paragraphs of Chapter 1, South Africa has a persistent problem of unemployment. In addition, as is the case elsewhere, there is an urgent need to prepare workers whose jobs are likely to be automated in the next decade for new roles in the economy. Thus there is an urgent need to add to the education and training of a large proportion of the population who have not yet embraced the idea of life-long learning, and who may not have experience with self-regulated learning and who may not be comfortable with the idea of learning online.

The South African Government is actively seeking ways of addressing the problem and looking for ways to "massify education", particularly amongst adults and young people who have left school or tertiary education without the qualifications and skills that are required by employers. This upskilling and reskilling may take place partly or entirely online.

The book has sought recommendations for the South African context as to how the uptake of MOOCs in South Africa be can increased, and how MOOC qualifications can receive mutual recognition at other HEIs.

This chapter serves to integrate the finding of the empirical research used throughout the book. In contrast with the preceding chapters that looked at the themes and incorporated views from both the workshops and the survey, in this chapter all the findings and the recommendations from the workshops are reviewed and then all the findings and the recommendations from the survey are reviewed. This has been done to give an alternative view as the two research processes had diverse groups of contributors and processes.

8.2   The Workshops (Focus Group Discussions)

The research questions for the workshops were restated as follows:

- What, according to the panel of experts, motivates individuals to register for a MOOC?

- What, according to the panel of experts, encourages individuals to complete a MOOC?

- According to the panel of experts, how can the South African Government policies assist in increasing the uptake of MOOCs?

- According to the panel of experts, how can mutual recognition of MOOCs be strengthened and extended?

The mandate for the workshops was to make recommendations for South African Government policy. Therefore, the participants did not spend a great deal of time discussing the need for online short courses. It seems that there was general agreement that there is a need for inclusive online programmes offering a variety of content and that, in many respects, MOOCs address this need although some customisation of content is required for groups of students in communities.

The discussion focussed on how MOOCs and MOOC platforms can become part of a proposed MOOC ecosystem and as a result encourage South African citizens to take up this form of learning. The participants gave reasons for the recommendations made and these reflected their expert opinions about the learning needs of the communities (including those already employed and part of business communities). Also, in addressing why the ecosystem was required, several participants added information as to why current MOOC platforms are not, in their opinion, likely to achieve the changes needed in South Africa in terms of educational growth and skills acquisition. The recommendations are not fully fledged "solutions" to problems but rather highlight aspects that need attention. The primary requirements identified are:

- an alternative learning model with associated systems to support the uptake of MOOCs and to assist students to achieve success; and

- a new MOOC accreditation system.

An awareness campaign and a new regulatory framework were identified as major components of the ecosystem that are to be put in place early in the initiative.

The five principles upon which the proposed SA MOOC ecosystem is built are:

- inclusivity regarding MOOC students including flexibility in terms of multiple options from which a student can choose;

- collaboration between a diverse group of service providers and support groups (with associated principles of establishing ownership and creating partnerships which establish or strengthen opportunities for third party service providers);

- dynamic evolution of the ecosystem – as technology, social and economic circumstances affecting education evolve the ecosystem must adapt;

- feasibility; and

- added value – ensuring that the ecosystem adds value and does not just duplicate existing sites.

There is also a long list of more concrete requirements, both for the introduction of the ecosystem and for its sustainability. These include but are not limited to a long-term plan, resources required, feasibility studies, and systems to initiate and sustain collaboration.

8.3 Findings from the Workshops

There are three major components to the proposed SA MOOC ecosystem and one supporting component:

- the MOOC learning component which establishes the new (alternative) MOOC learning model and incorporates enhanced student support services:

- the new assessment and certification component;

- the new regulatory framework including accreditation; and

- the awareness campaign.

The integration of the components into the SA MOOC system strives to achieve the added value highlighted as the last of the five underlying principles listed in Section 8.2 (derived from Section 7.4.4).

8.3.1 Alternative MOOC Learning Model

As a way of achieving inclusivity, implementation of the new model depends on the availability of enhanced student support services. Therefore, the alternative MOOC learning model may include classroom-based activities, facilitated online group interaction and face to face meetings (blended learning). Support is urgently required by students who cannot cope well with independent or self-regulated learning because they have not experienced this in school classrooms or left school quite a long time ago.

Additional student support services can be provided by third parties or task groups with representatives from several stakeholder groups. The underlying principle is that this is a collaborative and consultative model that creates roles for partner organisations within the ecosystem. A preliminary list of student support services required follows.

Wrapping (Student Support Post Registration)

Wrapping is support that is available to students while they are taking the MOOC. It helps students to achieve their academic goals (to understand the content of the MOOC, master skills, improve their performance in assignments and examinations). It also addresses self-efficacy problems, such as low levels of confidence and fear of failure that hold students back from taking opportunities to study. It is expected to encourage students to complete the MOOC. Examples of sources and types of support are:

- study groups;

- tutoring;

- mentoring; and

- assessment.

This requirement is related to the blended learning option used by Dale and Singer (2019) and the hybrid model proposed by Fidalgo-Blanco, Sein-Echaluce and García-Peñalvo (2015; 2016). Opportunities to do experiential learning alongside MOOC are recommended particularly for vocational training as this is a way of bridging the gap between 'book learning' and developing the practical skills that are valuable in the workplace. Practical experience, workshop sessions or time doing experiments in a laboratory are needed for many courses that are of interest to people who want to enter the job market as artisans or tradespeople and for some university courses (e.g. chemistry, physics, engineering and health sciences have laboratory or workshop based practical sessions). Hence, a way is needed to make hands-on practical sessions possible. Solutions to this challenge are not offered here but South African universities, and in particular the universities of technology, do arrange internships and work integrated learning (WIL) programmes. Management and co-ordination are needed to facilitate:

- set tasks (practical exercises);

- learnerships; and

- community service/volunteer programmes.

Online Student Administration

Easy access to information, such as student records, and user friendly, efficient and effective processes (e.g. registration processes and the new certificate verification processes) should be amongst the "low hanging fruit" offered early by the MOOC ecosystem. These services are not unusual – many MOOC platforms do this well and they may already be in place if the MOOC is accessed via an existing platform. Flexibility with respect to scheduling is also found in many systems and once again might be available for some MOOCs. Privacy of student records and security related to certification are standard features for online systems.

8.3.2   New Assessment and Certification Procedures

Credible computer-based or mobile assessment of students must be done if credible certification is to add value to the system. Future activities need to include investigations into the effectiveness of recent computer-based assessment systems that are currently used for a variety of subjects. These evaluations are aimed at finding ways to reduce the costs of certification (including the cost to the student of attending an examination, cost of administering and marking tests but also of monitoring online testing to prevent cheating). This supports both dynamic evolution of the system and its feasibility.

8.3.3   New Regulatory Framework

Regulatory functions need to be managed by joint task groups with members drawn from many sectors, to build the credibility of the MOOC ecosystem (this is discussed in detail in Chapter 7). This is needed for increasing the uptake of MOOCs by potential students *and* to initiate and sustain recognition of MOOC qualifications by employees and other HEIs (achieving the principles of collaboration, ownership and partnerships). This framework and its corresponding processes should be designed to minimise bureaucratic delays and therefore the recommendation is that its focus be limited to:

- assessment of MOOC content and MOOC platforms (evaluation in response to applications submitted by many MOOC suppliers) using a published list of MOOC criteria and resulting in accredited/recommended MOOCs and platforms which would be listed on the site; and

- ongoing evaluation and monitoring of the MOOC content and MOOC platforms.

8.3.4   Awareness Campaign (On-line and Off-line)

Inclusivity can only be achieved if the entire population is made aware of the options available for improving work-related skills, particularly the benefits of studying online and the MOOC courses that are available. The campaign would seek to communicate with many interest groups including:

- prospective students;

- employers;

- professional and industrial boards;

- traditional educational institutions

- MOOC providers; and

- those interested in developing skills for the development and operation of MOOCs.

The campaign would need to have customised programmes that address the needs of these stakeholder groups in an effective way.

Associated with the awareness campaign there should be online career guidance:

- pre-registration assessment of prospective students;

- learning pathways (linked, recommended MOOCs that allow the student to build on existing knowledge and skills to achieve a level of knowledge and skills appropriate for a particular career or role).

8.4   The Proposed SA MOOC Ecosystem
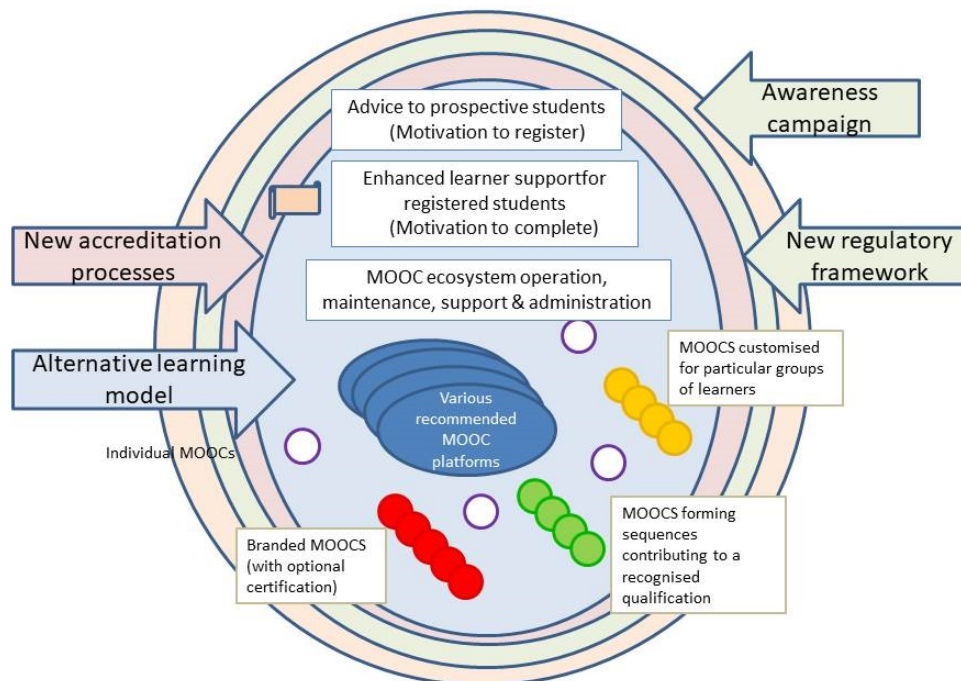
Figure 8-1: The components of the proposed SA MOOC ecosystem

Figure 8-1 illustrates the components of the proposed SA MOOC ecosystem. It also requires a "central ecosystems unit" not shown here, but which oversees the entire SA MOOC ecosystem. The role of the central unit is to communicate with and between, coordinate and regulate the many different partners envisaged as service providers within this framework. The location of this unit within one or more Government departments or as an independent institution will need to be negotiated. The purpose of this evaluation and monitoring unit is to stabilise the system and achieve the feasibility highlighted as one of the six underlying principles in Section 7.4.4.

The outer rings indicate major components of the proposed SA MOOC ecosystem:

- a new (alternative) MOOC learning model;
- new accreditation procedures and processes;
- an awareness campaign; and
- a new regulatory framework.

An additional component of the managing unit is needed to raise and manage funding:

- cross-sectoral funding to make the development of such MOOCs possible.[22]

The enhanced student support services are part of the alternative MOOC learning model. Several separate MOOC platforms and individual MOOCs are shown as being accessed from that learning component of the ecosystem.

8.5 Recommendations from the Workshops

Recommendation A: The design, implementation, adoption and evolution of a MOOC ecosystem accessed via a portal

Recommendation B: Components of the MOOC ecosystem

Recommendation C: Management and control of an ambitious project

8.6 The Survey

The survey allowed the researcher to understand who the potential MOOC users are and to use the answers provided to the questions by different groups of respondents to answer the research questions:

- What, according to potential MOOC students, would motivate them to register for a MOOC?

- What, according to potential MOOC students, would encourage them to complete a MOOC?

- According to potential MOOC students, how can the South African Government policies assist in increasing the uptake of MOOCs?

- According to potential MOOC student, how important is it that mutual recognition of MOOCs be strengthened and extended?

The research data was obtained from potential MOOC students using an extensive survey carried out in all nine provinces of South Africa and using quota sampling. Data was collected from 3 147 respondents.

A survey gives quantitative results that include the numbers of respondents in different categories, for example, the number of unemployed people in one particular province. The strength of surveys is that the results may be generalisable if a sufficiently large sample is obtained and a sound sampling technique is used to select the respondents.

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[22] The cross-sectoral funding is not shown as part of the MOOC ecosystem in Figure 8-1 as it goes beyond the ecosystem, but it is proposed that this recommendation be built into policy.

However, the analysis of this set of data indicates that the full sample has several subgroups and care must be taken not to over-generalise.

The questionnaire was designed to ascertain the requirements of respondents regarding MOOCs and MOOC platforms. Most of the questions were worded to obtain information about personal preferences regarding what MOOCs or MOOC platforms could or should offer and provide information in terms of what is needed rather than how this can be achieved. There is only one section that asks more directly what respondents would like some other agency, whom they have little control over, to do, namely, Section E: Government's role. However, the questions in this section are limited, are stated very briefly and offer simple options.

The weakness of a survey as a way to inform policy is particularly evident from the answers offered in Section E. Except for the questions which required more insight (regarding subsidising bridging courses and rewarding institutions based on completions rates), approximately 90% of respondents agree or strongly agree that Government should play a coordinating and managing role regarding MOOCs. The two questions noted above still had an 80% agree or strongly agree response. However, the survey could not suggest in any amount of detail how these goals could or should be achieved or explain why or unpack or add to the statements offered as options.

8.7   Findings from the Survey

The sample was as expected.

The respondents in different demographic groups have significantly different profiles in terms of their HLE; whether they are currently studying; their employment status; and their internet access. However, there were no marked differences between males and females regarding access to and uptake of education (HLE, whether they are currently studying).

- Targeting the Not studying and the Unemployed group may be a strategy to consider.

- Limpopo, Western Cape and Northern Cape have a disproportionate number of people Not studying (72.2%, 71.4% and 72.5%, respectively). Western Cape and Limpopo also have surprisingly low unemployment. Is there a connection? This raises the need for further, future investigation.

- Currently, previous registrations for online short courses are highest in Gauteng and lowest in Northern Cape, Eastern Cape and Western Cape. The reasons for this are unclear and this would be an interesting and relevant line for future research.

Although the analyses of the most frequent internet access method overwhelmingly pointed to mobile devices, those who had completed short online courses in the past

selected public venues as equally important. Hence, Telecentre/Community centre (23.6%) and Workplace (21.9%) were popular options while own mobile (15.7%) and friend or relative's house (16.3%) were the least popular. This is an important set of findings. Whereas internet access via personal devices, such as smart phones, for entertainment or social networking and communication may be extremely popular, this set of results indicate that it may not be as useful for studying online courses.

Accreditation of MOOC courses by South African authorities, recognised by employers and by other institutions, such as HEIs, were found to be important. Between 80% and 90% of respondents agreed or agreed strongly that this was the case.

Previous experience in registering for and completing short online courses provided interesting statistics: 32% percent of respondent said that they had at some time registered for such a course and 23% claimed that they had completed such a course. Therefore, it seems that 71% of those who said they had registered for such a course claimed that they had received a certificate. Of those 713 respondents who completed a course presented entirely online, 417 (58%) did a UNISA module.

The respondents all agreed strongly that Government needs to do everything listed in the questionnaire.

The separate groups of questions in the Motivation to register for a MOOC section of the questionnaire were Accreditation, MOOC functionality, MOOC accessibility, Interaction with other people, and Personal characteristics of the student. It was found that the groups were distinctly different and only weak associations could be found between them. Each of these concept groups may have a strong association or relationship with a central concept, namely, intention to register for a MOOC, but this was not demonstrated as no data was obtained for this central concept. Therefore, a model cannot be built, and the conceptual framework cannot be confirmed entirely, even though the individual concepts have been shown to be viable.

The concept groups for the section of the question for Motivation to complete a MOOC are: Persistence; Motivators/Rewards; Self-efficacy; Support External; Institutional Support

As in the case of Motivation to register for a MOOC, associations between the concept groups were weak, but it is considered likely that each of these concept groups have a strong association or relationship with a central concept, namely, intention to complete a MOOC.

8.8 Recommendations from the Survey

8.8.1 Addressing the Needs of Diverse Groups

Recommendation D1: Either the policy must incorporate a single strategy aimed only at those groups most in need of assistance in accessing, encouragement to register and support to increase completion rates.

OR

Recommendation D2: A very flexible approach, allowing for multiple needs to be addressed, will be required.

Recommendation E: Investigate strategies to motivate the potential MOOC students further by carrying out ongoing research.

Recommendation F: Prioritise the needs and strategies to guide the action plan of work that Government needs to undertake to promote and maintain the uptake of MOOCs – this needs to be done by a team of experts.

8.8.2 Review of the Principles

Added Value

The Added value principle is embodied in two recommendations:

Recommendation A: The design, implementation, adoption and evolution of a MOOC ecosystem accessed via a portal

Recommendation F: Prioritise the needs and strategies to guide the action plan of work that Government needs to undertake to promote and maintain the uptake of MOOCs – this needs to be done by a team of experts.

The SA MOOC ecosystem should be designed to make optimal use of existing services offered by MOOC content developers, existing MOOC platforms, certificate verification services, recruitment services and other related services. Many of these will be operating in the private sector and will charge for their services. However, provision of these services will always come at a cost and it is cheaper and more efficient to use service providers who can demonstrate that they already provide most of the services required than to contract people to replicate such services. The value added by the portal is that the services are evaluated and monitored before they are included in the portal and are endorsed. The provision of a single portal allows the services to be visible in one place and shows how they complement one another. Since the existing service providers are invited to become part of the ecosystem, the challenges related to competing sectors are expected to be reduced. Where the South African MOOC students

need services or customised content that is not already available, new services can be added.

Inclusivity

The main goal of the proposed SA MOOC ecosystem and the associated recommendations is to achieve *inclusivity* by allowing prospective MOOC students maximum control over what they learn, when and how they learn it.

The survey showed that the sample population was made up of distinct groups who differed in terms of the educational levels they had reached, whether they were studying currently, their previous experience studying short courses entirely online, and their current employment status. The percentages of people in each category were calculated; this can inform policy development by highlighting priorities and can be used in cost benefit studies. The educational needs of subgroups within a larger group (e.g. the needs of fully employed people compared with those who are employed part time or those who are unemployed) are different. Hence, a range of options is needed, such as MOOCs covering different topics and suitable for students at several levels of education, and a variety of student support services that can be adapted to the needs of different groups. MOOCs could have different interfaces (including interfaces in different languages or intended for visually challenged users). This means that the ecosystem must allow for many options and must be accommodating and flexible.

This is embodied in the first of the underlying principle from the workshops, namely:

- *Inclusivity* (accessible and welcoming as many students as possible)

This is supported by the linked recommendations from the survey:

Recommendation D1: Either the policy must incorporate a single strategy aimed only at those groups most in need of assistance in accessing, encouragement to register and support to increase completion rates

OR

Recommendation D2: A very flexible approach, allowing for multiple needs to be addressed, will be required.

The Need for the System to Evolve

The need for the system to evolve is covered by the third principle, namely:

- *Dynamic evolution* (allowing the system to evolve)

Recommendation C with its subsections supports this principle.

Recommendation C: Management and control of an ambitious project

An incremental or phased approach to its construction and adoption is recommended.

The overall system is expected to evolve over time.

Its effectiveness and its ability to respond to rapidly changing technology and changing societal needs require a properly executed monitoring and evaluation process

It needs to be supplemented by a comprehensive and creative research component.

Detailed recommendations regarding strategies, tactics or action plans are not provided. Recommendation E endorses and emphasises the last subsection included in Recommendation C.

Recommendation E: Investigate strategies to motivate the potential MOOC students further by carrying out ongoing research.

Collaboration

Role players in the MOOC ecosystem were described in detail during the workshop. The fourth principle, *collaboration* (between many service providers, the Government, and beneficiaries such as employers), was a recurring theme.

