

The Perceived Motivational Impact of Voice-over-PowerPoint™ on Part-time Adult Learners in a Distance Learning Environment

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Abstract

The primary purpose of this study was to determine whether well-designed instructional material based on motivational theory and blended learning theory has the intended impact on the learning motivation of adult learners in a distance education environment. This study used Voice-over-PowerPoint™ technology as a medium to deliver subject specific instruction based on motivational theory as supplementary content to the course curriculum. This empirical study was conducted over a period of approximately two months on a sample of 57 adult learners who were enrolled for a distance education course for non-degree purposes at a tertiary education institution. Quantitative research methods were applied and data was collected using two motivation-measuring surveys: (1) The Course Interest Survey; and (2) The Instructional Materials Motivation Survey, which were both developed by Keller. Motivational strategies were designed for the chosen educational technology, Voice-over-PowerPoint™ (VoP) videos, using Keller's Attention, Relevance, Confidence and Satisfaction (ARCS) model of motivation. These strategies were then delivered via the learner management system for learners to use at their convenience. This research suggests that overall, learner motivation can be affected by external conditions such as well-designed instructional material, and further supports the ARCS model. Furthermore, the use of VoP videos as a viable medium for delivering motivational strategies in a blended, distance learning environment was validated.

Keywords: Distance education, adult learning, blended learning, motivation, ARCS Model, Accounting education, Taxation education

1. Introduction

As the educational landscape shifts to one of life-long learning¹, through numerous mediums, we as educators are faced with the challenge of motivating learners, to increase their probability of success, in a ‘connected’ yet isolated environment.

Higher education has transformed from elite to mass education with the aid of educational technologies and the open access philosophy adopted by many. Mega-universities have evolved as a result of the increasing demand for access to higher education (Trow 1999), sparking an increase in the use of distance education² and its many derivatives (e-learning³; m-learning⁴; blended/ hybrid learning⁵, etc.).

Distance education has historically dealt with lower success rates than its traditional counterpart. The ever increasing demand resulting from open access and the ‘connectedness’ of the world nowadays has further contributed to the poor completion or throughput rates of distance based education. The challenges that distance learners face with regard to achieving academic success exist at an individual level (i.e. motivation, ability, academic preparedness, other personal characteristics, finances, and personal circumstances), at an institutional level (i.e. the quality of service and guidance provided), and at a pervasive level (i.e. socio-political and socio-economic

¹ Life-long learning is defined as formal and informal learning opportunities to foster continuous development and improvement in adult learners.

² Distance education is simplistically described as the separation of educators and learners by space and/or time, including traditional distance education (paper-based), technology based learning (e-learning), mobile learning (m-learning), a mixture of distance or face to face learning blended with technology enhanced learning (blended/hybrid learning), etcetera.

³ e-learning is the delivery of learning, training or an education program by electronic means (also referred to as online training or learning)

⁴ m-learning or mobile learning is defined as education or training through the use of portable wireless devices such as mobile phones, personal digital assistants, personal computers and small tablet PCs, to achieve the goal of mobility and interactivity.

⁵ Blended or hybrid learning describes e-learning is being combined with traditional classroom methods and independent study to create a new, hybrid teaching methodology.

factors) (Subotzky & Prinsloo 2011; Moodley & Singh 2015; Khoza & Manik 2015). Learner success is a highly complex challenge with many variables, one of which is motivation.

Motivation is an integral part of academic success and learning, especially in distance education where learners must be active and self-directed participants in their learning (Lee 2000; Strage 1999; Pascarella & Terenzini 1991). Distance learners are generally less motivated than traditional learners due, in part, to the distance or isolation that they experience (Qureshi, Morton & Antosz 2002; Inoue, as cited in Bolliger, Supanakorn & Boggs 2010). This distance is often referred to as transactional distance, being the gap or miss understanding between what the learner understood and what the educator intended to convey (Moore 1993). Implementing interventions that decrease this gap or distance creates a transactional presence that in turn fosters better understanding and may motivate learners.