The warning made by Boga and McGreal (2014) against national MOOC policies that lock the country into one MOOC platform and which exclude participation by local partners and partners from different types of organisation are addressed in the findings and recommendations as matters of *collaboration*, *ownership* and *partnership*.

Recommendation B: Components of the MOOC ecosystem and the referred to stakeholders and a collaborative and consultative model

Feasibility

Feasibility is one of the principles identified earlier. The suggestions made by workshop participants will need to be critically evaluated regarding cost, resource availability and urgency. The proposed inclusive, collaborative SA MOOC ecosystem model is the major outcome of this part of the research project, but it is recognised that full implementation will be a daunting, expensive, long-term project. An associated point is that MOOC content creation costs are high, thus there is a tendency to use existing content. However, this might be short sighted as the initial costs may bring about good returns for many years. Human development is generally expensive and in the

traditional model many of those costs are repeated every year. Cross-sectoral funding is needed to make the development of such MOOCs possible.[23]

Feasibility studies are included in Recommendation C.

Recommendation C: Management and control of an ambitious project

8.9   Limitations of the Research and Suggestions for Future Research

Recommendation E relates to the need for ongoing research. The principle of dynamic evolution of the SA MOOC ecosystem has this as a fundamental process as well. The suggestions for future research made throughout the book arose from questions from review of the results and is also an acknowledgement that a full literature review was not undertaken. The COVID19 pandemic of 2020 occurred when the book was being written and triggered new ideas regarding lessons learned at that time. Table 8-1 summarises the suggestions for future research made in the chapters of the book, but this is not a comprehensive list of all possible research required. The reader may well identify other aspects that need further clarification and there is certainly existing research on associated topics. Many of the items in Table 8-1 have been stated in the recommendations.

Table 8-1: Future research

Initiated in	Description	Further comment
	MOOC research that recognises context	This is an overarching requirement. It was the opinion of the participants in the workshops that there is an over-focus on certain aspects of MOOCs in published research compared with others. This dominant focus might be of partial interest to South Africa or might be a result of what media chooses to focus on. This study throws light in a balanced way on different aspects of MOOCs that require consideration.
Literature	MOOC content providers	Some large MOOC platforms resist including MOOC content from less well-known partners as the reputation of the partners is an important factor in the acceptance and recognition of the MOOC platform as a whole. The impact of this on the MOOC SA ecosystem needs to be ascertained. (New research)
	Impact studies	A baseline study is needed at the start of the SA MOOC ecosystem initiative, and the impact study should be repeated annually (or at regular intervals) while the evolution of the intervention is also noted. Existing baseline studies are not aligned with this

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[23] The cross-sectoral funding is not shown as part of the MOOC ecosystem in Figure 8-1 as it goes beyond the ecosystem, but it is cross-sectoral funding proposed that this recommendation be built into policy.

		project. (New, longitudinal research project)
	Different versions of a MOOC	Different versions of a MOOC may be required for formal study and informal study. These may be included in a learning pathway but may also be accessed individually by students who only want to register and complete the one MOOC. Future research could compare the popularity and "success" of the various versions. (New research)
Chapter 2	Analysis of the survey data	The analysis of survey data was not exhaustive; there are many possible combinations data from groups of questions and issues requiring attention. The opportunity exists for other researchers, including those participating in "hackathons", professional statisticians and other researchers to continue the analysis by looking for interesting relationships in the data collected.
Chapter 3	Highest level of education	The questionnaire did not ask what the *completed* HLE was, thus the results were ambiguous. Future research should consider rewording this question. (Needs to be confirmed.)
	Not studying versus low unemployment	Some provinces in South Africa had a disproportionate number of people not studying as well as low unemployment. Is there a definite connection here? (Needs to be confirmed.)
	Previous registrations for online short courses	One province in South Africa had a noticeably high registration for short online courses while three others reported a noticeably low take-up of such courses. Why is this the case? (Needs to be confirmed and reasons sought.)
Chapter 4	Correlations between constructs (dependent variables) relating to motivation to register for a MOOC	Can the questionnaire be improved? Can the existing data yield more informative results? (Needs to be confirmed.) Although the p-value is zero in all cases, the Pearson's Correlation values are low between the following: Accreditation and the other groups Registration and the other groups Personal and the other groups Personal and the MOOC advantages Personal and the Registration group
Chapter 5	No significant difference between gender and reported completion of online short courses	Needs to be confirmed
	Motivation to complete, Correlations between constructs (dependent variables) were	Needs to be confirmed – can the questionnaire be improved? Can the existing data yield more informative results? Although the p-value is zero in all cases, the Pearson's Correlation values are low between the groups of questions (i.e. Persistence, Motivators/Rewards, Self-

	insubstantial	Efficacy, External Support, Institutional Support).
	Alternative models of learning	The workshop participants were in favour of exploring the feasibility, sustainability and evidence of efficacy of mixed models.
Chapter 6	Online assessment	Look at new publications reporting on recent experience of online assessment during the COVID-19 lockdown periods and how it affects MOOC certification processes.
Chapter 7	Customised MOOC content	Cost implications need careful review but there is existing research.
	Review usability and HCI studies	A comprehensive review of studies that have observed students as they studied using a MOOC was not done; thus, one should be undertaken in future.
	Fields of study	Find out why certain fields are chosen by asking respondents to link them to a future career or job opportunity.
	An evolving system based on research	The SA MOOC ecosystem is expected to evolve over time. Its effectiveness and its ability to respond to rapidly changing technology and changing societal needs all require a research component.
	What Government should do?	A future questionnaire might gather more useful information with more probing questions from the citizens.
	MOOC accreditation	MOOC characteristics that are considered desirable and these could be used by the regulator or accrediting agency as a checklist or to create a scoring scheme to assess the suitability of a particular MOOC

8.10   Conclusion

8.10.1   Are International MOOCs Fulfilling the Needs of African Students?

Measures of success and other concepts vary depending on the research methodology used, how data is collected and what data is collected. MOOC students completing a survey may say that they were satisfied with a MOOC even if they did not complete it and did not obtain a certificate of any sort. Their reasons vary but might include that they found it interesting and that was the only reason for taking the module; it was relevant to their work, and hence, in their opinion it would increase their insight into work related issues and possibly improve their performance and, possibly, a proof of mastering the content in the form of a certificate was not necessary; or even in some cases if they dropped out of the course early but the reasons were unrelated to the course itself.

However, in the case of addressing unemployment these reasons generally do not apply, and as indicated in both components of the research project, obtaining a recognised qualification is important.

Obviously, the person must register for the course and complete it attaining a prescribed level of knowledge to obtain the qualification. The data currently available is that reported in the literature, which in most cases includes all MOOC students globally. The completion rates obtained from the automated data collection are reported low (approximately 7% of those who register for a MOOC complete it). This is not reflected in the data collected for the research project as it requires access to data sets from many different MOOC platforms as well as identifying where students come from.

Adam (2019) argues that dominant MOOCs are Western-centric and they erode local and indigenous knowledge systems.

8.10.2   Recommendations

The workshop participants supported the view that additional support structures are required to assist potential MOOC students in selecting a suitable course or a learning pathway consisting of more than one course (this is met by the awareness component of the MOOC eco-system). They also considered it important to provide student wrapping to assist students who are registered to complete the course – this is the essence of the new (alternative) MOOC learning model. The model proposed has features of a cMOOC but with some features and services offered by third part organisations and not by the learning community. The proposed SA MOOC ecosystem itself is not presented using any social networking system but it does propose accessing multiple learning spaces, tools, and technologies if these are part of the MOOC platforms and individual MOOCs accredited by the system.

A need for new accreditations procedures and processes was identified. These are expected to encourage the recognition of MOOC qualifications by employers and by HEIs. The processes include recognising the certificates issued by previously accredited MOOC platforms or MOOC developers or individual MOOCs; evaluating and accrediting new MOOC platforms, MOOC development groups and individual MOOCs on request and to monitor and re-evaluate these regularly; validating certificates submitted by individuals.

A proposed regulatory framework underpins the accreditation procedures and processes to an extent. However, it is not only tasked with developing and putting regulations in place. It has an ongoing operational component which is likely to focus on promoting the five principles of inclusivity, collaboration, dynamic evolution, feasibility and added value.

8.10.3   Answering the Four Research Questions

The over-arching research question was: How can the uptake of MOOCs in South Africa be increased, and how can MOOC qualifications receive mutual recognition at other HEIs?

Consolidated Research Questions:

- What motivates individuals to register for a MOOC?

The research data from both components ends up saying "that depends …" There is no single, homogeneous group. This issue is addressed by the MOOC ecosystem that is designed to provide awareness campaigns, many learning pathways, comprehensive career advice, options to try out a programme before committing to it and other pre-registration information. All of this should be accessible from the MOOC portal (one-stop shop).

- What encourages individuals to complete a MOOC?

The same problem is addressed here – there is no single, homogeneous group. The MOOC ecosystem should be designed to evolve and provide a multiplicity of services to the registered student including support from administrators, the system, tutors and peer, content and MOOCs designed to cater for different learning styles and topics. Such a 'good fit' in terms of content, learning approach and support will assist many different groups of students to complete the course.

- Government's role: How can the South African Government policies assist in increasing the uptake of MOOCs?

The surveys agreed that Government can and should play a coordinating and managing role. The workshops explained what this entails, acknowledged the difficulties involved and stressed the view that a single, "off-the-shelf", international MOOC platform is unlikely to "solve the problem".

- Accreditation: How can mutual recognition of MOOCs be strengthened and extended?

The survey participants clearly indicated that this would be a major motivation both for registering and for completion. The workshop participants proposed an entirely new, MOOC eco-system component to implement a new accreditation system for MOOCs.

8.10.4 Contribution to Theory

The MUM was proposed as a theoretical basis which could be used for the identification of groups of concepts and the analysis of data. It proposes that four "dimensions" are involved in the uptake of MOOCs (i.e. personal, interpersonal, environmental and technological) and MOOC concepts are categorised within those dimensions. It proved useful in justifying the use of mixed method research.

The five principles upon which the proposed SA MOOC ecosystem is built are:

- inclusivity regarding MOOC students including flexibility in terms of multiple options from which a student can choose;

- collaboration between a diverse group of service providers and support groups (with associated principles of establishing ownership and creating partnerships which establish or strengthen opportunities for third party service providers);

- dynamic evolution of the ecosystem – as technology, social and economic circumstances affecting education evolve the ecosystem must adapt;

- feasibility; and

- added value – ensuring that the ecosystem adds value and does not just duplicate existing sites.

The proposed SA MOOC ecosystem has not yet been accepted by the sponsors of the research project. Therefore, its viability and effectiveness cannot be tested, and the contribution remains theoretical.

8.10.5 Complex Systems

A word of warning: Technology often promises low cost solutions but unfortunately this is a naïve view particularly when a proposed system is complex. The complete system involves far more than just technology, it is rarely low cost, and it is not a "silver bullet" – the use of the word "solution" is almost always ill-advised.

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Addendum A: Literature Review Table

Author/s	Theory	Constructs / Concepts – Abstracts in some cases	Research methodology	Research paradigm	Comments
Boga and McGreal 2014	None	Disruptive technology (MOOCs); Access to digital technologies, language and culture, certification, mobile learning			Report – contract research for Commonwealth of Learning; Discussion on African problems with MOOCs
Brunton et al. 2017	None	Readiness; Enough time; Computer skills; My first assignment	Qualitative	Interpretivist	Conference paper – European Conference on Massive Open Online Courses e-MOOC '17
Castillo et al. 2015	Social Cognitive	Expanding inclusion access, infrastructure, sustainability; Accreditation; Government collaboration, motivation, opportunities (employability)			Journal paper – For development
Czernie-wicz et al. 2017	Activity	Openness (practices, technical, legal, cultural, pedagogical, financial)	Mixed methods (Qualitative and quantitative)	Ethnographic Interpretivist – talks of small number of observations etc.	Journal paper – Experience in Africa
De Rosa, Ferrari and Kerr 2017	None	Learning experience (interactive tools, video materials, blogs, MOOCs' features); We are unable to say whether MOOCs are really a desirable learning experience;	Quantitative	Positivist	In European Conference on Massive Open Online Courses (pp. 20-28). Springer

		Factors for success in the MOOC environment; Learner engagement and participation as activities that ensure a higher completion rate and a satisfying learning experience; Participation is a request that learners find unsustainable; Difficulty providing generalisable results			
De Santis et al. 2019	None	Digital competence, reason for enrolling, reasons for withdrawing, employment; In the Italian university context, within a project funded by the Italian Ministry of Education, University and Research (MIUR) for an extraordinary intervention; The MOOC platform is made up of 17 Italian universities and a set of selected partners; The network is open to the access of other universities and institutions, associations of scientific and cultural relevance; Registered users are about 50 000 (February 2019); Till now, 208 courses and 26 pathways (training courses dedicated to the construction of complex knowledge and composed by multiple MOOCs and intermediate and final assessments) were produced; At the completion of each course the user acquires an attendance certificate and an open badge (currently distributed by www.bestr.it); Moreover, users can acquire ECTS	Qualitative	Interprevitist	Conference paper – European Conference on Massive Open Online Courses

		by attending EduOpen MOOCs: there are two Professional Masters and some curricular courses that provide academic credits for learners that formalise the enrolment at the reference universities of the network.			
Dhorne et al. 2017	None	Mentoring; Lack of time; Personalised support	Quantitative	Positivist	Conference paper – European Conference on Massive Open Online Courses e-MOOC '17
Garrido et al. 2016	Social Cognitive	Income; Education; Motivation;, Personal fulfilment	Mixed method (Qualitative and Quantitative)	Positivist and Interpretivist	Report plus questionnaire; No evidence of a publication on this
Hamori 2017	None	Employability; Employment support; Employer loyalty	Quantitative	Positivist	Conference paper – European Conference on Massive Open Online Courses e-MOOC '17
Jiang et al. 2014	None	Sex; Grades (reading, writing, maths); Performance	Quantitative	Positivist	Journal paper
Kopp, Gröblinger and Zimmer-mann 2017	Connectivism	Openness of MOOCs, OER			Conference paper – European Conference on Massive Open Online Courses e-MOOC '17
Launois, Allotey and Reidpath 2019	None	Language, level of education, reason for taking MOOCs; Learner engagement	Qualitative	Interpretivist	Journal paper

Liyanagu-nawarden, Adams and Williams 2013	Connectivism, Activity	Barriers (technological, linguistic), mLearning, motivation, accreditation			Literature review
Liyanagu-nawarden, Williams and Adams 2013	Connectivism, cognitive behaviourist	Language and culture, infrastructure, digital technologies, re-use, access			Journal paper
Henderikx Kreijns and Kalz 2017	Reasoned Action Approach, Activity	Interaction, instant feedback, instructor presence, useful feedback, tech. skills, insufficient academic background	Qualitative	Interpretivist	Conference paper – European Conference on Massive Open Online Courses e-MOOC '17
Moneta 2004	Social Cognitive; Self-determination; Flow	Creativity, intrinsic motivation, extrinsic motivation, self-worth, interest, involvement, enjoyment	Quantitative	Positivistic	Journal paper
Nesterko et al. 2013	None	Using the example of learner population of 18 courses offered by HarvardX, Harvard's division for online learning, we formalise the process of evaluating the geographic data of MOOCs regarding enrolment and certificate attainment. We report the absolute counts of learners from various countries and relate them to baselines.			Conference paper – 2013 NIPS Data-driven Education Workshop
Rohs and Ganz 2015	Knowledge Gap	Growth in knowledge, socio-economic status (communication skills, existing knowledge,			Journal paper

		social contacts, employment, education level, household income), time; Access gap (access to internet, digital divide), usage gap (way that technology is used), reception gap (information literacy)			
Tariq, Mubeen and Mahmood 2011	Goal Orientation	Intrinsic motivation (curiosity, desire urge, want, self-regulation); Extrinsic motivation (reward, gaining fame, certificate); Punishment; Goal orientation	Quantitative	Positivist	Journal paper
Tracey, Swart and Murphy 2018	Connectivism, Cognitive Behaviourist	Motivation, interest, general interest, pre-course interest, pre-course motivation, post-course reactions, certificate intentions, industry experience, employment, intention to earn	Quantitative	Positivist	Cornell Hospitality Report but a UNISA co-author
Woldegiy-orgis and Carvalho 2015	Connectivism	cMOOCs, xMOOCS, Revenue, certification, quality			Conference paper – 13th International Conference on African Private Higher Education

Addendum B: Questionnaire

Section A: General Information

A.1. What is your gender?

Male	Female
1	2

A.2. Which racial group do you belong to? *[This is only for statistical purposes]*

Black	White	Coloured	Indian	Others
1	2	3	4	

A.3. What is your year of birth?

A.4. What is your highest education level (Only indicate the highest)?

No formal schooling	Primary school *(Completed Grade 5 / Standard 3)*	Middle School *(Completed Grade 10 / Standard 8)*	High School *(Passed Matric or equivalent)*	College *(Technical, FET)* or *(Obtained a post matric diploma or certificate)*
1	2	3	4	5
University Bachelor's *(Graduated)*	Post-graduate diploma or Honours *(Graduated)*	Master's	PhD	
6	7	8	9	

A.5. This year, are you studying?

Full time	Part time	Not studying
[1]	[2]	[3]

A.6. Which one of the following best describes your employment status? (You are employed if you are receiving payment for the work you are doing.) [Select only one]

Currently unemployed [1]	Employed part time (receive weekly wages or a salary by one or more employer) [2]
Have never been employed [3]	Employed full time (receive weekly wages or a salary from an employer) [4]
Occasionally employed (not regular employment) [5]	Retired [6]
Self-employed part time or full time [7]	

A.7. Where do you access the internet most frequently? [Select only one]

Do not access it at all [1]	Friend's / Relative's house [2]	School / University or NEMISA CoLab [3]
Home or on my own mobile device [4]	Cyber cafe / Internet café [5]	Free Wi-Fi zones including a public library [6]
Telecentre / Community centre [7]	Workplace [8]	Other [9]

Section B: Accreditation (Officially Recognised) and Screening Questions

To what extent do you agree with the following statements?		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
AC C1	I will take a course if it is accredited by a recognised and authorised South African agency.	1	2	3	4	5
AC C2	I will take a course if my employer or other agencies recognise it for promotion purposes.	1	2	3	4	5

AC C3	I will take a course that is accredited by a non-South African institution.	1	2	3	4	5

Screening Questions

SC1.

For each of the following statements, indicate whether it is True or False:		True	False
KN1	You can study using a mobile phone	1	0
KN2	Online course are courses where you must use a mobile phone or a tablet computer or some other type of computer	1	0
KN3	Online course are courses where you can use paper and a pen to complete this kind of course	1	0
KN4	The internet is used to find information from many places around the world	1	0
KN5	The internet is used only to make telephone calls using a mobile phone (cell phone)	1	0

SC2. In the past ten years, have you taken any education or training course that lasted longer than one day?

Yes (1)	No (2)	Not sure (3)

SC3. Do you think you will take any education or training course that will last longer than one day in the next five years?

Yes (1)	No (2)	Not sure (3)

MOOCs' Desirable Features

The following are some MOOC features.					
How important is this feature of MOOCs to you?	Very unimportant	Not important	Neither important nor unimportant	Important	Very important

FTR1	I can learn at my own pace.	1	2	3	4	5
FTR2	I can download the videos and other materials for the class to my own mobile device/computer.	1	2	3	4	5
FTR3	I can arrange my learning activities based on my ability and needs without strict deadlines.	1	2	3	4	5
FTR4	I can learn the course interactively (do exercises and not just reading).	1	2	3	4	5
FTR5	I can learn together with my peers for example through discussion forums, wikis, meet-ups, etc.	1	2	3	4	5
FTR6	I can easily see how the course is structured.	1	2	3	4	5
FTR7	I can access a large variety of courses	1	2	3	4	5
FTR8	I can enrol with no minimum educational requirements, e.g. matric	1	2	3	4	5
FTR9	This would assist me in improving my knowledge in my favourite subject	1	2	3	4	5
FTR 10	The course is free or has low study fees	1	2	3	4	5
FTR 11	No prescribed textbooks are needed, all study material is online	1	2	3	4	5
FTR 12	There are no assignments that have to be handed in and no deadlines	1	2	3	4	5

I would register for an online course if:		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
REA 1	My circumstances demand that I must improve my knowledge.	1	2	3	4	5
REA 2	I will be supported by people I associate with.	1	2	3	4	5

Section C: Motivation to Enrol for (Register for) MOOCs

A MOOC is a formal course that you can only access online; usually it is short (not longer than three months) and the student does not get very much personal attention from a tutor or lecturer. MOOCs have large numbers of people doing them. Often many MOOCs for different topics can be found together on a MOOC platform.

Experience with different forms of learning (registration)		Yes	No
REG0	I have at some time registered for a course, part of a course or a module presented entirely online	1	0

Experience with different forms of learning (completion)		Yes	No
CPL1	I have at some time completed a course presented entirely online	1	0
CPL2	I have at some time received a certificate for a course presented entirely online	1	0
CPL3	I have at some time completed a module through UNISA	1	0

*(These questions are asking what things are **important** to you and that might influence you to **start** a MOOC.)*

To what extent do you agree with the following statements? **I would seriously consider registering for a MOOC:**		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
PER1	Because I like studying new topics; life-long learning is part of my life					
PER2	Because I like being in control of my own learning					
PER3	Because I like being able to repeat sections of material until I am sure I have mastered them					
PER4	Because I like studying on my own					
PER5	As I am competent in the use of mobile devices such as smart phones, tablets or laptop computers					
PER6	As I know that I have enough background knowledge for the course I want to take					
PER7	If I think I have enough time to do the work					
REG1	If I will mark my peers' assignments and they mark mine					

RE G2	If I receive quick feedback for submitted assignments					
RE G3	If I can be placed with learners that work at my pace					
RE G4	If some materials are written in more than one language					
RE G5	If I can be assisted in closing the gap between what I know and what I should know for a course					

Barriers to Studying through MOOCs

I want to study an online course. However, in the area where I live: *[Mark all those that are applicable to you]*		
BAR1	We do not have internet	1/0
BAR2	We have problems with electricity (electricity is frequently off for more than 8 hours or even days)	1/0
BAR3	I have to travel far to access the internet	1/0
BAR4	The available internet is too slow to download big files	1/0
BAR5	I sometimes need access to face-to-face help accessing the internet i.e. ICT support	1/0
BAR6	It is difficult to communicate with the lecturer	1/0
	Any other reasons _____ _____	

If you were going to study a MOOC for which field would enrol? *(Indicate at most one or two choices)*		**First choice**	**Second choice**
FLD1	Science, technology, engineering or mathematics		
FLD2	Life sciences (medicine, agriculture, i.e. anything to do with living things)		
FLD3	Social sciences (geography, history, psychology, sociology etc.)		
FLD4	Arts and languages		
FLD5	Courses related to one of the trades (such as for plumbers, electricians, tool and dye makers)		
FLD6	Business management (such as, entrepreneurship, human resource management, accounting and financial management)		

FLD7	Courses related to a career for which registration is needed with the bodies regulating the industry) (estate agents, security etc.)		
	Any other course _____ _____		

Section D: Motivation to Complete the Course

To what extent do you agree with the following statements? **I will continue studying to get the MOOC completed certificate**		Strongly disagree	Disagree	Neither agree nor agree	Agree	Strongly agree
CON T1	If the materials used in a MOOC are at the right level for me (not too difficult)	1	2	3	4	5
CON T2	Even if the course is very easy and a bit boring	1	2	3	4	5
CON T3	Even if the course material seems outdated	1	2	3	4	5
CON T4	Even if my family have to do things without me sometimes	1	2	3	4	5
CON T5	Even if I must study late at night or very early in the morning	1	2	3	4	5
CON T6	Provided that the data costs to access the internet and download material do not turn out to be too high	1	2	3	4	5
CON T7	As sharing of knowledge with my peers is very important	1	2	3	4	5
CON T8	If it is similar to an accredited qualification, I will enrol for later	1	2	3	4	5

By completing a MOOC, I will:		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
COM P1	Improve my knowledge	1	2	3	4	5
COM P2	Stand a chance for a promotion	1	2	3	4	5
COM P3	Feel motivated to further my studies	1	2	3	4	5

COMP4	Improve my prospects for a job	1	2	3	4	5

To what extent do you agree with the following statements? **I am confident that I can complete the MOOC course I choose because:**	**Strongly disagree**	**Disagree**	**Neither agree nor disagree**	**Agree**	**Strongly agree**
SE1	I have made a commitment to complete the course	1	2	3	4	5
SE2	I am good with time management	1	2	3	4	5
SE3	I do not have to attend classes which might be at inconvenient times	1	2	3	4	5
SE4	I have done well in other classroom-based courses	1	2	3	4	5
SE5	I can overcome the disappointment of failing an assignment					

To what extent do you agree with the following statements? **I think I would complete a MOOC if:**	**Strongly disagree**	**Disagree**	**Neither agree nor agree**	**Agree**	**Strongly agree**
SP1	I get enough help from my tutors and lecturers					
SP2	I get support from my peers and friends					
SP3	It is recognised by other South African universities,					
SP4	It is recognised by employers					
SP5	It is recognised internationally					

To what extent do you agree with the following statements? **I am more likely to complete a MOOC if:**	**Strongly disagree**	**Disagree**	**Neither agree nor agree**	**Agree**	**Strongly agree**
ISP1	I am provided with free air time for internet access					
ISP2	I am provided with a suitable device (e.g. tablet computer)					

		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
ISP3	I am provided with a study venue with all the necessary facilities					
ISP4	The information provided initially was clear and described the course content accurately					
ISP5	Know in advance what the course entails					
ISP6	Have experience on online learning					

Section E: Government's Role

To what extent do you agree with the following statements? **I think Government should:**		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
GS P1	Evaluate all short courses (e.g. MOOCs) for accreditation	1	2	3	4	5
GS P2	Encourage employers and educational institutions to recognise MOOCs	1	2	3	4	5
GS P3	Subsidise bridging courses to increase MOOC completion	1	2	3	4	5
GS P4	Promote / Advertise the offering of MOOCs nationwide	1	2	3	4	5
GS P5	Reward institutions, based on the number of learners / learners who successfully complete recognised MOOCs	1	2	3	4	5
GS P6	Provide suitable telecommunication infrastructure for MOOCs	1	2	3	4	5
GS P7	Together with the private sector, identify the skills shortages and support the design of appropriate MOOCs	1	2	3	4	5
GS P8	Encourage the private sector to employ people who are registered for MOOCs	1	2	3	4	5

RE G6	If social media as well as other audio-visual media (videos, blogs, podcasts	1	2	3	4	5

	etc.) are used in the course					
RE G7	As I like sharing knowledge with learners who want to achieve the same goal as I do	1	2	3	4	5
RE G8	If I am sure what MOOC course I should take	1	2	3	4	5
RE G9	As I believe a MOOC has the same benefits as learning in a classroom	1	2	3	4	5

Thank you for your participation

Addendum C: References Supporting the Questionnaire Design and Links to the Conceptual Framework

Question	References	In conceptual framework (Figure 2-3)
Demographics		
A1 (gender)	(Garrido et al. 2016)	Yes
A2 (race)		Yes
A3 (year of birth)	(Garrido et al. 2016)	Yes
A4 (highest education level)	(Garrido et al. 2016)	Yes
A5 (presently studying)		Yes
A6 (employment status)	(Garrido et al. 2016)	Yes
A7 (internet access)	(Garrido et al. 2016)	Yes
Accreditation		
ACC1	(Liyanagunawardena, Adams and Williams 2013; Woldegiyorgis and Carvalho 2015; Garrido et al. 2016)	Yes
ACC2	(Liyanagunawardena, Adams and Williams 2013; Castillo et al. 2015; Woldegiyorgis and Carvalho 2015; Garrido et al. 2016; Tracey, Swart and Murphy 2018)	
ACC3	(Woldegiyorgis and Carvalho 2015)	
Screening questions		
KN1	(Boga and McGreal 2014; Castillo et al. 2015; Garrido et al. 2016)	No
KN2	(Boga and McGreal 2014; Castillo et al. 2015; Garrido et al. 2016)	
KN3	(Boga and McGreal 2014; Castillo et al. 2015; Garrido et al. 2016)	
KN4	(Boga and McGreal 2014; Castillo et al. 2015; Garrido et al. 2016)	
KN5	(Boga and McGreal 2014; Castillo et al. 2015; Garrido et al. 2016)	
SC2		No
SC3		
Motivation to enrol for (register for) MOOCs		
REG0		Previous experience with MOOC Yes
CPL1		
CPL2		
CPL3		

FTR1	(Woldegiyorgis and Carvalho 2015; Garrido et al. 2016; Tracey, Swart and Murphy 2018)	MOOC functions Yes
FTR2	(Garrido et al. 2016)	
FTR3	(Tariq, Mubeen and Mahmood 2011; Garrido et al. 2016; Kopp, Gröblinger and Zimmermann 2017)	
FTR4	(Woldegiyorgis and Carvalho 2015; Garrido et al. 2016; Henderikx, Kreijns and Kalz 2017)	
FTR5	(Castillo et al. 2015; Garrido et al. 2016; Czerniewicz et al. 2017; Dhorne et al. 2017)	
FTR6	(Garrido et al. 2016)	
FTR7	(Liyanagunawardena, Adams and Williams 2013; Liyanagunawardena, Williams and Adams 2013; Jiang et al. 2014; Woldegiyorgis and Carvalho 2015; Garrido et al. 2016)	
FTR8	(Liyanagunawardena, Williams and Adams 2013; Woldegiyorgis and Carvalho 2015; Tracey, Swart and Murphy 2018)	Easy access to MOOC Yes
FTR9	(Liyanagunawardena, Williams and Adams 2013; Nesterko et al. 2013; Garrido et al. 2016; De Santis et al. 2019; Launois, Allotey and Reidpath 2019)	
FTR10	(Liyanagunawardena, Williams and Adams 2013; Jiang et al. 2014; Rohs and Ganz 2015; Woldegiyorgis and Carvalho 2015; Garrido et al. 2016; Kopp, Gröblinger and Zimmermann 2017; Tracey, Swart and Murphy 2018)	
FTR11	(Brunton et al. 2017)	
FTR12	(Woldegiyorgis and Carvalho 2015)	
REA1	(Tariq, Mubeen and Mahmood 2011; Nesterko et al. 2013; Garrido et al. 2016; Dhorne et al. 2017; Tracey, Swart and Murphy 2018)	External circumstances (Need for knowledge) Yes
REA2	(Woldegiyorgis and Carvalho 2015; Garrido et al. 2016; Dhorne et al. 2017; Kopp, Gröblinger and Zimmermann 2017; Henderikx, Kreijns and Kalz 2017)	
PER1	(Tariq, Mubeen and Mahmood 2011; Liyanagunawardena, Adams and Williams 2013; Woldegiyorgis and Carvalho 2015; Garrido et al. 2016; Tracey, Swart and Murphy 2018)	Personal preferences Yes
PER2	(Tariq, Mubeen and Mahmood 2011; Liyanagunawardena, Adams and Williams 2013)	
PER3	(Tariq, Mubeen and Mahmood 2011; Kopp, Gröblinger and Zimmermann 2017)	
PER4	(Moneta 2004; Tariq, Mubeen and Mahmood 2011; Woldegiyorgis and Carvalho 2015)	
PER5	(Brunton et al. 2017; Henderikx, Kreijns and Kalz 2017)	

PER6	(Rohs and Ganz 2015; Henderikx, Kreijns and Kalz 2017)	
PER7	(Brunton et al. 2017; Dhorne et al. 2017; Henderikx, Kreijns and Kalz 2017; Tracey, Swart and Murphy 2018; Launois, Allotey and Reidpath 2019)	
REG1	(Woldegiyorgis and Carvalho 2015; Czerniewicz et al. 2017; Tracey, Swart and Murphy 2018)	Interaction Yes
REG2	(Brunton et al. 2017; Czerniewicz et al. 2017; Dhorne et al. 2017; Henderikx, Kreijns and Kalz 2017; Tracey, Swart and Murphy 2018; De Santis et al. 2019)	
REG3	(Woldegiyorgis and Carvalho 2015; Tracey, Swart and Murphy 2018)	
REG4	(Liyanagunawardena, Williams and Adams 2013; Boga and McGreal 2014; Woldegiyorgis and Carvalho 2015; Launois, Allotey and Reidpath 2019)	
REG5	(Henderikx, Kreijns and Kalz 2017; Tracey, Swart and Murphy 2018; Launois, Allotey and Reidpath 2019)	
REG6	(Moneta 2004; Woldegiyorgis and Carvalho 2015; Kopp, Gröblinger and Zimmermann 2017; Tracey, Swart and Murphy 2018)	
REG7	(Liyanagunawardena, Williams and Adams 2013; Woldegiyorgis and Carvalho 2015; Tracey, Swart and Murphy 2018)	
REG8	(Liyanagunawardena, Adams and Williams 2013; Brunton et al. 2017; Tracey, Swart and Murphy 2018)	Analysed as REA (external) Yes
REG9	(Brunton et al. 2017; Henderikx, Kreijns and Kalz 2017; Tracey, Swart and Murphy 2018)	Analysed as PER (personal) Yes
BAR1	(Liyanagunawardena, Williams and Adams 2013; Boga and McGreal 2014; Rohs and Ganz 2015; Woldegiyorgis and Carvalho 2015)	External (barriers) Yes
BAR2	(Liyanagunawardena, Williams and Adams 2013; Boga and McGreal 2014; Castillo et al. 2015; Rohs and Ganz 2015; Woldegiyorgis and Carvalho 2015)	
BAR3	(Liyanagunawardena, Williams and Adams 2013; Boga and McGreal 2014)	
BAR4	(Liyanagunawardena, Williams and Adams 2013; Woldegiyorgis and Carvalho 2015)	
BAR5	(Woldegiyorgis and Carvalho 2015; Brunton et al. 2017)	
BAR6	(Liyanagunawardena, Williams and Adams 2013; De Santis et al. 2019)	
FLD1	(Garrido et al. 2016)	External

FLD2	(Garrido et al. 2016)	(fields of study) Yes
FLD3	(Garrido et al. 2016)	
FLD4	(Garrido et al. 2016)	
FLD5	(Garrido et al. 2016)	
FLD6	(Garrido et al. 2016)	
FLD7	(Garrido et al. 2016)	
Motivation to complete the course		
CONT1	(Woldegiyorgis and Carvalho 2015; Brunton et al. 2017; Henderikx, Kreijns and Kalz 2017)	Persistence
CONT2		
CONT3		
CONT4	(Garrido et al. 2016; Brunton et al. 2017; Henderikx, Kreijns and Kalz 2017)	
CONT5	(Tariq, Mubeen and Mahmood 2011)	
CONT6		Analysed with SP (Experienced support)
CONT7	(Liyanagunawardena, Williams and Adams 2013; Woldegiyorgis and Carvalho 2015; Tracey, Swart and Murphy 2018)	Analysed with COMP (Rewards)
CONT8	(Jiang et al. 2014; Garrido et al. 2016; Henderikx, Kreijns and Kalz 2017; De Santis et al. 2019; Launois, Allotey and Reidpath 2019)	
COMP1	(Liyanagunawardena, Adams and Williams 2013; Nesterko et al. 2013; Garrido et al. 2016; Henderikx, Kreijns and Kalz 2017; De Santis et al. 2019; Launois, Allotey and Reidpath 2019)	Rewards Yes
COMP2	(Tracey, Swart and Murphy 2018)	
COMP3	(Liyanagunawardena, Adams and Williams 2013; Dhorne et al. 2017; Henderikx, Kreijns and Kalz 2017)	
COMP4	(Nesterko et al. 2013; Garrido et al. 2016; Tracey, Swart and Murphy 2018; De Santis et al. 2019; Launois, Allotey and Reidpath 2019)	
SE1	(Tariq, Mubeen and Mahmood 2011; Liyanagunawardena, Williams and Adams 2013; Jiang et al. 2014; Henderikx, Kreijns and Kalz 2017; Tracey, Swart and Murphy 2018)	MOOC self-efficacy Yes
SE2	(Tariq, Mubeen and Mahmood 2011; Garrido et al. 2016; Brunton et al. 2017; Dhorne et al. 2017)	
SE3	(Tracey, Swart and Murphy 2018)	
SE4		
SE5	(Moneta 2004; Tariq, Mubeen and Mahmood 2011; Brunton et al., 2017; Henderikx, Kreijns and Kalz 2017; Tracey, Swart and Murphy 2018)	
SP1	(Liyanagunawardena, Williams and Adams 2013; Nesterko et al. 2013; Dhorne et al. 2017)	SP (Experienced support)
SP2	(Nesterko et al. 2013; Brunton et al. 2017; Czerniewicz et al. 2017; Dhorne et al. 2017;	

	Henderikx, Kreijns and Kalz 2017)	
SP3	(Woldegiyorgis and Carvalho, 2015)	
SP4	(Liyanagunawardena, Williams and Adams 2013; Woldegiyorgis and Carvalho 2015; Tracey, Swart and Murphy 2018)	
SP5		
ISP1	(Woldegiyorgis and Carvalho 2015)	Institutional support
ISP2	(Woldegiyorgis and Carvalho 2015)	Yes
ISP4		
ISP5		
ISP6	(Brunton et al. 2017; Henderikx, Kreijns and Kalz 2017)	
Government's role		
GSP1	(Woldegiyorgis and Carvalho 2015)	Yes
GSP2	(Castillo et al. 2015; Woldegiyorgis and Carvalho 2015)	
GSP3	(Woldegiyorgis and Carvalho 2015)	
GSP4		
GSP5		
GSP6	(Castillo et al. 2015; Rohs and Ganz 2015)	
GSP7	(Woldegiyorgis and Carvalho 2015)	
GSP8		

Addendum D: OSMOZ Report on Pilot Study

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MOOCs Pilot Study

The pilot was conducted in Gauteng and Eastern Cape provinces from **11 to 20 December 2019**. A total of 100 questionnaires were completed:

- 51 Urban area: Johannesburg
- 22 Township: Soweto
- 27 Rural area: Alice and Bisho (Eastern Cape)

Following the fieldwork, several important observations were made:

1- Most respondents manifested an interest in the research topic.
2- Most respondents have never heard about MOOCs and don't know the difference between MOOCs and Online courses usually offered by academic institutions.
3- Respondents **complained** about the length of the questionnaire and apparent repetitions of questions. Most complaints were voiced by respondents in rural areas. This resulted in the following:
   - Most respondents could not complete the questionnaire on the spot.
   - Respondents took one day and more to return the completed questionnaire.
   - Many questionnaires had missing values.
4- Some respondents in rural areas refused to sign the consent form because of the fear of being judges for given wrong answers.
5- Respondents in rural areas had problem understanding questions on accreditation.
6- Some respondents had difficulties understanding the sense of question ACC6 (I will not take a course even if it is accredited because they are inferior to courses offered by a college or university)

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Reg: 2015/026062/07

7- Some respondents had difficulties with question ADV1 to ADV6 (there are advantages in MOOCs Because of some offer). Since respondents mostly do not have prior knowledge about MOOCs, respondents answered the question assuming that each of the advantages listed is a feature of MOOCs.

8- Many Respondents selected more than one field of study although the question "if you were going to study a MOOC for which field would you enrol?" (page 6) requires only one field to be selected. Fieldworkers will ensure that this question is answered appropriately.

Recommendations

1- Length of the questionnaire remains a major concern. We strongly advise that questions that look similar should be revised.

2- The following questions should be revised: ADV1 to ADV6 (there are advantages in MOOCs Because some offer); ACC6 (I will not take a course even if it is accredited because they are inferior to courses offered by a college or university).

3- A clear definition of MOOCs must be included in the questionnaire ideally after the screening questions.

4- Incentives must be used in Rural area.

Addendum E: Cross-Tabulations between Other Demographics and Highest Post-Primary School Level of Education

Note: See Section 3.3.4 for a full discussion.