Prior studies have proved that external conditions (for example instruction method and materials) can influence learner motivation (Moller 1993; Huett 2006; Gabrielle 2003; L. Visser 1998; Song & Keller 2001). Prior research has also established that the use of educational technology personalises learning by giving a voice or putting a face to the learning experience through the creation of a transactional (virtual) presence, and thereby decreasing transactional distance (Lee, Tan & Goh 2004; Van Oordt & Mulder 2016).

This Voice-over-PowerPoint™ (VoP) video study was designed to determine whether well-designed instructional material based on motivational theory and blended learning theory has the intended impact on the learning motivation of adult learners in a distance education environment.

The instructional methods undertaken in this study are well supported in the scholarly literature. Bolliger, Supanakorn and Boggs (2010) used Keller's ARCS model to develop podcasts in an online environment, the results of which indicate that overall, the users of these podcasts' motivation increased. Keller developed the ARCS model of motivation to solve instructional problems related to a learners' motivation to learn (Keller 1979; Keller 1987a; Keller 1987b). ARCS stands for Attention, Relevance, Confidence and Satisfaction, and forms the basis on which the motivation-enhancing strategies were applied in this study. Keller developed the ARCS model through the synthesis of behavioural, cognitive and affective learning theories.

Motivational theory as used by Keller (2001) is embedded in the blended learning theory, which assimilates distance learning experiences with e-learning experiences in adult education. This is done by using educational technology to impact adult learners' motivation to learn (Alonso, López, Manrique & Viñes 2005; Garisson & Kanuka 2004; Prinsloo 2007; Dahawy & Kamel 1991).

For the purpose of this study, blended learning is defined as 'the effective combination of different modes of delivery, models of teaching and styles of learning' (Procter 2003:3). Developing nations, such as South Africa, may require a blended form of distance learning that incorporates traditional distance education (paper based) and technology to meet the needs of all learners (Ferreira & Venter 2011). The challenge facing accounting educators in South Africa is to develop innovative tools to promote effective learning for distance learners.

VoP videos were designed to cover certain content in a distance education module by using Keller's ARCS model and blended learning theory. After administering the VoP videos to a sample of adult learners, two survey instruments were used to collect and analyse quantitative data to assess motivation: (1) The Course Interest Survey (CIS) designed by Keller and based on the ARCS model, which acted as a situational measure of learner motivation in relation to the course taught; and (2) The Instructional Motivational Material Survey (IMMS), also based on Keller's ARCS model, which was used as a situational measure of learner motivation in relation to the instructional material developed (external conditions) (Keller 2010).

The problem is that distance learners struggle with motivation to learn due, in part, to the transactional distance inherent in distance-based education. This lack of motivation has a negative impact on performance. Possible ways to address this problem is to increase motivation (which could cause an increase in performance) by developing instructional material based on motivational theory and decrease transactional distance by incorporating blended learning theory into the design of instructional material. For purposes of this study, we seek to answer the following research questions:

- Do Voice-over-PowerPoint™ (VoP) videos designed based on motivational and blended learning theory, impact the learner's perception of their overall motivation as measured by the Instructional Materials Motivation Survey (IMMS)?

- Is there an inter-correlation between the four motivational factors measured by the Instructional Materials Motivation Survey (IMMS) and Course Interest Survey (CIS)?
- Does gender, age, language or student group have an impact on the overall motivation measured by the IMMS?
- Is there a difference in the overall course motivation level, measured by the CIS, of the learners who watched the VoPs as opposed to those who did not?

The primary contribution of this study is to provide educators in distance learning environments with a practical guide to develop instructional material based on motivational and blended learning theory; to use as part of their course delivery, with a proven expectation that it would lead to an increase in student motivation and a decrease in transactional distance, which may lead to an increase in student performance. It contributes to the literature regarding motivational theory and blended learning theory in that it establishes that if these theories are applied in the development of instructional material, the theoretical benefits are also practically perceived by the students.