E.1   Province * Post-primary education

Province		Middle School	High School	College	University Bachelor's Degree	Postgrad	Total
Gauteng	Count	25	403	201	152	70	851
	% within Province	2.9	47.4	23.6	17.9	8.2	100
KwaZulu-Natal	Count	50	383	82	39	13	567
	% within Province	8.8	67.5	14.5	6.9	2.3	100
Free State	Count	9	75	60	9	6	159
	% within Province	5.7	47.2	37.7	5.7	3.8	100
Eastern Cape	Count	46	178	56	41	36	357
	% within Province	12.9	49.9	15.7	11.5	10.1	100
Limpopo	Count	31	94	50	57	73	305
	% within Province	10.2	30.8	16.4	18.7	23.9	100
Mpuma-langa	Count	47	110	45	17	5	224
	% within Province	21.0	49.1	20.1	7.6	2.2	100
North West	Count	17	124	45	20	12	218
	% within Province	7.8	56.9	20.6	9.2	5.5	100
Northern Cape	Count	7	49	5	< 5	< 5	63
	% within Province	11.1	77.8	7.9	$n < 5$	$n < 5$	100
Western Cape	Count	68	164	85	16	13	346
	% within Province	19.7	47.4	24.6	4.6	3.8	100
Total	Count	300	1 580	629	353	228	3 090
	% within Province	9.7	51.1	20.4	11.4	7.4	100

The educational profiles of the provinces seem very diverse: for example, Limpopo has percentages way above those of the full sample for the Bachelor's and particularly for Postgraduate HEL, while KwaZulu-Natal and North West have very low percentages for all the tertiary education levels. Free State has a high percentage for college but not for any level of university degrees. Hence, the requirements for MOOC contents may vary widely across provinces.

Symmetric Measures					
		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Nominal by Nominal	Phi	.392			.000
	Cramer's V	.196			.000

Ordinal by Ordinal	Kendall's tau-b	–.106	.014	–7.455	.000
No. of valid cases		3 090			
a. Not assuming the null hypothesis.					
b. Using the asymptotic standard error assuming the null hypothesis.					
According to Cramer's V this is a weak but significant relationship.					

E.2   Gender * Post-primary education

Gender		Middle School	High School	College	University Bachelor's Degree	Postgrad	Total
Male	Count	145	749	313	178	120	1 505
	% within Gender	9.6	49.8	20.8	11.8	8.0	100
Female	Count	154	825	315	175	108	1 577
	% within Gender	9.8	52.3	20	11.1	6.8	100
Total	Count	299	1574	628	353	228	3 082
	% within Gender	9.7	51.1	20.4	11.5	7.4	100

Bar Chart
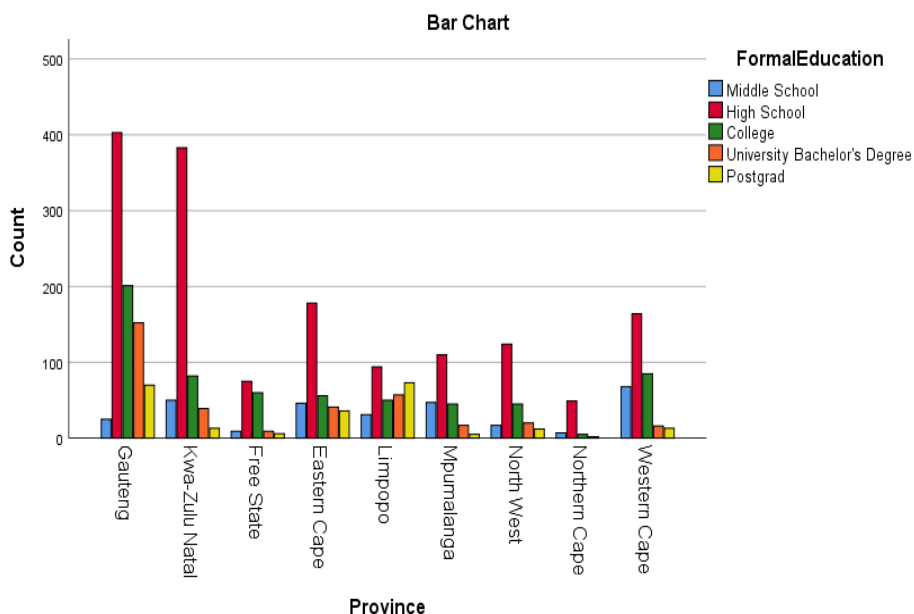
E.2   Gender * Post-primary education

Symmetric Measures

		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Nominal by Nominal	Phi	.031			.571
	Cramer's V	.031			.571
Ordinal by Ordinal	Kendall's tau-b	– .024	.017	-1.452	.146
No. of valid cases		3 082			
a. Not assuming the null hypothesis.					
b. Using the asymptotic standard error assuming the null hypothesis.					
No significant differences by gender. This is different from most of the other cross tabulations Cramer vs significance.					

Bar Chart
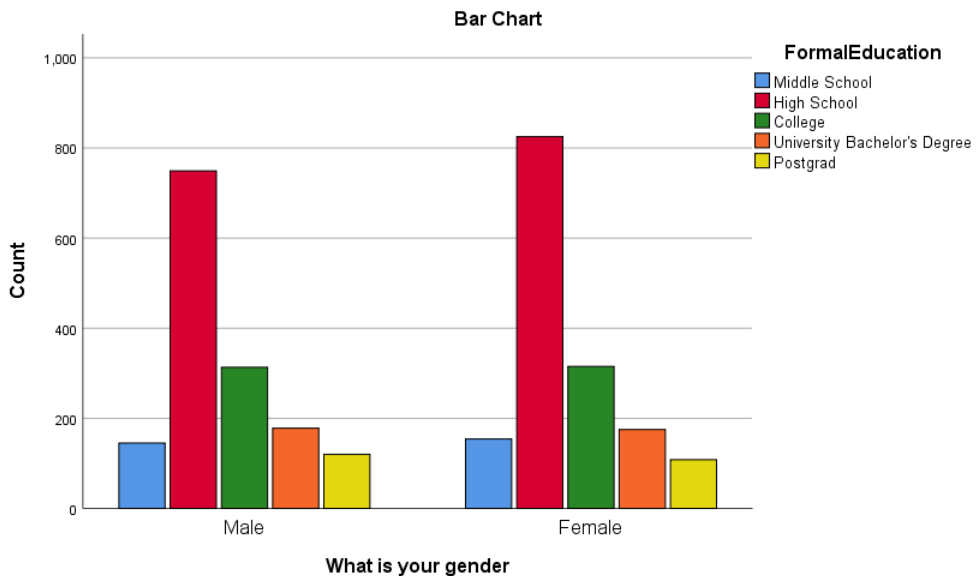
E.3 Racial group * Post-primary education

Racial group		Middle School	High School	College	University Bachelor's Degree	Postgrad	Total
Black	Count	251	1 222	501	275	179	2 428
	% within Racial group	10.3	50.3	20.6	11.3	7.4	100
White	Count	8	149	64	37	30	288
	% within Racial group	2.8	51.7	22.2	12.8	10.4	100
Coloured	Count	36	89	41	21	7	194
	% within Racial group	18.6	45.9	21.1	10.8	3.6	100
Indian	Count	<5	104	18	18	10	154
	% within Racial group	$n < 5$	67.5	11.7	11.7	6.5	100
Others	Count	<5	11	5	<5	<5	19
	% within Racial group	$n < 5$	57.9	26.3	$n < 5$	$n < 5$	100

Total	Count	300	1 575	629	352	227	3 083
	% within Racial group	9.7	50.4	20.4	11.4	7.4	100

Coloured learners seem to be lagging slightly compared to the other groups. More Indian learners are at high school level than other groups, but they choose other forms of tertiary rather than college education.

Symmetric Measures					
		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Nominal by Nominal	Phi	.144			.000
	Cramer's V	.072			.000
Ordinal by Ordinal	Kendall's tau-b	.002	.016	.154	.878
No. of valid cases		3 083			
a. Not assuming the null hypothesis.					
b. Using the asymptotic standard error assuming the null hypothesis.					
According to Cramer's V this is a weak but significant relationship.					

Bar Chart

E.4   Age * Post-primary education

Age		Middle School	High School	College	University Bachelor's Degree	Postgrad	Total
51 to 60	Count	< 5	< 5	6	< 5	< 5	16
	% within Age	$n < 5$	$n < 5$	37.5%	$n < 5$	$n < 5$	100.0%
41 to 50	Count	10	33	22	12	12	89
	% within Age	11.2%	37.1%	24.7%	13.5%	13.5%	100.0%

31 to 40	Count	59	173	119	67	75	493
	% within Age	12.0%	35.1%	24.1%	13.6%	15.2%	100.0%
21 to 30	Count	179	1130	457	263	134	2163
	% within Age	8.3%	52.2%	21.1%	12.2%	6.2%	100.0%
18 to 20	Count	40	229	23	10	< 5	302
	% within Age	13.2%	75.8%	7.6%	3.3%	$n < 5$	100.0%
Total	Count	291	1 568	627	353	224	3 063
	% within Age	9.5%	51.2%	20.5%	11.5%	7.3%	100.0%

The over 60 group was too small to be included. The groups 41 to 50 and 31 to 40 have very similar percentages. These apartheid era groups were born in 1990 or before. High school education percentages improve markedly for those younger than 31 years old. The vast majority of respondents (about 70%) are in the 21 to 30 years old group, and even more for the under 21 year old group (but that group is relatively small).

Symmetric Measures					
		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Nominal by Nominal	Phi	.261			.000
	Cramer's V	.130			.000
Ordinal by Ordinal	Kendall's tau-b	–.165	.016	–10.104	.000
No. of valid cases		3 063			
a. Not assuming the null hypothesis					
b. Using the asymptotic standard error assuming the null hypothesis					
According to Cramer's V this is a weak but significant relationship.					

Bar Chart

E.5   Internet access * Post-primary education

Most frequent internet access		Middle School	High School	College	University Bachelor's Degree	Postgrad	Total
Do not access it all	Count	48	62	18	7	< 5	136
	% within Most frequent internet access	35.3	45.6	13.2	5.1	$n < 5$	100
Friend's / Relative's house	Count	27	46	7	< 5	< 5	82
	% within Most frequent internet access	32.9	56.1	8.5	$n < 5$	$n < 5$	100
School / University or NEMISA CoLab	Count	6	130	38	52	29	255
	% within Most frequent internet access	2.4	51.0	14.9	20.4	11.4	100
Home or on my own mobile device	Count	161	1 008	402	201	119	1 891
	% within Most frequent internet access	8.5	53.3	21.3	10.6	6.3	100
Cybercafe / Internet cafe	Count	19	70	24	7	10	130
	% within Most frequent internet access	14.6	53.8	18.5	5.4	7.7	100
Free Wi-Fi zones	Count	19	178	87	38	21	343
	% within Most	5.5	51.9	25.4	11.1	6.1	100

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including a public library	frequent internet access						
Telecentre / Community centre	Count	7	26	10	8	5	56
	% within Most frequent internet access	12.5	46.4	17.9	14.3	8.9	100
Workplace	Count	6	42	37	36	41	162
	% within Most frequent internet access	3.7	25.9	22.8	22.2	25.3	100
Other	Count	< 5	10	< 5	< 5	< 5	19
	% within Most frequent internet access	$n < 5$	52.6	$n < 5$	$n < 5$	$n < 5$	100
Total	Count	296	1 572	626	352	228	3 074
	% within Most frequent internet access	9.6	51.1	20.4	11.5	7.4	100

Note: Most popular by far is mobile (in red) but second choices (in blue) vary according to level.

Addendum F: Cross-Tabulations between Other Demographics and Employment Status

Note: See Section 3.3.4 for a full discussion.

F.1   Province * Employment (excluding retired)

Province		Not employed	Partially	Fully	Total
Gauteng	Count	620	55	182	857
	% within Province	72.3%	6.4%	21.2%	100.0%
KwaZulu-Natal	Count	468	33	72	573
	% within Province	81.7%	5.8%	12.6%	100.0%
Free State	Count	126	8	24	158
	% within Province	79.7%	5.1%	15.2%	100.0%
Eastern Cape	Count	294	14	51	359
	% within Province	81.9%	3.9%	14.2%	100.0%
Limpopo	Count	127	49	130	306
	% within Province	41.5%	16.0%	42.5%	100.0%
Mpumalanga	Count	175	8	40	223
	% within Province	78.5%	3.6%	17.9%	100.0%
North West	Count	179	9	36	224
	% within Province	79.9%	4.0%	16.1%	100.0%
Northern Cape	Count	54	1	8	63
	% within Province	85.7%	1.6%	12.7%	100.0%
Western Cape	Count	134	54	167	355
	% within Province	37.7%	15.2%	47.0%	100.0%
Total	Count	2 177	231	710	3 118
	% within Province	69.8%	7.4%	22.8%	100.0%

The data samples from Limpopo and Western Cape show much lower total unemployment than the other provinces. The samples from these two provinces also show higher partial employment but also higher full employment than the other provinces.

Symmetric Measures		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Nominal by Nominal	Phi	.356			.000
	Cramer's V	.252			.000
Ordinal by Ordinal	Kendall's tau-b	.133	.016	8.282	.000
No. of valid cases		3 118			
a. Not assuming the null hypothesis.					

| b. Using the asymptotic standard error assuming the null hypothesis. |
| According to Cramer's V this is a weak but significant relationship. |

Bar Chart
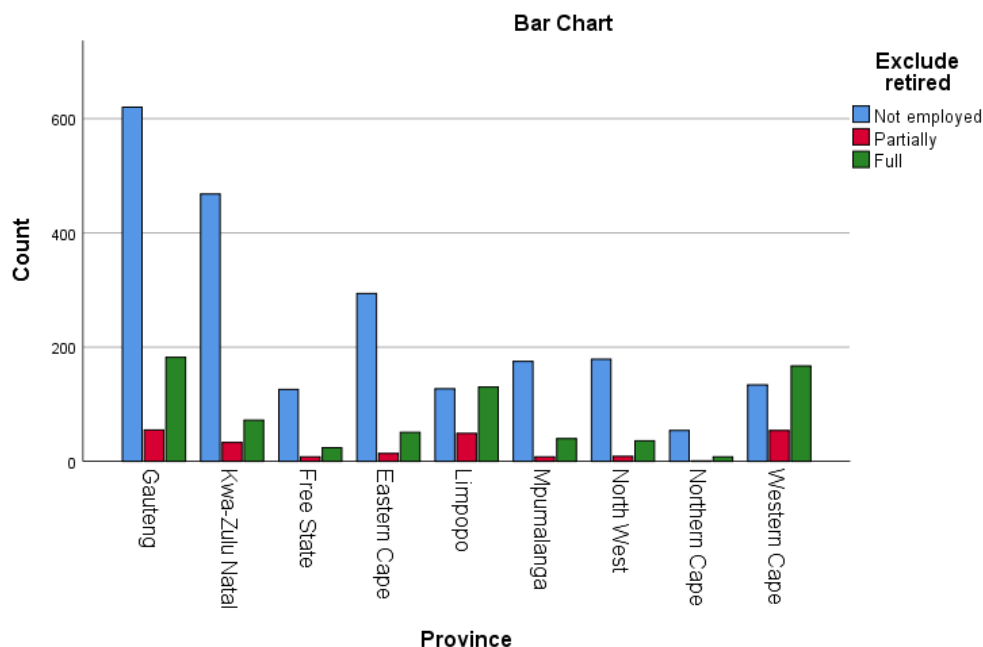
F.2 Gender * Employment (excluding retired)

Gender		Not employed	Partially	Full	Total
Male	Count	1000	130	382	1 512
	% within Gender	66.1%	8.6%	25.3%	100.0%
Female	Count	1 173	101	324	1 598
	% within Gender	73.4%	6.3%	20.3%	100.0%
Total	Count	2 173	231	706	3 110
	% within Gender	69.9%	7.4%	22.7%	100.0%

As is to be expected, females have lower employment than males.

Symmetric Measures					
		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Nominal by Nominal	Phi	.080			.000
	Cramer's V	.080			.000
Ordinal by Ordinal	Kendall's tau-b	.075	.017	−4.280	.000
No. of valid cases		3 110			

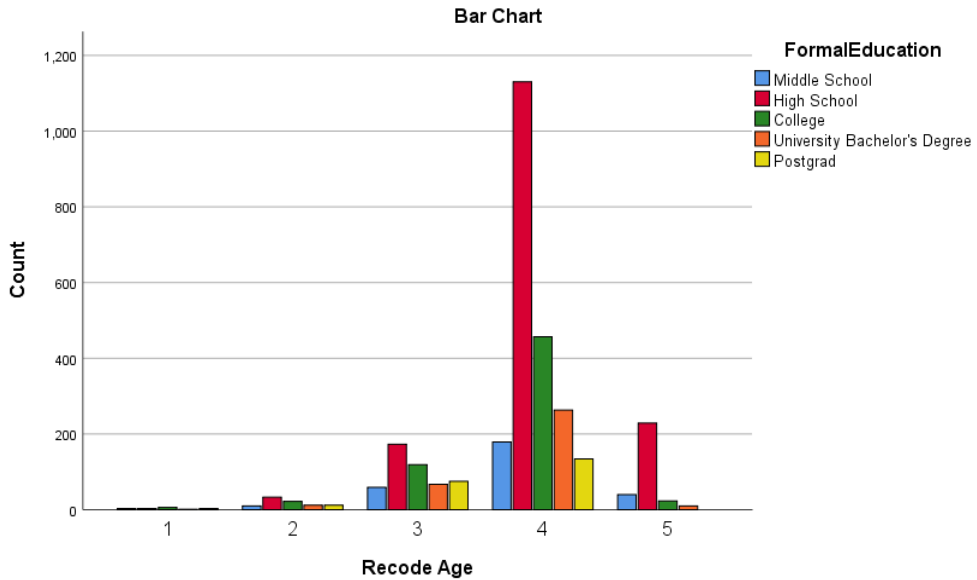|	
a. Not assuming the null hypothesis.	
b. Using the asymptotic standard error assuming the null hypothesis.	
According to Cramer's V this is a weak but significant relationship.	

Bar Chart
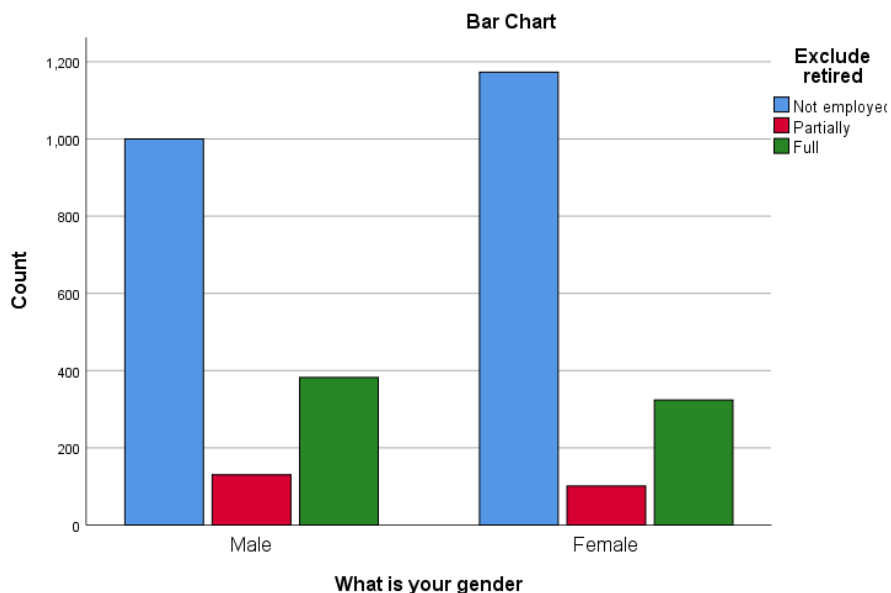
F.3 Racial group * Employment (excluding retired)

Racial group		Not employed	Partially	Full	Total
Black	Count	1 828	152	471	2 451
	% within Racial group	74.6%	6.2%	19.2%	100.0%
White	Count	125	42	120	287
	% within Racial group	43.6%	14.6%	41.8%	100.0%
Coloured	Count	106	21	72	199
	% within Racial group	53.3%	10.6%	36.2%	100.0%
Indian	Count	103	15	37	155
	% within Racial group	66.5%	9.7%	23.9%	100.0%
Others	Count	11	0	8	19
	% within Racial group	57.9%	0.0%	42.1%	100.0%
Total	Count	2 173	230	708	3 111
	% within Racial group	69.8%	7.4%	22.8%	100.0%

The unemployment percentages are as commonly reported, but they are very unequal. A high percentage of the total sample is Black as is to be expected from the quota sampling strategy used.

Symmetric Measures					
		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Nominal by Nominal	Phi	.222			.000
	Cramer's V	.157			.000
Ordinal by Ordinal	Kendall's tau-b	.173	.018	9.419	.000
No. of valid cases		3 111			
a. Not assuming the null hypothesis.					
b. Using the asymptotic standard error assuming the null hypothesis.					
According to Cramer's V this is a weak but significant relationship.					

Bar Chart

F.4   Age * Employment (excluding retired)

Age (Years)		Not employed	Partially	Full	Total
51 to 60	Count	5	0	8	13
	% within Age	38.5%	0.0%	61.5%	100.0%
41 to 50	Count	38	6	44	88
	% within Age	43.2%	6.8%	50.0%	100.0%
31 to 40	Count	217	51	231	499
	% within Age	43.5%	10.2%	46.3%	100.0%
21 to 30	Count	1 622	161	405	2 188
	% within Age	74.1%	7.4%	18.5%	100.0%
18 to 20	Count	276	12	16	304
	% within Age	90.8%	3.9%	5.3%	100.0%
Total	Count	2158	230	704	3092
	% within Age	69.8%	7.4%	22.8%	100.0%

Very few people older than 50 were included in the sample. Unemployment is extremely high in the category 18 to 20 years (these might have been full time learners), but decreases in the older categories. A very high proportion of those who answered the questionnaire are aged from 21 to 30 years.

Symmetric Measures					
		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Nominal by Nominal	Phi	.318			.000
	Cramer's V	.225			.000
Ordinal by Ordinal	Kendall's tau-b	–.287	.016	–16.733	.000
No. of valid cases		3 092			
a. Not assuming the null hypothesis.					
b. Using the asymptotic standard error assuming the null hypothesis.					
According to Cramer's V this is a weak but significant relationship.					

F.5   Highest education level * Employment (excluding retired)

Highest educational level		Not employed	Partially	Fully	Total
No formal education	Count	2	0	3	5
	% within Educational level	40.0%	0.0%	60.0%	100.0%
Primary School	Count	13	0	4	17
	% within Educational level	76.5%	0.0%	23.5%	100.0%
Middle School	Count	235	14	45	294

	% within Educational level	79.9%	4.8%	15.3%	100.0%
High School	Count	1220	106	249	1575
	% within Educational level	77.5%	6.7%	15.8%	100.0%
College	Count	406	53	163	622
	% within Educational level	65.3%	8.5%	26.2%	100.0%
University Bachelor's Degree	Count	193	38	122	353
	% within Educational level	54.7%	10.8%	34.6%	100.0%
Postgrad	Count	89	19	119	227
	% within Educational level	39.2%	8.4%	52.4%	100.0%
Total	Count	2158	230	705	3093
	% within Educational level	69.8%	7.4%	22.8%	100.0%

In the sample, the largest group by far have attended high school, but the question did not ask to what grade. Although there are still high levels of unemployment even amongst postgraduates, this does decrease with increased tertiary education. Secondary school education makes little difference – this may be because it does not necessarily reflect gaining a Matric certificate. The options for Partially employed were not selected often. Full employment includes self-employed; while Not employed includes currently unemployed, never employed and full time learners. No formal education and primary school only should be disregarded because of the small numbers.

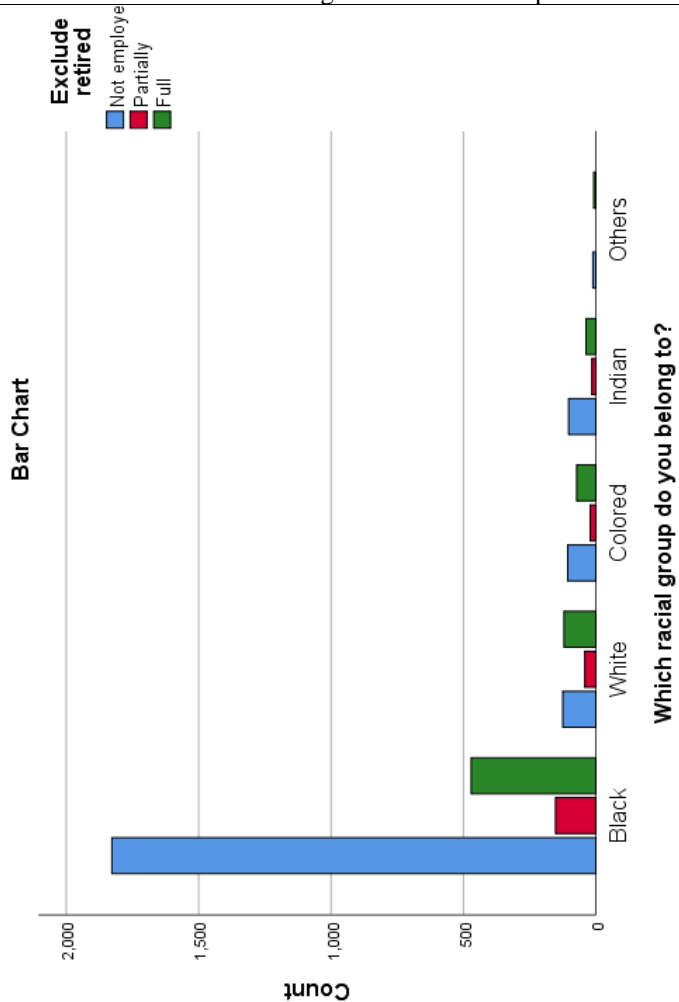| Symmetric Measures					
		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Nominal by Nominal	Phi	.271			.000
	Cramer's V	.191			.000
Ordinal by Ordinal	Kendall's tau-b	.218	.016	12.960	.000
No. of valid cases		3 071			
a. Not assuming the null hypothesis.					
b. Using the asymptotic standard error assuming the null hypothesis.					
According to Cramer's V this is a weak but significant relationship.					

Bar Chart

F.6 Currently studying * Employment (excluding retired)

Currently studying		Not employed	Partially	Fully	Total
Full time	Count	886	62	66	1 014
	% within Currently studying	87.4%	6.1%	6.5%	100.0%
Part time	Count	250	55	145	450
	% within Currently studying	55.6%	12.2%	32.2%	100.0%
Not studying	Count	1034	112	493	1639
	% within Currently studying	63.1%	6.8%	30.1%	100.0%
Total	Count	2 170	229	704	3 103
	% within Currently studying	69.9%	7.4%	22.7%	100.0%

Understandably, the full time learners are largely Not employed, whereas approximately 45% of the part time learners have part time or full time employment. However, nearly two thirds of those Not studying are unemployed. Targeting this group may be a strategy to consider. Fully employed people were not inclined in the study (but they might be in low level employment and not see how studying could help them).

Symmetric Measures					
		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Nominal by Nominal	Phi	.289			.000
	Cramer's V	.205			.000

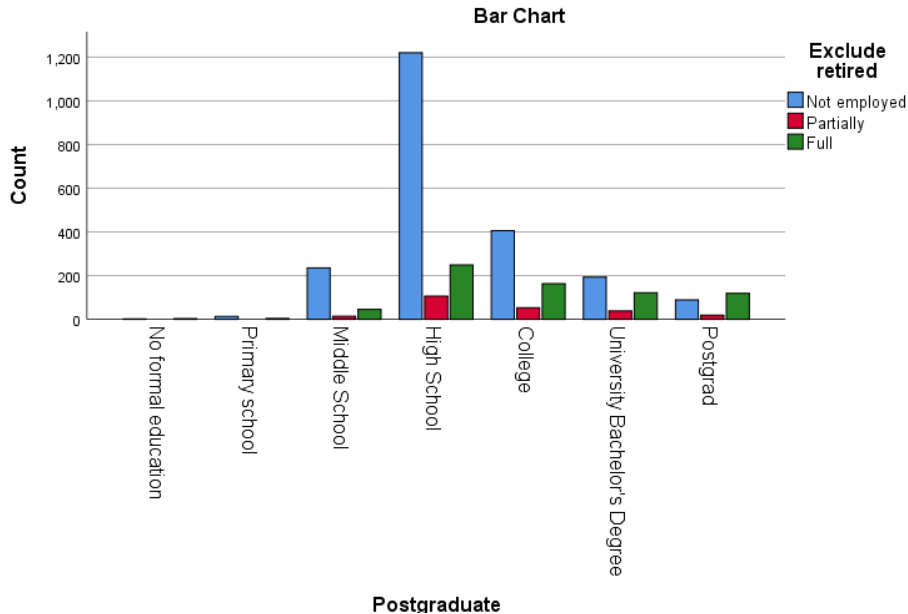|					
Ordinal by Ordinal	Kendall's tau-b	.213	.015	14.132	.000
No. of valid vases		3 103			
a. Not assuming the null hypothesis.					
b. Using the asymptotic standard error assuming the null hypothesis.					
According to Cramer's V this is a weak but significant relationship.					

F.7   Most frequent internet access * Employment (excluding retired)

Most frequent internet access		Not employed	Partially	Full	Total
Do not access it all	Count	121	7	15	143
	% within Most frequent internet access	84.6%	4.9%	10.5%	100.0%
Friend's / Relative's house	Count	69	4	10	83
	% within Most frequent internet access	83.1%	4.8%	12.0%	100.0%
School / University or NEMISA CoLab	Count	222	14	19	255
	% within Most frequent internet access	87.1%	5.5%	7.5%	100.0%
Home or on my own mobile device	Count	1317	138	452	1907
	% within Most frequent internet access	69.1%	7.2%	23.7%	100.0%
Cybercafe / Internet cafe	Count	100	8	26	134
	% within Most frequent internet access	74.6%	6.0%	19.4%	100.0%
Free Wi-Fi zones including a public library	Count	271	25	48	344
	% within Most frequent internet access	78.8%	7.3%	14.0%	100.0%
Telecentre / Community centre	Count	34	9	13	56
	% within Most frequent internet access	60.7%	16.1%	23.2%	100.0%
Workplace	Count	18	24	122	164
	% within Most frequent internet access	11.0%	14.6%	74.4%	100.0%
Other	Count	15	2	1	18
	% within Most frequent internet access	83.3%	11.1%	5.6%	100.0%
Total	Count	2 167	231	706	3 104
	% within Most frequent internet access	69.8%	7.4%	22.7%	100.0%

By far the most often indicated way of accessing the internet is via mobile phone. Even for those who are fully employed this is almost four times more popular than accessing the internet at work.

Symmetric Measures		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Nominal by Nominal	Phi	.347			.000
	Cramer's V	.245			.000
Ordinal by Ordinal	Kendall's tau-b	.162	.015	10.190	.000
No. of valid cases		3 104			
a. Not assuming the null hypothesis.					
b. Using the asymptotic standard error assuming the null hypothesis.					
According to Cramer's V this is a weak but significant relationship.					

Addendum G: Cross-Tabulations between Other Demographics and Currently Studying

Note: See Section 3.3.4 for a full discussion.

G.1   Province * Currently studying

Province		Full time	Part time	Not studying	Total
Gauteng	Count	359	157	339	855
	% within Province	42.0%	18.4%	39.6%	100.0%
KwaZulu-Natal	Count	196	64	313	573
	% within Province	34.2%	11.2%	54.6%	100.0%
Free State	Count	70	33	57	160
	% within Province	43.8%	20.6%	35.6%	100.0%
Eastern Cape	Count	151	13	197	361
	% within Province	41.8%	3.6%	54.6%	100.0%
Limpopo	Count	16	68	218	302
	% within Province	5.3%	22.5%	72.2%	100.0%
Mpumalanga	Count	58	29	140	227
	% within Province	25.6%	12.8%	61.7%	100.0%
North West	Count	109	33	82	224
	% within Province	48.7%	14.7%	36.6%	100.0%
Northern Cape	Count	15	< 5	45	63
	% within Province	23.8%	*n* < 5	71.4%	100.0%
Western Cape	Count	46	53	261	360
	% within Province	12.8%	14.7%	72.5%	100.0%
Total	Count	1 020	453	1 652	3 125
	% within Province	32.6%	14.5%	52.9%	100.0%

Limpopo, Western Cape and Northern Cape have a disproportionate number of people Not studying. Western Cape and Limpopo also have surprisingly low unemployment. Is there a connection? Note, the graph shows counts not percentages and this may be misleading as there are bigger populations of respondents in some provinces.

Symmetric Measures					
		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Nominal by Nominal	Phi	.331			.000
	Cramer's V	.234			.000
Ordinal by Ordinal	Kendall's tau-b	.154	.014	10.772	.000
No. of valid cases		3 125			
a. Not assuming the null hypothesis.					
b. Using the asymptotic standard error assuming the null hypothesis.					
According to Cramer's V this is a weak but significant relationship.					

Bar Chart

G.2   Gender * Currently studying

Gender		Full time	Part time	Not studying	Total
Male	Count	501	196	821	1 518
	% within Gender	33.0%	12.9%	54.1%	100.0%
Female	Count	519	255	825	1 599
	% within Gender	32.5%	15.9%	51.6%	100.0%
Total	Count	1 020	451	1 646	3 117
	% within Gender	32.7%	14.5%	52.8%	100.0%

Similar figures between the genders are reflected in a less significant *p*-value.

Symmetric Measures					
		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Nominal by Nominal	Phi	.044			.051
	Cramer's V	.044			.051
Ordinal by Ordinal	Kendall's tau-b	-.013	.017	-.758	.448
No. of valid cases		3 117			

| a. Not assuming the null hypothesis. |
| b. Using the asymptotic standard error assuming the null hypothesis. |
| According to Cramer's V this is a weak and not very significant relationship. |

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G.3 Racial group * Currently studying
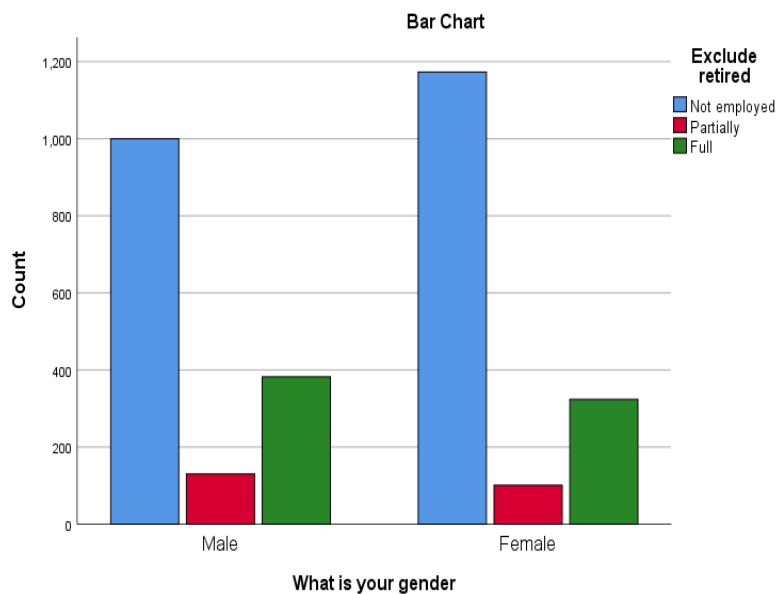
Racial group		Full time	Part time	Not studying	Total
Black	Count	745	376	1334	2455
	% within Racial group	30.3%	15.3%	54.3%	100.0%
White	Count	120	35	136	291
	% within Racial group	41.2%	12.0%	46.7%	100.0%
Coloured	Count	51	22	124	197
	% within Racial group	25.9%	11.2%	62.9%	100.0%
Indian	Count	97	13	46	156
	% within Racial group	62.2%	8.3%	29.5%	100.0%
Others	Count	6	6	7	19
	% within Racial group	31.6%	31.6%	36.8%	100.0%
Total	Count	1 019	452	1 647	3 118

Bar Chart

Bar Chart

This year, are you studying?
- Full time
- Part time
- Not studying

Exclude retired
- Not employe
- Partially
- Full

Which racial group do you belong to?

Count

202
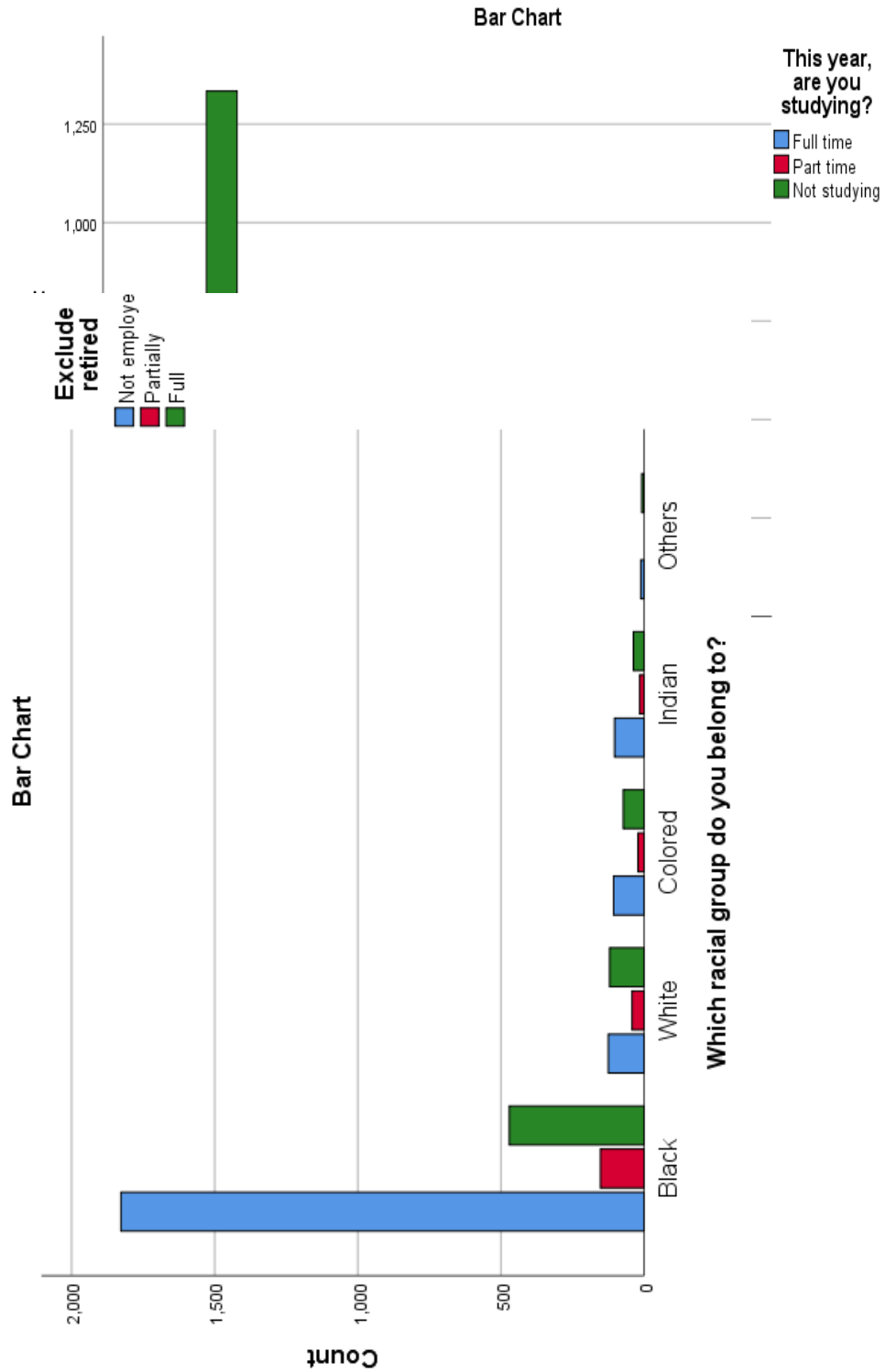
A high percentage of Indian respondents are studying full time but this is a relatively small section of the sample.