This paper begins with a literature review that lays the context to the need to implement motivational strategies embedded in blended learning, to enable effective learning, into an adult learning taxation curriculum. This is followed by details of the research design implemented to attend to the research questions as stated above and an analysis of the data obtained. The paper concludes with a summary of the findings and a discussion of limitations and recommendations for future research.

2. Literature Review

The literature review covers the historical massification of education, including adult lifelong learning, which has led to the growth of distance education and blended learning followed by the focus area of motivation, models of motivation in a learning context, continuing with the choice of the ARCS model and the selection of Voice-over-PowerPoint™ (VoP) videos as the e-learning tool in this study. The literature review concludes with a summary of the key themes discussed.

2.1. Adult Education in the 21st Century

The dawn of the technological era has changed education into a lifelong learning process, making adult education essential to tertiary education (Martin (as cited in Brown & Brown 1994). The massification (elite-mass transition) of education brought about rapid growth in distance education in response to the participation and flexibility needs of the learner population that was interested in lifelong learning (Manik 2015).

The ubiquitous use of technology in distributed learning environments (instructional delivery via a mix of multimedia methods) through the creation of a ‘virtual’ presence provides the flexibility and access to learning required by adult learners (Holzinger, Nischelwitzer & Meisenberger 2008). Active, learner-centred participation in the education process is required with adult learners as they are self-directed learners who learn best when participating and not just listening to lectures (Marcy 2001). The proliferation of educational technology has made education at a distance attractive for young and old alike.

The separation of educators and learners by space and/or time simplistically describes distance education and this form of education can be traced back as far as the mid-1800s. The demands of the open access ideology brought about evolutionary change in distance education rather than a revolution (Brown & Brown 1994). The underlying theory base of teaching and learning at a distance remains relatively unchanged since its inception. What has changed, however, is the medium through which it is delivered. Trow (1999) states, ‘The growing demand for lifelong learning is independent of the development of IT [Information Technology], which simply accelerates it’ (p. 307).

Educational technology provides a platform to catapult distance education, in its many forms (correspondence, online, e-learning, mobile-learning (m-learning), and blended learning), into the future as the educational leader, provided that the quality of instructional material and support systems are improved significantly to stay abreast of learner demands (Trow 1999). Understanding the effect of the delivery medium on learner motivation is an important consideration.

2.2. Motivation in Adult Learners

The importance of motivation as a factor in academic success is emphasised by a variety of authors (Pascarella & Terenzini 1991; Prinsloo & van Rooyen

2007; Keller 1999a; Briggs, as cited in L. Visser 1998). Research into motivation in distance-based education is an area that needs to be further explored (Moller, Huett, Holder, Young, Harvey & Godshalk 2005; L. Visser 1998). An attempt is made in this study to add to the body of research of motivation in distance-based education.

Motivation as a critical psychological concept in learning is well supported in the literature (Means, Jonassen & Dwyer 1997; Rodgers & Withrow-Thorton 2005; Song & Keller 2001; Keller 1979; Keller 1987a; Keller 1987b; Keller 1987c). Motivation is a multifaceted topic that extends to essentially all areas of psychology. No single theory is capable of explaining all that is known about motivational processes, and it is unlikely that such a theory will be realised in the near future. Constructs in the field of motivation have established many relationships, but no common ground has been established empirically or in theory (Graham & Weiner 1996).

A synthesis of various working definitions of the motivation to learn is applied in this study, namely; motivation to learn is the effort that a person will employ towards the accomplishment of a chosen goal for self-actualisation.

The continued debate amongst theorists as to whether motivation is intrinsic or extrinsic, or whether it falls within the effective or cognitive domain is useless, according to Song (1998), if it is not guiding instructional designers. Research indicates that learner motivation can be manipulated through external conditions provided that the instructional design, based on sound educational theory, incorporates motivational components in the instructional design of the condition (Keller 2010; L. Visser 1998; Gabrielle 2003; Huett 2006; Moller 1993).

This study deals with the impact of a well-designed e-learning tool, as an external condition, on the perceived motivation of adult learners in a distance-based learning environment.