Symmetric Measures					
		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Nominal by Nominal	Phi	.171			.000
	Cramer's V	.121			.000
Ordinal by Ordinal	Kendall's tau-b	-.077	.017	-4.489	.000
No. of valid cases		3 118			
a. Not assuming the null hypothesis.					
b. Using the asymptotic standard error assuming the null hypothesis.					
According to Cramer's V this is a weak but significant relationship.					

G.4   Age * Currently studying

Age		Full time	Part time	Not studying	Total
61 plus	Count	< 5	< 5	< 5	< 5
	% within Age	$n < 5$	$n < 5$	$n < 5$	100.0%
51 to 60	Count	< 5	< 5	16	16
	% within Age	$n < 5$	$n < 5$	100.0%	100.0%
41 to 50	Count	7	16	65	88
	% within Age	8.0%	18.2%	73.9%	100.0%
31 to 40	Count	43	115	340	498
	% within Age	8.6%	23.1%	68.3%	100.0%
21 to 30	Count	763	300	1125	2188
	% within Age	34.9%	13.7%	51.4%	100.0%
18 to 20	Count	195	17	95	307
	% within Age	63.5%	5.5%	30.9%	100.0%
Total	Count	1 008	448	1 642	3 098
	% within Age	32.5%	14.5%	53.0%	100.0%

As could be expected, full time learners are young (30 years old or younger) and account for the largest segment of people studying (763 plus 195 out of 1008 full time learners). Part time learners are largely between the ages of 21 and 40 (300 plus 115 out of 448 part time learners).

The youngest Age category covers only three years, while the other categories each span 10 years – this might give the wrong impression – 195 full time learners are in the three year category 18 to 20 and 763 in the longer 21 to 30 group.

Symmetric Measures					
		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Nominal by Nominal	Phi	.319			.000
	Cramer's V	.226			.000
Ordinal by Ordinal	Kendall's tau-b	–.244	.014	–16.027	.000
No. of valid cases		3 098			
a. Not assuming the null hypothesis.					
b. Using the asymptotic standard error assuming the null hypothesis.					
According to Cramer's V this is a weak but significant relationship.					

Bar Chart

G.5 Highest education level * Currently studying

Highest education level		Full time	Part time	Not studying	Total
No formal education	Count	< 5	< 5	< 5	5
	% within Highest education level	$n < 5$	$n < 5$	$n < 5$	100.0%
Primary School	Count	< 5	< 5	17	18
	% within Highest	$n < 5$	$n < 5$	94.4%	100.0%

	education level				
Middle School	Count	71	17	210	298
	% within Highest education level	23.8%	5.7%	70.5%	100.0%
High School	Count	567	181	824	1572
	% within Highest education level	36.1%	11.5%	52.4%	100.0%
College	Count	184	124	320	628
	% within Highest education level	29.3%	19.7%	51.0%	100.0%
University Bachelor's Degree	Count	130	65	156	351
	% within Highest education level	37.0%	18.5%	44.4%	100.0%
Postgrad Diploma or Honours	Count	36	52	88	176
	% within Highest education level	20.5%	29.5%	50%	100.0%
Master's	Count	15	7	19	41
	% within Highest education level	36.6%	17.1%	46.3%	100.0%
PhD	Count	< 5	< 5	5	9
	% within Highest education level	$n < 5$	$n < 5$	55.6%	100.0%
Total	Count	1008	448	1642	3098
	% within Highest education level	32.5%	14.5%	53.0%	100.0%

The statistics for the highest education level (HEL) for those currently studying are worth a close scrutiny. Firstly, they may still be completing the qualification listed as their HEL. Apparently 71 full time learners (who must be older than 18 to take part in the survey) have only previously attended middle school.

Whereas only about 30% of those whose HEL is middle school are currently studying full or part time, 48% of respondents with HEL of High School are currently studying (this is the biggest group in terms of number), 49% with some college education are currently studying, 66% of those with (or working towards) a Bachelor's degree are currently studying. These totals drop slightly for higher degrees and the total numbers are low in those categories.

Symmetric Measures					
		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Nominal by Nominal	Phi	.187			.000
	Cramer's V	.132			.000
Ordinal by Ordinal	Kendall's tau-b	-.051	.016	-3.239	.001
No. of valid cases		3 075			

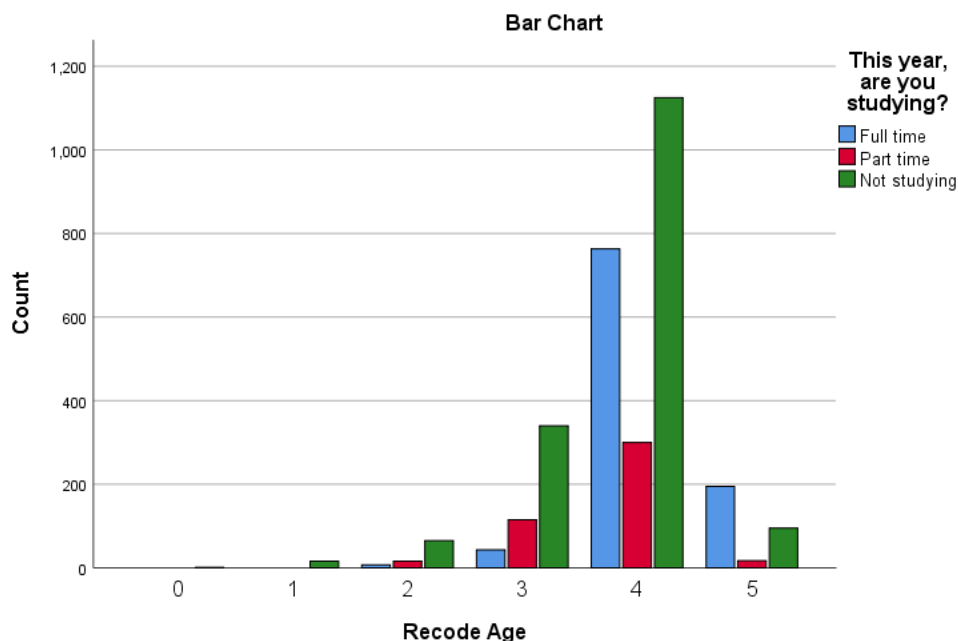|	
a. Not assuming the null hypothesis.	
b. Using the asymptotic standard error assuming the null hypothesis.	
According to Cramer's V this is a weak but significant relationship.	

Bar Chart

What is your highest education level
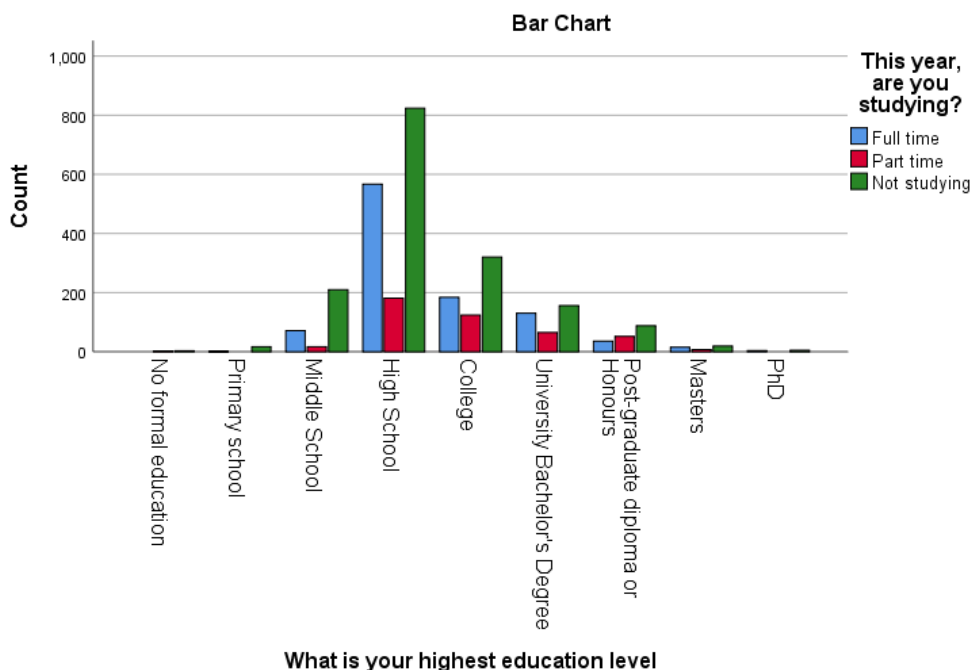
G.6 Most frequent internet access * Currently studying

Most frequent internet access		Full time	Part time	Not studying	Total
Do not access it all	Count	26	9	111	146
	% within Most frequent internet access	17.8%	6.2%	76.0%	100.0%
Friend's / Relative's house	Count	22	9	55	86
	% within Most frequent internet access	25.6%	10.5%	64.0%	100.0%
School / University or NEMISA CoLab	Count	213	22	20	255
	% within Most frequent internet access	83.5%	8.6%	7.8%	100.0%
Home or on my own mobile device	Count	614	256	1 035	1905
	% within Most frequent internet access	32.2%	13.4%	54.3%	100.0%

Cybercafe / Internet café	Count	18	16	100	134
	% within Most frequent internet access	13.4%	11.9%	74.6%	100.0%
Free Wi-F- zones including a public library	Count	100	74	170	344
	% within Most frequent internet access	29.1%	21.5%	49.4%	100.0%
Telecentre / Community centre	Count	7	20	29	56
	% within Most frequent internet access	12.5%	35.7%	51.8%	100.0%
Workplace	Count	8	41	114	163
	% within Most frequent internet access	4.9%	25.2%	69.9%	100.0%
Other	Count	8	5	6	19
	% within Most frequent internet access	42.1%	26.3%	31.6%	100.0%
Total	Count	1 016	452	1 640	3 108
	% within Most frequent internet access	32.7%	14.5%	52.8%	100.0%

Once again, mobile devices are the clear overall choice for accessing the Internet. Free WiFi zones and internet at work are used to some extent (but much less than mobile) by those not currently studying. However, for facilities at the institutions where they are studying are important for only about 20% of those studying full time (1 016 respondents) and free Wi-Fi zones by about 10% of the respondents in this group.

Symmetric Measures					
		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Nominal by Nominal	Phi	.391			.000
	Cramer's V	.276			.000
Ordinal by Ordinal	Kendall's tau-b	.130	.015	8.405	.000
No. of valid cases		3 108			
a. Not assuming the null hypothesis.					
b. Using the asymptotic standard error assuming the null hypothesis.					
According to Cramer's V this is a weak but significant relationship.					

Bar Chart

This year, are you studying?
- Full time
- Part time
- Not studying

Where do you access the Internet most frequently?
- Other
- Workplace
- Telecentre/ community centre
- Free WIFI zones including a public library
- Cybercafe/Internet cafe
- Home or on my own mobile device
- School/ university or NEMISA coLab
- Friend's/ relative's house
- Do not access it all

Count

Addendum H

A: Cross-tabulations between other demographics and I have previously registered for an online course

B: Cross-tabulations between other demographics and previous completion of online learning

Notes:

- See Section 3.3.4 for a full discussion.

- These cross-tabulations are shown together to allow for comparison.

The measure for completion was calculated using the mean value for three questions each of which had a Yes (score = 1) or No (score = 0) answer. A score of 1 indicates all three questions had a Yes for completion; a score of .7 indicates that two of the three received a Yes answer; and a score of 0.5 is impossible.

H.1   Province * Registered previously for a short course (REG0)

Province		No	Yes	Total
Gauteng	Count	494	365	859
	% within Province	57.5%	42.5%	100.0%
KwaZulu-Natal	Count	398	177	575
	% within Province	69.2%	30.8%	100.0%
Free State	Count	109	50	159
	% within Province	68.6%	31.4%	100.0%
Eastern Cape	Count	280	83	363
	% within Province	77.1%	22.9%	100.0%
Limpopo	Count	221	82	303
	% within Province	72.9%	27.1%	100.0%
Mpumalanga	Count	149	78	227
	% within Province	65.6%	34.4%	100.0%
North West	Count	148	77	225
	% within Province	65.8%	34.2%	100.0%
Northern Cape	Count	51	12	63
	% within Province	81.0%	19.0%	100.0%
Western Cape	Count	287	76	363
	% within Province	79.1%	20.9%	100.0%
Total	Count	2137	1000	3137
	% within Province	68.1%	31.9%	100.0%
	% of Total	68.1%	31.9%	100.0%

Highest in Gauteng – why? Lowest in Northern Cape, Eastern Cape and Western Cape.

Symmetric Measures		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Nominal by Nominal	Phi	.167			.000
	Cramer's V	.167			.000
Ordinal by Ordinal	Kendall's tau-b	–.115	.016	–7.334	.000
No. of valid cases		3 137			
a. Not assuming the null hypothesis.					
b. Using the asymptotic standard error assuming the null hypothesis.					
According to Cramer's V this is a weak but significant relationship.					

Bar Chart

H.2 Province * Completed a short course (Mean CPL)

Province		Mean CPL					Total
		.0	.3	.5	.7	1.0	
Gauteng	Count	497	164	< 5	135	61	859
	% within Province	57.9%	19.1%	n < 5	15.7%	7.1%	100.0%
KwaZulu-Natal	Count	448	44	< 5	50	33	575
	% within Province	77.9%	7.7%	n < 5	8.7%	5.7%	100.0%
Free State	Count	108	23	< 5	22	7	160
	% within Province	67.5%	14.4%	n < 5	13.8%	4.4%	100.0%
Eastern Cape	Count	280	30	< 5	39	14	363

	% within Province	77.1%	8.3%	*n* < 5	10.7%	3.9%	100.0%
Limpopo	Count	228	42	< 5	20	14	304
	% within Province	75.0%	13.8%	*n* < 5	6.6%	4.6%	100.0%
Mpumalanga	Count	135	33	< 5	29	29	227
	% within Province	59.5%	14.5%	*n* < 5	12.8%	12.8%	100.0%
North West	Count	167	28	< 5	17	14	226
	% within Province	73.9%	12.4%	*n* < 5	7.5%	6.2%	100.0%
Northern Cape	Count	57	< 5	< 5	< 5	< 5	63
	% within Province	90.5%	*n* < 5	*n* < 5	*n* < 5	*n* < 5	100.0%
Western Cape	Count	294	11	< 5	38	19	362
	% within Province	81.2%	3.0%		10.5%	5.2%	100.0%
Total	Count	2214	379	< 5	351	192	3139
	% within Province	70.5%	12.1%	*n* < 5	11.2%	6.1%	100.0%

Highest completion also in Gauteng. Lowest in Northern Cape and Western Cape. Apparently a correlation between registration and completion.

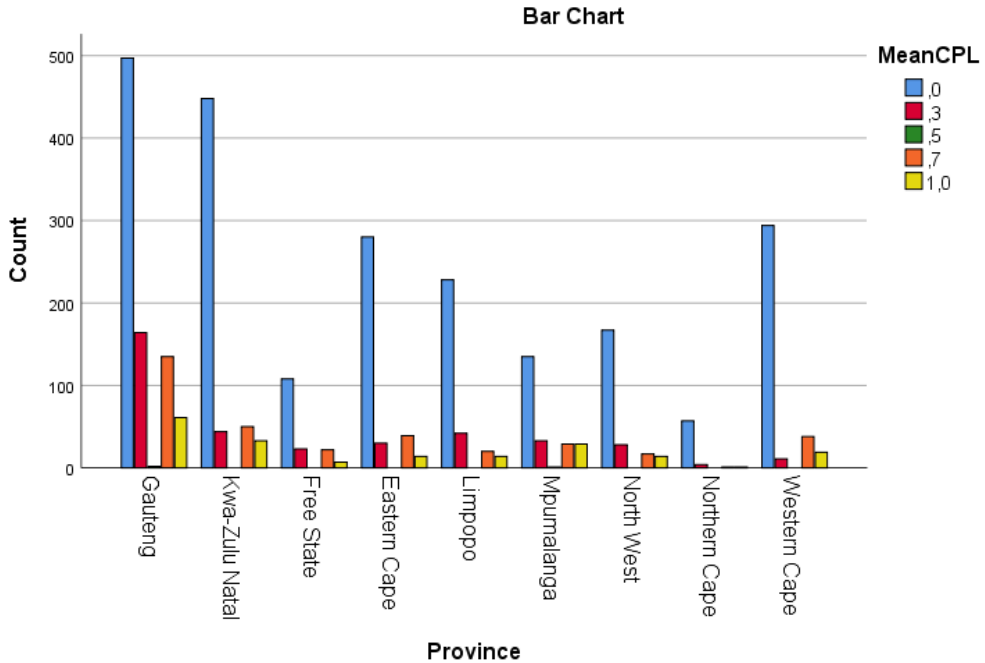| **Symmetric Measures**					
		Value	**Asymptotic Standard Error[a]**	**Approximate T[b]**	**Approximate Significance**
Nominal by Nominal	Phi	.243			.000
	Cramer's V	.121			.000
Ordinal by Ordinal	Kendall's tau-b	–.105	.015	–6.966	.000
No. of valid cases		3 139			
a. Not assuming the null hypothesis.					
b. Using the asymptotic standard error assuming the null hypothesis.					
According to Cramer's V this is a weak but significant relationship.					

Bar Chart

H.3 Gender * Registered previously for a short course (REG0)

Gender		No	Yes	Total
Male	Count	1 038	485	1 523
	% within Gender	68.2%	31.8%	100.0%
Female	Count	1 091	515	1 606
	% within Gender	67.9%	32.1%	100.0%
Total	Count	2 129	1 000	3 129
	% within Gender	68.0%	32.0%	100.0%

As with the case for gender and post primary education there is **no** significant difference between genders in terms of online short course registration reported for females and males. It seems that in South Africa females and males already have equal opportunities to access **all** levels of education and online courses compared with males.

Symmetric Measures		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Nominal by Nominal	Phi	.002			.894
	Cramer's V	.002			.894
Ordinal by Ordinal	Kendall's tau-b	.002	.018	.133	.894
No. of valid cases		3 129			
a. Not assuming the null hypothesis.					

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b. Using the asymptotic standard error assuming the null hypothesis.
NB: No significant differences by gender. This is different from most of the other cross-tabulations' Cramer's V significance.

Bar Chart
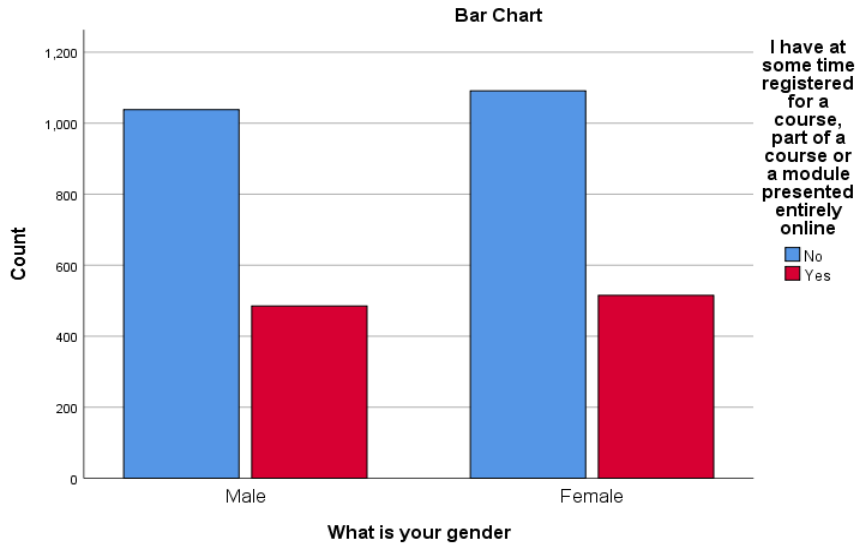
H.4   Gender * Completed short course (Mean CPL)

Gender		Mean CPL					Total
		.0	.3	.5	.7	1.0	
Male	Count	1 067	193	< 5	180	84	1 526
	% within Gender	69.9%	12.6%	$n < 5$	11.8%	5.5%	100.0%
Female	Count	1 139	186	< 5	171	108	1 605
	% within Gender	71.0%	11.6%	$n < 5$	10.7%	6.7%	100.0%
Total	Count	2 206	379	< 5	351	192	3 131
	% within Gender	70.5%	12.1%	$n < 5$	11.2%	6.1%	100.0%

Interestingly, there is also **no** significant difference between gender and reported completion of online short courses. In other words, approximately the same numbers of females and males completed the courses.

Symmetric Measures					
		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Nominal by Nominal	Phi	.036			.399
	Cramer's V	.036			.399

Ordinal by Ordinal	Kendall's tau-b	-.007	.017	-.385	.700
No. of valid cases		3 131			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

NB: No significant differences by gender. This is different from most of the other cross – tabulations' Cramer V significance.

Bar Chart
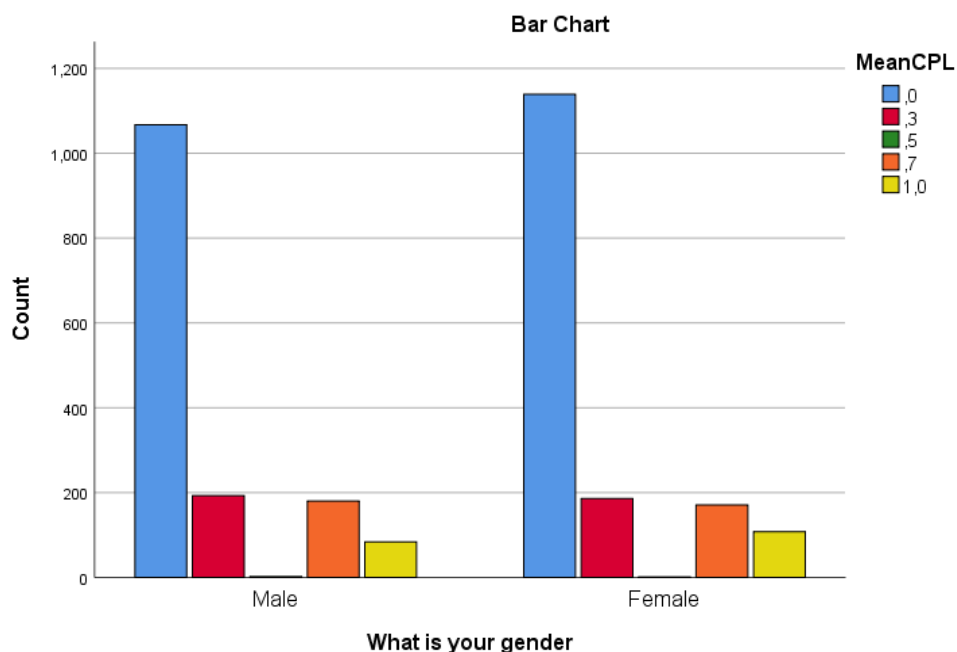
H.5   Racial group * Registered previously for a short course (REG0)

Racial group		No	Yes	Total
Black	Count	1 691	772	2 463
	% within Racial group	68.7%	31.3%	100.0%
White	Count	171	121	292
	% within Racial group	58.6%	41.4%	100.0%
Coloured	Count	147	51	198
	% within Racial group	74.2%	25.8%	100.0%
Indian	Count	110	48	158
	% within Racial group	69.6%	30.4%	100.0%
Others	Count	12	7	19
	% within Racial group	63.2%	36.8%	100.0%
Total	Count	2 131	999	3 130
	% within Racial group	68.1%	31.9%	100.0%

Previous registrations for online short courses are highest in the White racial group (41.4% of respondents in this group said they had registered for such a course and low (between 25.8% for the Coloured group and 31.3% for the Black group) in all other groups.

Symmetric Measures		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Nominal by Nominal	Phi	.072			.003
	Cramer's V	.072			.003
Ordinal by Ordinal	Kendall's tau-b	.016	.017	.940	.347
No. of valid cases		3 130			
a. Not assuming the null hypothesis.					
b. Using the asymptotic standard error assuming the null hypothesis.					
According to Cramer's V this is a weak but significant relationship.					

Bar Chart

H.6   Racial group * Completed a short course (Mean CPL)

Racial group		Mean CPL					Total
		.0	.3	.5	.7	1.0	
Black	Count	1 741	311	< 5	252	159	2 466
	% within Racial group	70.6%	12.6%	n < 5	10.2%	6.4%	100.0%
White	Count	180	29	< 5	60	23	292
	% within	61.6%	9.9%	n < 5	20.5%	7.9%	100.0%

	Racial group					
Coloured	Count	155	16	< 5	20	6	197
	% within Racial group	78.7%	8.1%	$n < 5$	10.2%	3.0%	100.0%
Indian	Count	120	18	< 5	16	< 5	158
	% within Racial group	75.9%	11.4%	$n < 5$	10.1%	$n < 5$	100.0%
Others	Count	14	< 5	< 5	< 5	< 5	19
	% within Racial group	73.7%	$n < 5$	$n < 5$	$n < 5$	$n < 5$	100.0%
Total	Count	2 210	377	< 5	350	192	3 132
	% within Racial group	70.6%	12.0%	$n < 5$	11.2%	6.1%	100.0%

A similar result to that for registrations is obtained regarding completion of online short courses.

Symmetric Measures					
		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Nominal by Nominal	Phi	.121			.000
	Cramer's V	.061			.000
Ordinal by Ordinal	Kendall's tau-b	−.004	.016	−.263	.792
No. of valid cases		3 132			
a. Not assuming the null hypothesis.					
b. Using the asymptotic standard error assuming the null hypothesis.					
According to Cramer's V this is a weak but significant relationship.					

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H.7   Age * Registered previously for a short course (REG0)

Bar Chart

Age		No	Yes	Total
61 plus	Count	1	0	1
	% within Age	100.0%	0.0%	100.0%
51 to 60	Count	11	5	16
	% within Age	68.8%	31.3%	100.0%
41 to 50	Count	60	29	89
	% within Age	67.4%	32.6%	100.0%
31 to 40	Count	311	189	500
	% within Age	62.2%	37.8%	100.0%
21 to 30	Count	1 493	705	2 198
	% within Age	67.9%	32.1%	100.0%
18 to 20	Count	245	61	306
	% within Age	80.1%	19.9%	100.0%
Total	Count	2 121	989	3 110
	% within Age	68.2%	31.8%	100.0%

In terms of Age, registrations are spread fairly evenly in the 21 to 30, 41 to 50 and 51 to 60 groups at between 31.3% and 32.6%. The reported significant difference is due to the increase to 37.8% reported in the group 31 to 40. There is low interest in the youngest group.

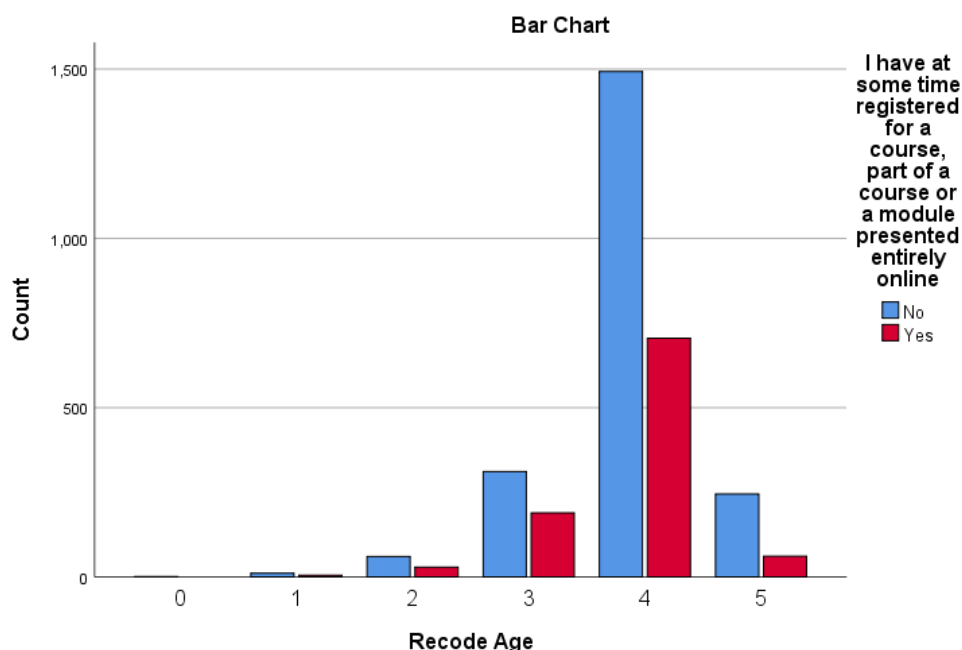| Symmetric Measures					
		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Nominal by Nominal	Phi	.096			.000
	Cramer's V	.096			.000
Ordinal by Ordinal	Kendall's tau-b	-.080	.017	-4.720	.000
No. of valid cases		3 110			
a. Not assuming the null hypothesis.					
b. Using the asymptotic standard error assuming the null hypothesis.					
According to Cramer's V this is a weak but significant relationship.					

Bar Chart

H.8 Age * Completed a short course (Mean CPL)

Age		Mean CPL					Total
		.0	.3	.5	.7	1.0	
61 plus	Count	< 5	< 5	< 5	< 5	< 5	< 5
	% within Recode age	n < 5	n < 5	n < 5	n < 5	n < 5	100.0%
51 to 60	Count	12	< 5	< 5	< 5	< 5	16
	% within Recode age	75.0%	n < 5	n < 5	n < 5	n < 5	100.0%
41 to 50	Count	61	5	< 5	15	7	89

		68.5%	5.6%	*n* < 5	16.9%	7.9%	100.0%
	% within Recode age						
31 to 40	Count	318	63	< 5	72	48	502
	% within Recode age	63.3%	12.5%	*n* < 5	14.3%	9.6%	100.0%
21 to 30	Count	1 550	285	< 5	238	124	2 198
	% within Recode age	70.5%	13.0%	*n* < 5	10.8%	5.6%	100.0%
18 to 20	Count	254	25	< 5	19	8	306
	% within Recode age	83.0%	8.2%	*n* < 5	6.2%	2.6%	100.0%
Total	% within Recode age	2 196	378	< 5	347	188	3 112
	% within Recode age	70.6%	12.1%	*n* < 5	11.2%	6.0%	100.0%

In contrast with registrations, the age groups from 31 to 40 and 41 to 50 are most likely to complete the courses registered for.

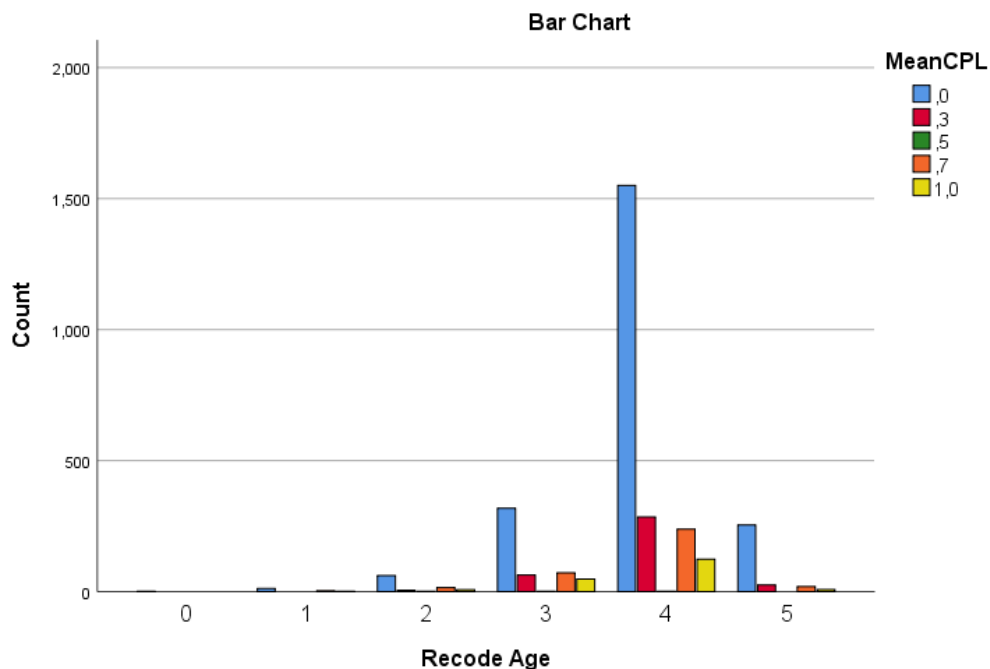| **Symmetric Measures**					
		Value	**Asymptotic Standard Error[a]**	**Approximate T[b]**	**Approximate Significance**
Nominal by Nominal	Phi	.144			.000
	Cramer's V	.072			.000
Ordinal by Ordinal	Kendall's tau-b	–.097	.016	–5.903	.000
No. of valid cases		3 112			
a. Not assuming the null hypothesis.					
b. Using the asymptotic standard error assuming the null hypothesis.					
According to Cramer's V this is a weak but significant relationship.					

Bar Chart

H.9 Highest education level * Registered previously for a short course (REG0)

Highest education level		No	Yes	Total
Middle School	Count	236	62	298
	% within Highest education level	79.2%	20.8%	100.0%
High School	Count	1 136	441	1 577
	% within Highest education level	72.0%	28.0%	100.0%
College	Count	417	211	628
	% within Highest education level	66.4%	33.6%	100.0%
University Bachelor's Degree	Count	187	165	352
	% within Highest education level	53.1%	46.9%	100.0%
Postgrad Diploma or Honours	Count	117	109	226
	% within Highest education level	51.8%	48.2%	100.0%
Total	Count	2 093	988	3 081
	% within Highest education level	67.9%	32.1%	100.0%

Based on reported previous registrations, it seems that those currently studying for a university degree (at Bachelor's level or postgraduate) are most likely to register for an online short course.

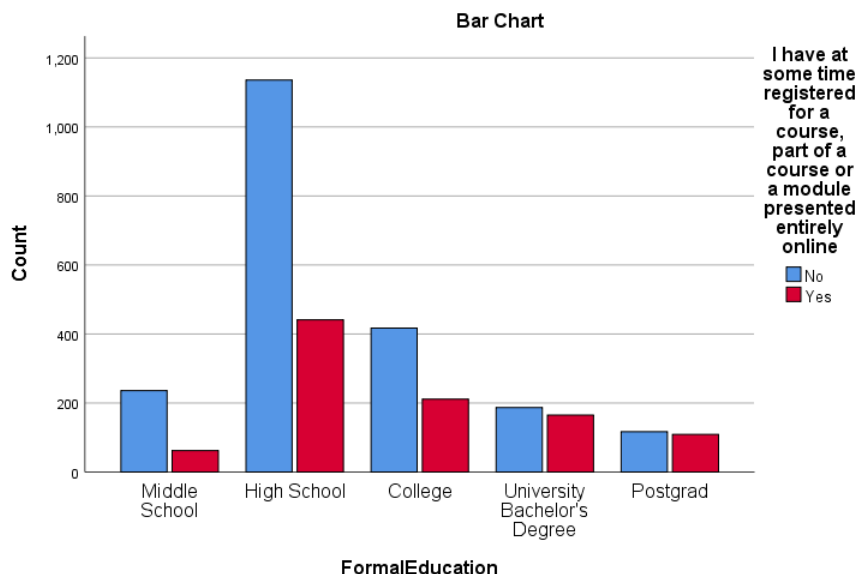| Symmetric Measures		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Nominal by Nominal	Phi	.173			.000
	Cramer's V	.173			.000
Ordinal by Ordinal	Kendall's tau-b	.151	.017	9.045	.000
No. of valid cases		3 081			
a. Not assuming the null hypothesis.					
b. Using the asymptotic standard error assuming the null hypothesis.					
According to Cramer's V this is a weak but significant relationship.					

Bar Chart

H.10   Highest education level * Completed a short course (Mean CPL)

Highest education level		Mean CPL					Total
		.0	.3	.5	.7	1.0	
Middle School	Count	238	18	< 5	24	17	297
	% within	80.1%	6.1%	$n < 5$	8.1%	5.7%	100.0%

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	Highest education level					
High School	Count	1197	176	< 5	136	67	1578
	% within Highest education level	75.9%	11.2%	$n < 5$	8.6%	4.2%	100.0%
College	Count	437	81	< 5	75	36	629
	% within Highest education level	69.5%	12.9%	$n < 5$	11.9%	5.7%	100.0%
University Bachelor's Degree	Count	181	60	< 5	72	39	352
	% within Highest education level	51.4%	17.0%	$n < 5$	20.5%	11.1%	100.0%
Postgrad Diploma or Honours	Count	115	41	< 5	41	29	227
	% within Highest education level	50.7%	18.1%	$n < 5$	18.1%	12.8%	100.0%
Total	Count	2168	376	< 5	348	188	3083
	% within Highest education level	70.3%	12.2%	$n < 5$	11.3%	6.1%	100.0%

Similar to registrations, based on reported previous completion, it seems that those currently studying for a university degree (at Bachelor's level or postgraduate) are most likely to complete an online short course.

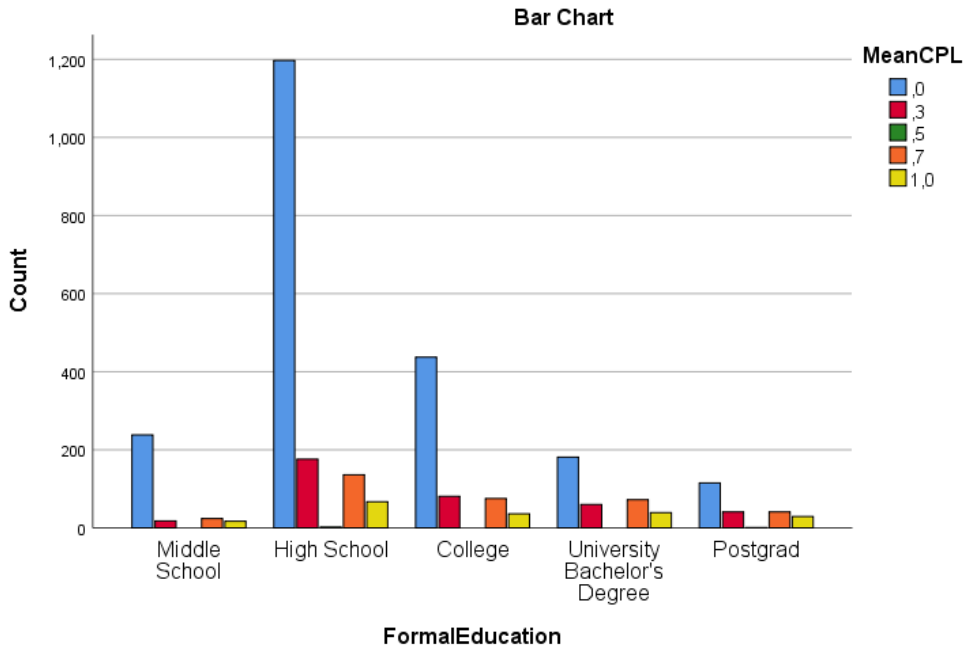| Symmetric Measures		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Nominal by Nominal	Phi	.226			.000
	Cramer's V	.113			.000
Ordinal by Ordinal	Kendall's tau-b	.172	.016	10.381	.000
No. of valid cases		3 083			
a. Not assuming the null hypothesis.					
b. Using the asymptotic standard error assuming the null hypothesis.					
According to Cramer's V this is a weak but significant relationship.					

H.11 I have at some time registered for a course, part of a course or a module presented entirely online * This year, are you studying?

Currently studying		No	Yes	Total
Full time	Count	685	333	1 018
	% within Currently studying	67.3%	32.7%	100.0%
Part time	Count	225	226	451
	% within Currently studying	49.9%	50.1%	100.0%
Not studying	Count	1 214	433	1 647
	% within Currently studying	73.7%	26.3%	100.0%
Total	Count	2 124	992	3 116
	% within Currently studying	68.2%	31.8%	100.0%

Slightly less than a third of those studying full time claim to have registered at some time (not necessarily while studying elsewhere) for a short online course. Also exactly 50% of those studying part-time claim to have registered at some time (not necessarily while studying elsewhere). About a quarter of those who are currently not studying claim to have registered at some time.