2.3. Models of Motivation

Two models of motivation were considered for this study, the Time Continuum Model of Motivation (Wlodkowski 1999) and the ARCS Model of Motivational Design (Keller 1999a). Both models are based on motivational theory and provide a systematic approach to enable the logical sequencing of orientation, design, development, and evaluation (L. Visser 1998).

The Time Continuum Model of Motivation was considered inappropriate for distance-based learning due to the lack of flexibility relating to the timing of conditions addressed at specific phases of the learning process.

2.4. ARCS Model of Motivational Design

Keller's (1987c) synthesis of human motivational theories led to the categorisation of the four-factor ARCS Model of Motivational Design, comprising Attention (A), Relevance (R), Confidence (C) and Satisfaction (S). Keller created the ARCS model to make the theory and research in the field of motivation more easily applied in actual instruction. The model should be applied as a problem solving strategy to solve motivational aspects in any learning environment through the design of the instructional material, grounded in motivational theory. The ARCS model was developed in the late 1970s early 1980s and has been applied across a broad spectrum of learning environments, including blended learning. The ARCS model is a systematic approach to influence student motivation through the inclusion of motivational tactics in instructional material (Keller 1979; Keller 1999a).

The ARCS model was developed on the premise that motivation is the drive to achieve personal satisfaction with an expectancy or possibility of success. This systematic approach is supported by three assumptions. Firstly, people's motivation can be manipulated or influenced; secondly, motivation is a means to performance, not the end goal thereof; and thirdly, motivation can be predictably influenced by the implementation of a systematic design (Keller 1999a).

A synopsis of the four basic components is as follows.

2.4.1. Attention

The first category, attention or interest, refers to attentional factors (stimuli) in the environment and is a prerequisite for learning. Gaining a student's attention is relatively easy, however, it is decidedly more difficult to maintain, especially in distance-based education. By incorporating motivational design that includes attention enhancing tactics (for example, colour, graphics, animation, structure and planning) into the instructional material, the student's attention will be gained and sustained with the appropriate stimuli, which leads to better learning (Keller & Suzuki 2004).

2.4.2. Relevance

The instructional material must meet the needs and objectives of the learner by being aligned with the current course/module objectives. Relevance should answer the question ‘Why do I need to study this?’ (Keller 1987a:1). In this study, the answers may include ‘To prepare for the Tax Technicians Exam’ or ‘To assist in my work as a tax consultant’.

2.4.3. Confidence

The learners’ attitude towards (perception) the likelihood of being successful impacts their actual success. Attitude affects effort-based attributions, for example, if a student believes they are incapable of attaining success, they have practically negated any chance of succeeding.

2.4.4. Satisfaction

The final category relates to the positive feeling that a student experiences in relation to an accomplishment. Here the intrinsic and extrinsic motivation of a person influences their overall motivation.

Table 1 - Keller's ARCS Model Summary

Attention	Relevance	Confidence	Satisfaction
A1 Perceptual Arousal	R1 Goal orientation	C1 Learning Requirements	S1 Natural Consequences
A2 Inquiry Arousal	R2 Motive Matching	C2 Success Opportunities	S2 Positive Consequences
A3 Variability	R3 Familiarity	C3 Personal Control	S3 Equity

Keller (1987a; 1987b).

Each of these basic conditions originates from several areas of physiological research. The systematic approach of the ARCS model builds on

a motivation analysis, which analyses possible solutions systematically to locate and solve motivational problems. A full ten-step process of designing motivational instruction materials based on the ARCS principles has been successfully adapted to a simplified version to reduce the time required to understand and design the model for educators not trained in the use of the ARCS model of motivational design (L. Visser 1998; Keller & Suzuki 2004). This study applied the simplified version.

The ARCS model has multinational representation (Keller 1987; del Soldato & du Boulay, in Keller 1999b; Astleitner & Keller 1995; Suzuki & Keller in Keller 1999b; J. Visser & Keller 1990; L. Visser 1998) with proven validity and reliability within various learning environments (Means, Jonassen & Dwyer 1997; J. Visser & Keller 1990). The problem-solving design, coupled with the flexibility and adaptability (both important in a distance learning environment (L. Visser 1998)) of the systematic approach of the ARCS model of motivation were the considerations that led to the decision to use this model in this study.