Symmetric Measures

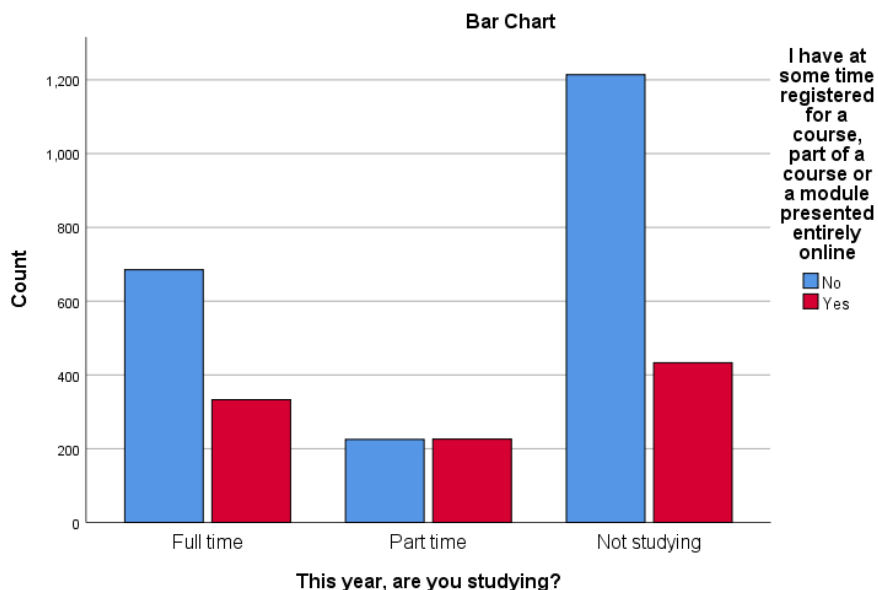|		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Nominal by Nominal	Phi	.173			.000
	Cramer's V	.173			.000
Ordinal by Ordinal	Kendall's tau-b	-.083	.017	-4.912	.000
No. of valid cases		3 116			
a. Not assuming the null hypothesis.					
b. Using the asymptotic standard error assuming the null hypothesis.					
According to Cramer's V this is a weak but significant relationship.					

Bar Chart

This year, are you studying?

I have at some time registered for a course, part of a course or a module presented entirely online

■ No
■ Yes

H.12 Currently studying * Completed a short course (Mean CPL)

Currently studying		Mean CPL					Total
		.0	.3	.5	.7	1.0	
Full time	Count	714	140	< 5	122	42	1 018
	% within Currently studying?	70.1%	13.8%	$n < 5$	12.0%	4.1%	100.0%
Part time	Count	224	103	< 5	74	50	452
	% within Currently studying?	49.6%	22.8%	$n < 5$	16.4%	11.1%	100.0%
Not	Count	1 261	134	< 5	152	98	1 647

studying	% within Currently studying?	76.6%	8.1%	$n < 5$	9.2%	6.0%	100.0%
Total	Count	2 199	377	< 5	348	190	3 117
	% within Currently studying?	70.5%	12.1%	$n < 5$	11.2%	6.1%	100.0%

These results are interesting. About 16% of those studying full time claim to have completed a short online course (CPL Mean score of 0.7 or 1.0) at some time (not necessarily while studying elsewhere). Compare this with the 32.7% who say they registered. About 27.5% of those studying part-time claim they completed a short online course (not necessarily while studying elsewhere). Compare this with the 50.1% who say they registered. About 15% of those who are currently not studying claim to have registered at some. Compare this with the 31.8% who say they registered. Hence, the persistence rates for these three groups are: Full-time learners' completion rate is 49.2%; Part-time learners' completion rate is 54.8%; Not studying completion rate is 57.7%.

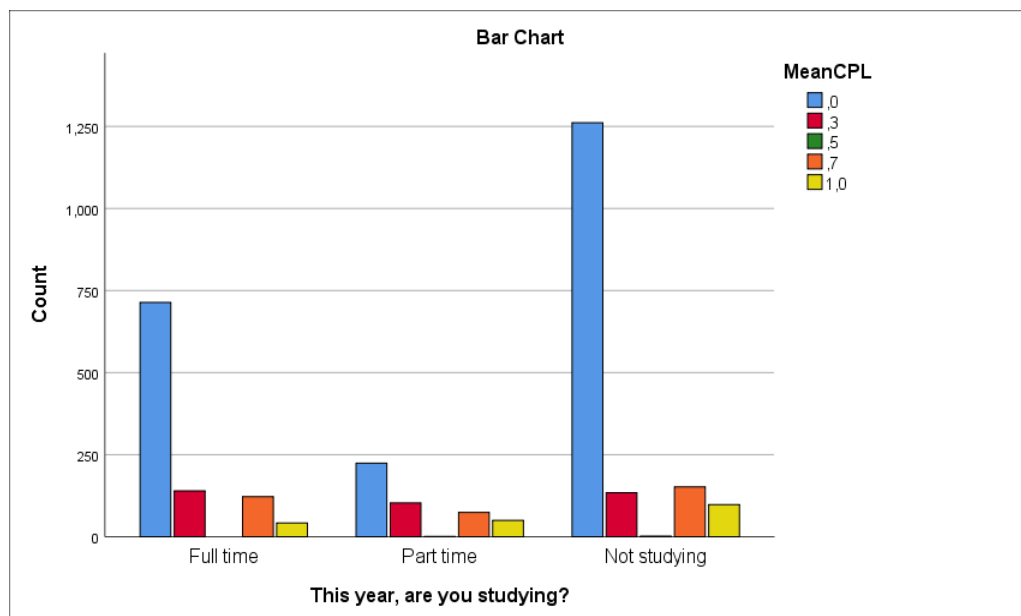| Symmetric Measures					
		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Nominal by Nominal	Phi	.217			.000
	Cramer's V	.153			.000
Ordinal by Ordinal	Kendall's tau-b	–.071	.016	–4.444	.000
No. of valid cases			3 117		
a. Not assuming the null hypothesis.					
b. Using the asymptotic standard error assuming the null hypothesis.					
According to Cramer's V this is a weak but significant relationship.					

Bar Chart

H.13 Most frequent internet access * Registered previously for a short course (REG0)

Most frequent internet access		No	Yes	Total
Do not access it all	Count	101	42	143
	% within Most frequent internet access	70.6%	29.4%	100.0%
Friend's / Relative's house	Count	69	17	86
	% within Most frequent internet access	80.2%	19.8%	100.0%
School / University or NEMISA CoLab	Count	172	84	256
	% within Most frequent internet access	67.2%	32.8%	100.0%
Home or on my own mobile device	Count	1 310	601	1 911
	% within Most frequent internet access	68.6%	31.4%	100.0%
Cybercafe / Internet café	Count	99	35	134
	% within Most frequent internet access	73.9%	26.1%	100.0%
Free Wi-Fi zones including a public library	Count	225	120	345
	% within Most frequent internet access	65.2%	34.8%	100.0%
Telecentre / Community centre	Count	31	24	55
	% within Most frequent internet access	56.4%	43.6%	100.0%
Workplace	Count	108	56	164

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		65.9%	34.1%	100.0%
Other	Count	9	10	19
	% within Most frequent internet access	47.4%	52.6%	100.0%
Total	Count	2 124	989	3 113
	% within Most frequent internet access	68.2%	31.8%	100.0%

Of those who registered at some time for a short online course, a large number of public places are used often (selected by more than 30% of respondents who have registered) to access the internet. These public places are: School/ university or NEMISA CoLab 32.8%; Free WIFI zones including a public library 34.8% and Telecentre / Community centre (43.6%). Note that respondents were asked to select only one option. There is, however, an anomaly as 29.4% of the respondents claim to have registered for such courses but say that they did not use the internet at all!

Unlike previous analyses of internet access in this report, while mobile devices are equal in popularity to these afore mentioned public spaces with 31.4% selecting this option, it is not the overwhelming favourite choice.

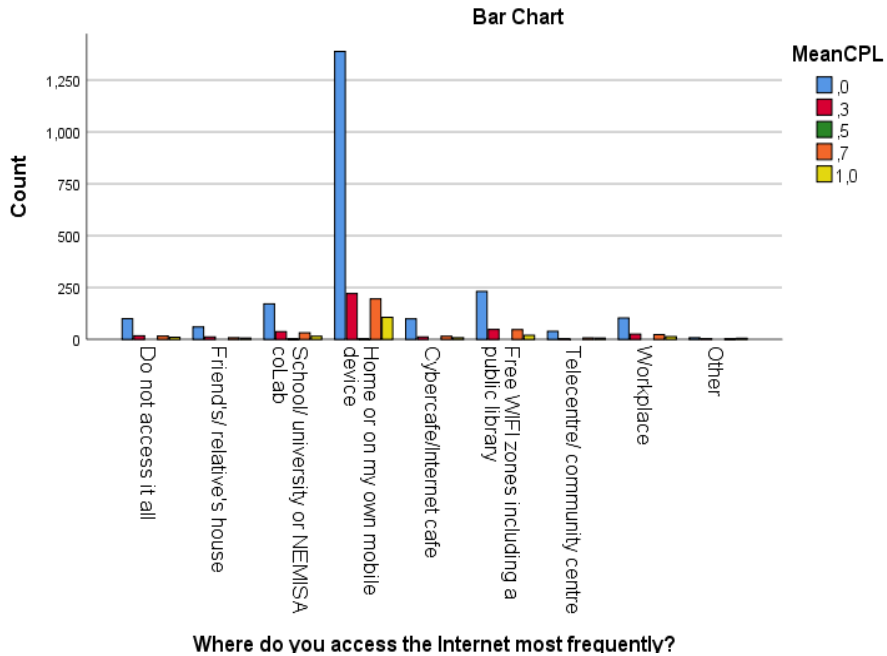| Symmetric Measures					
		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Nominal by Nominal	Phi	.075			.025
	Cramer's V	.075			.025
Ordinal by Ordinal	Kendall's tau-b	.034	.017	2.064	.039
No. of valid cases		3 113			
a. Not assuming the null hypothesis.					
b. Using the asymptotic standard error assuming the null hypothesis.					
According to Cramer's V this is a weak but significant relationship.					

Bar Chart

Where do you access the Internet most frequently?

H.14 Most frequent internet access * Completed a short course (Mean CPL)

Most frequent internet access		Mean CPL					Total
		.0	.3	.5	.7	1.0	
Do not access it at all	Count	100	17	< 5	16	10	143
	% within Most frequent internet access	69.9%	11.9%	$n < 5$	11.2%	7.0%	100.0%
Friend's/ relative's house	Count	60	12	< 5	8	6	86
	% within Most frequent internet access	69.8%	14.0%	$n < 5$	9.3%	7.0%	100.0%
School / University or NEMISA CoLab	Count	171	37	< 5	32	15	256
	% within Most frequent internet access	66.8%	14.5%	$n < 5$	12.5%	5.9%	100.0%
Home or on my own mobile device	Count	1388	221	< 5	195	106	1912
	% within Most frequent internet access	72.6%	11.6%	$n < 5$	10.2%	5.5%	100.0%
Cybercafe / Internet cafe	Count	99	12	< 5	15	8	134
	% within Most frequent internet access	73.9%	9.0%	$n < 5$	11.2%	6.0%	100.0%
Free Wi-Fi zones	Count	231	48	< 5	47	20	346

228

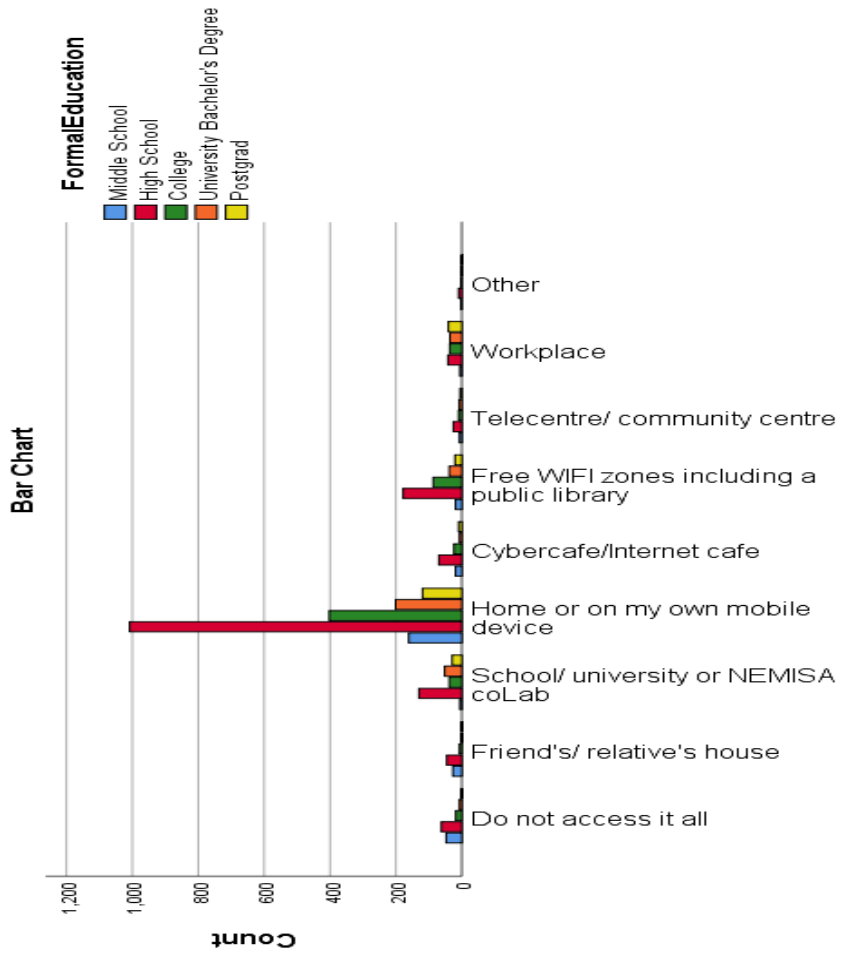|							
including a public library	% within Most frequent internet access	66.8%	13.9%	$n < 5$	13.6%	5.8%	100.0%
Telecentre/ Community centre	Count	39	< 5	< 5	7	6	55
	% within Most frequent internet access	70.9%	$n < 5$	$n < 5$	12.7%	10.9%	100.0%
Workplace	Count	103	25	< 5	23	13	164
	% within Most frequent internet access	62.8%	15.2%	$n < 5$	14.0%	7.9%	100.0%
Other	Count	8	< 5	< 5	< 5	5	19
	% within Most frequent internet access	42.1%	$n < 5$	$n < 5$	$n < 5$	26.3%	100.0%
Total	Count	2 199	379	< 5	345	189	3 115
	% within Most frequent internet access	70.6%	12.2%	$n < 5$	11.1%	6.1%	100.0%

Of the respondents who say they have successfully completed short online courses, Telecentre / Community centre (23.6%) and Workplace (21.9%) are slightly more popular options while own mobile (15.7%) and friend or relative's house (16.3%) are the least popular. This is an extremely important set of findings. Whereas internet access for entertainment or social networking and communication may be extremely popular, this set of results indicate that it may not be as useful for studying online courses.
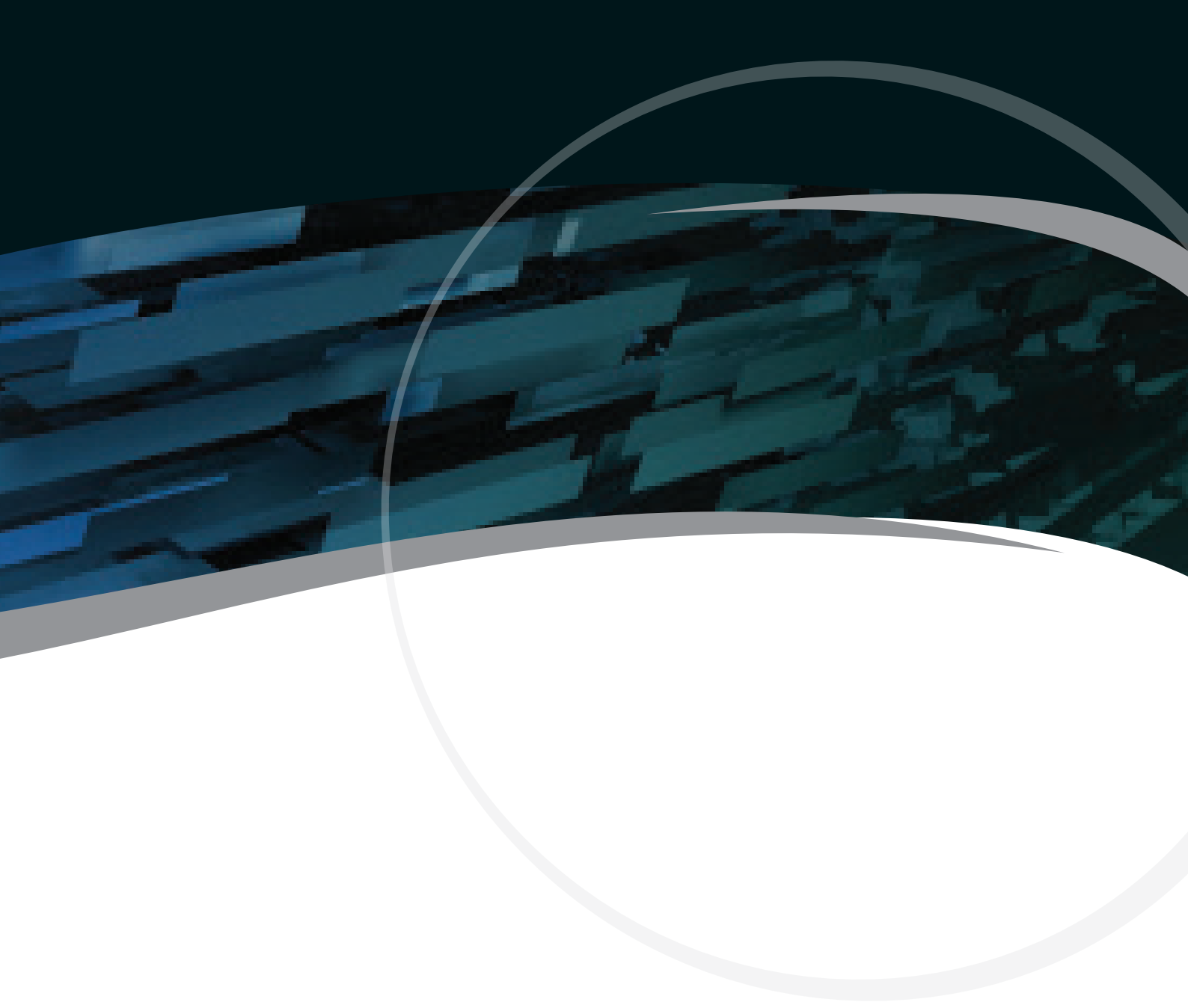
Symmetric Measures					
		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Nominal by Nominal	Phi	.114			.147
	Cramer's V	.057			.147
Ordinal by Ordinal	Kendall's tau-b	.025	.017	1.507	.132
No. of valid cases		3 115			
a. Not assuming the null hypothesis.					
b. Using the asymptotic standard error assuming the null hypothesis.					
According to Cramer's V this is a weak but significant relationship.					

Bar Chart

MeanCPL
- ,0
- ,3
- ,5
- ,7
- 1,0

Where do you access the Internet most frequently?

Symmetric Measures					
		Value	**Asymptotic Standard Errora**	**Approximate Tb**	**Approximate Significance**
Nominal by Nominal	Phi	.342			.000
	Cramer's V	.171			.000
Ordinal by Ordinal	Kendall's tau-b	.112	.016	6.727	.000
No. of valid cases		3 074			
a. Not assuming the null hypothesis.					
b. Using the asymptotic standard error assuming the null hypothesis.					
According to Cramer's V this is a weak but significant relationship.					

Bar Chart

FormalEducation

- Middle School
- High School
- College
- University Bachelor's Degree
- Postgrad

Other

Workplace

Telecentre/ community centre

Free WIFI zones including a public library

Cybercafe/Internet cafe

Home or on my own mobile device

School/ university or NEMISA coLab

Friend's/ relative's house

Do not access it all

Count

1,200
1,000
800
600
400
200
0

Where do you access the Internet most frequently?