The selection of the ARCS model of motivation was followed by the choice of Blended Learning as an underlying theory base.

2.5. Bridging Transactional Distance through Blended Learning

The motivational level of distance learners is inherently lower than traditional, on-site learners due, in part, to the sense of isolation and lack of social presence (Bolliger, Supanakorn & Boggs 2010; Lee & Chan 2007). This disconnectedness (Kanuka & Jugdev 2006) may negatively impact the motivation to learn (Inoue, in Bolliger, Supanakorn & Boggs. 2010), as well as academic success. Technology allows the ‘humanising’ of instructional materials (Lee, Tan & Goh 2004) and the opportunity to bridge the transactional distance through the creation of a transactional (virtual) presence (Beldarrain 2006). Transactional distance has been described as the cognitive and physiological space between the educator and the learner where possible misunderstandings between educator inputs and the learners’ comprehension may occur (Moore 1993). Initiatives aimed at reducing transactional distance, including blended and distributive learning strategies, claim to positively impact the motivation to learn and to increase learner success (Oliver & Trigwell, as cited in Prinsloo & Van Rooyen 2007; Van Oordt & Mulder 2016).

Motivation is essential in learning and academic success, especially where self-directed learning is required. Blended learning is an ideal method for leveraging the strengths of more than one andragogic methodology⁶.

This study is situated in the Blended Learning Theory as one of the theoretical constructs, along with Motivational Theory, which was needed to positively impact the motivation to learn. Ferreira and Venter (2011) suggest that developing nations such as South Africa should apply a blended form of distance-based learning that incorporates traditional distance education (paper based) and technology to meet the needs of all learners.

Procter's (2003) definition of blended learning was applied as it synthesised the key aspects of blended learning (e-learning/ IT, distance learning, models of teaching and learning, and learning styles) without being too broad. 'Blended learning is the effective combination of different modes of delivery, models of teaching and styles of learning' (Procter 2003:3).

Blended learning has been advocated as 'the best of both worlds,' provided that it is properly designed (Graham 2006). The possibilities are plentiful and the notion of a holistic learning environment should be exciting for any educator, provided the quality and design of such a system are safeguarded. This study sought to maximise the benefits of blended learning through the implementation of a well-designed tool using the advantages of the Blended Learning Theory to increase motivation and reduce transactional distance.

Following on from the choice of model and theory base was the decision relating to the delivery medium. Podcasting, in the form of VoP videos, was selected after matching the study objectives to the appropriate educational technology available. Bollinger *et al.* (2010) noted that podcasts may be particularly beneficial to students studying at a distance.

2.6. Podcasting (Voice-over-PowerPoint™)

Currently, podcasts are divided into three categories: audio-podcasts, enhanced podcasts, and video podcasts (Liu & McCombs, as cited in Bollinger *et al.* 2010). The Voice-over-PowerPoint™ (VoP) videos used in this study fall into

⁶ Andragogic methodology is the theory that differentiates the needs of adult learners from those of juveniles and uses the term andragogy to describe the specific methods that should be employed in the education of adults.

the enhanced podcast category, also referred to as screencasts. This encompasses a combination of audio and digital still images (further enhanced with on-screen animation). The advantage here is that enhanced podcast files are relatively small compared to vodcasts (video podcasts). In this study, the VoP videos consisted of screen recordings, using Microsoft® PowerPoint™ (Microsoft®, n.d.) for the slide design, and TechSmith's Camtasia Studio as the screen recording and video editing software.

This medium of delivery is supported in the literature, as 'screencasts can have a positive effect on student performance. Further analysis of student feedback shows that student confidence was increased by watching the screencasts' (Loch, Jordan, Lowe & Mestel 2013:256; Van Oordt & Mulder 2016).

Podcasting has four distinctive characteristics that make them appealing to learners (Donnelly & Berge 2006). Firstly, the power of the human voice and tone in communication is leveraged and personalises the subject matter more than written words alone. Lee *et al.* (2004) refers to this as humanising the instructional material with the objective of engaging students in active learning. Secondly, the learners are able to exercise greater control over their learning through being provided the option to read a textbook, listen to a podcast, or both. Thirdly, the possibility of multitasking becomes a reality for the student (i.e. they could exploit their commuting time by listening/viewing the podcast during this time). Fourthly and lastly, students' ability to learn asynchronously at a time and place that is convenient for them is very appealing. This study incorporated all four of the characteristics into the design and implementation of the VoP videos.

In this study, the integration of podcasts was intended to foster a sense of community and create a social presence, thereby reducing transactional distance. Suitably designed podcasts can promote the integration of educator-learner transactions in distance education by neutralising the negative effects of the physical separation between educator and learner (Lee & Chan 2007). The aspects detailed above provide the basis for and relevance of this study in determining the impact of well-designed instructional materials on adult learners' perceived motivational levels. This discussion was aided by the consideration of the history of higher education, distance, and blended education in particular, continuing with the importance of motivation, based on motivational constructs. This was followed by the motivational model selected, where after it concludes with a discussion of the selected educational technology to achieve the objectives of this study.

3. Methodology

Quantitative research was considered the most suitable research method to be applied in this empirical study, as it allows for testing the relationship between the external condition (the instructional material designed and delivered as an e-learning tool) and the learner's perceived level of motivation (Creswell 2014).

A case study design was followed in developing the instructional material e-learning tool embedded in motivational and blended learning theory. A module specific topic was selected and VoP videos were designed taking into account factors affecting motivation related to Attention, Relevance, Confidence and Satisfaction (ARCS). The VoP videos were made available to students on their learning management system. After being exposed to the VoP videos for some time, students were asked to complete two surveys:

- 1) All students registered in the course were asked to complete the CIS (Course Interest Survey);and
- 2) Only students who watched the VoP videos were asked to complete the IMMS survey (Instructional Motivational Material Survey).

A descriptive statistical design was applied to gain insight into the complex area of learner motivation. This was done without delving into the complex psychological factors of motivation. A one-shot case study with post-test results was deemed a suitable probing design as the results determine whether a more comprehensive study in this regard is warranted from a cost, time and benefit perspective.

3.1. Teaching Context

The identified population comprised a cohort of learners enrolled in the Graduate Programme on Principles and Practical Application of Taxation through continuing education at the University of Pretoria (CEatUP), South Africa. This course is offered for non-degree purposes and is the equivalent of a second year degree course (or subject) at a Level 6 on the National Qualifications Framework (NQF), which counts 40 credits and is a year-module. This course was offered as an open (Grade 12 admission requirements only), part-time course via either distance learning or contact with optional

face-to-face lectures offered over 21 Saturdays between February and November 2016 at the University of Pretoria's main campus.

The enrolments for this course in 2016 comprised 186 learners, consisting of males and females from various ethnic backgrounds. Within this cohort, approximately 142 learners formed part of a fully financed bursary programme funded by the Financial and Accounting Services Sector Education and Training (FASSET), and the Sector Education and Training Authority (SETA). FASSET's objective is skills development within the South African financial and accounting services sector. The learners who had FASSET bursaries were referred to as the Intela group, which means taxes in Zulu. The Intela learners were made up of only black South African residents, male and female, who were geographically located in either Pretoria or Polokwane (260 km from the University of Pretoria). The Intela Pretoria learners attended contact lectures, whereas the Intela Polokwane learners watched the DVDs of the lectures with a tutor present. The remaining 44 enrolled learners comprised self-funded male and female learners from various ethnic backgrounds, who are referred to as normal course users (either contact or distance learners).

The learners enrolled in this course comprised 40% male and 60% female learners between the ages of 22 and 65, with an average age of 32.

The course curriculum was designed to align with the 'Knowledge and Practical Skills' component of the South African Institute of Tax Professionals (SAIT) Tax Technician Qualification. The curriculum was based on the SAIT competencies for a Tax Technician in order to adequately prepare learners for the SAIT Tax Technician Knowledge Exam at the end of each year (in November). The learning outcomes of this course provide learners with a thorough understanding of the general principles of the tax system in South Africa, including the basic application thereof.

3.2. Sampling

The VoP videos designed were made available to the group described above as the researcher had access to this group and it met the requirements of adult learners in a distance education environment. The learners participating in the survey represent a nonprobability convenience sample. The researchers acknowledge that the results of the study may not be used to infer from the sample to the general population of all adult learners in distance education. However, it may be beneficial as a probing mechanism to understand the

phenomena of how well designed instructional material can have an impact on perceived motivational levels of adult distance education learners. Figure 1 in the data analysis section of this study provides more information about the respondents in the sample and how the researchers aimed to address non-response bias.

3.3. The Instruments

Two surveys were used to measure motivation: (1) The Course Interest Survey (CIS); and (2) The Instructional Materials Motivation Survey (IMMS), both developed by Keller and based on the ARCS model. The CIS is a situational measure of motivation associated to the curriculum being taught, whereas the IMMS is also a situational measure to identify motivation related to specific instructional materials (Keller 2010). Both surveys were applied in a web-based format using the Blackboard learning management system of the University. In an attempt to bolster the response rates, repeat reminder e-mails were sent to learners as web-based surveys are less likely to attain response rates at the same level as surveys administered face-to-face, or paper-based surveys (Nulty 2008).

The Course Interest Survey (CIS) used a Likert-type scale ranging from 1 to 5 with 34 items, where nine were reverse items (Keller 2010). In relation to the course, the survey was designed to assess the learners' overall motivation score, as well as their score in terms of the four ARCS sub-components (Attention, Relevance, Confidence and Satisfaction). The survey was amended, with permission from the instrument's author, by the researcher for better application to the research context. The full CIS survey is available in Appendix A.

The CIS was considered a valid instrument with previously documented reliability coefficients, as indicated by a Cronbach's Alpha of between .80 and .95 (Gabrielle 2003; Huett 2006; Keller 2010). A total reliability Alpha of .81 was obtained on the conversion of the CIS to a web-based format (Huett 2006).

The Instructional Materials Motivation Survey (IMMS) also used a Likert-type scale ranging from 1 to 5 with 36 items, where ten were reverse items. The survey was designed to assess the learners' overall motivation score and the score of the four sub-components of the ARCS model in relation to the instructional material. The IMMS was amended by the researcher, with

permission from the instrument's author, for better application to the research context. The full IMMS survey is available in Appendix A.

The IMMS' overall Cronbach's Alpha score obtained in prior studies ranged between .80 and .96 (Keller 2010; Moller 1993). The adaptation of the IMMS to a web-based format resulted in a total reliability Alpha of between .84 and .93 in other studies (Gabrielle 2003; Huett 2006).

3.4. Application of the ARCS Motivational Model in the Design of the VoP Videos

The ARCS model of motivation is easily adapted to the needs of a group. This is evident in that it has been implemented in many educational settings, proving the flexibility of the model.

This study applied the simplified version of Keller's model of motivational design to create motivational strategies for the target population (Keller 1999b; Keller & Suzuki 2004; L. Visser 1998); this was based on the ARCS model. The simplified version was selected to avoid the use of excessive strategies and to enable the replication of this study by novice educators, especially those unfamiliar with the full ARCS model (L. Visser, 1998; Song & Keller 2001).

The steps in the simplified motivational design are recognisable in the use of a matrix framework, which assisted the researcher to firstly identify the key motivational characteristics (motivational problem analysis) in (a) The learners; (b) The instructional material; and (c) The medium used (hardware or software). The next phase involved evaluating and selecting the prescribed motivational strategies based on the motivational problems that were identified (gap analysis) prior to the development of the motivational material. Finally, evaluating the motivational material was done as prescribed by most development models. The simplified version ensures that educators avoid the use of excessive strategies (as these negatively impact motivated learners) or the use of strategies based on the educator's own preference or area of interest (Keller 1999b; Keller & Suzuki 2004; L. Visser 1998).

In this study, the resulting design methodology used to identify motivational problems and evaluate motivational strategies is represented in a matrix (refer to Table 2).

The course feedback survey (administered by the course co-ordinator), and discussions with the course co-ordinator provided the basis for the

audience analysis. This assisted in the process of obtaining general information about the learners' attitude towards the course, which is dealt with in the first row of Table 2. The learners were, on average, in their 30s, indicating that they experienced multiple demands on their time and attention from various sources (i.e. work, family and friends), resulting in inherently lower levels of attention towards their studies. Most of the learners indicated that they elected to enrol in this course to further their education or careers, with many of them obtaining bursaries, which created a strong link for them to the personal relevance of this course. Confidence is generally low in distance education, and learners lack expertise. This course is linked to a professional qualification, making it highly applicable in the achievement of the learners' goals. Furthermore, the instruction in this course is provided by multiple educators, increasing the variety of teaching styles to better address all of the learners' learning styles. This could therefore result in a positive level of satisfaction.

The second row of the simplified design shows the appeal of the course, or the learners' attitudes in relation to the specific course content. The learners' initial levels of attention tend to wane as the novelty of studying a new course wears off. Relevance increases as the applicability of what is learnt is applied, however, the difficulty of the concepts causes a loss of confidence. The lack of interaction and the probability of not staying up-to-date with the curriculum impact the learners' levels of satisfaction negatively.

The third row presents the learners' attitude towards the medium of delivery of the course instructional material. The novelty of using the various course materials attracts the learners' attention initially. Over time, however, this effect tends to wear off due to the limited media used (text, lecture recordings on DVD, and for some, the lectures themselves) and the lack of variety in learning strategies, which impacts learner satisfaction as well. Confidence fades as the application of theoretical concepts changes from simple to complex.

The fourth row evaluates the identified motivational problems from Step 1, and identifies the motivational tactics to address these problems. In this study, the researcher's analysis of the learners, the instructional material, and the medium used determined that the problem areas lay in attention and confidence.

The fifth row defines the motivational objectives and the selection of motivational tactics. Extensive motivational strategies were required for attention and confidence, with only limited tactics used to improve relevance

and satisfaction in order to maintain motivation rather than to solve a specific problem. An extensive list of the tactics selected to deal with attention and confidence follows in the upcoming paragraphs. A selection of tactics was made considering Keller's strategies (Keller 1987a) for obtaining and maintaining attention, relevance, confidence and satisfaction (details of these strategies are set out in Appendix C). Tactics based on the researcher's experience were also included.

Table 2 - Simplified Motivational Design Matrix based on the ARCS Model

	Attention	Relevance	Confidence	Satisfaction
Learner characteristics	Adult (on average 30 years of age), part-time learners with multiple demands on their time (-).	Elective course for career growth (+). Most students were sponsored, therefore creating direct responsibility for someone else (+).	Most lacked technical expertise in tax, therefore low skills (-).	Multiple instructors, likely to experience varied teaching/ learning styles (+). Highly applicable skill, leads to the Tax Technician qualification (+).
Appeal of learning task (to learner)/ attitude towards learning task	Initially, high may wear off as course continues over the course of a year (-).	Relevance improves as learners apply what they have learnt (+).	Concepts may seem difficult to apply (-).	Disappointment may set in due to demands on time (staying up-to-date with the course challenging), feelings of isolation due to limited interaction (-).

Learners' attitude towards medium: course material on learnermanagement system (Click-Up)	Initially high as novelty effect, but tends to wear off due to a lack of variation in content and learning approaches (-).	Fairly familiar, not first time Learner Management System (LMS) is used (+). Limited access to data or internet (-).	Unstable network (access to internet/data) may cause learners to be concerned (-).	Limited direct feedback other than test results (-).
Attitude towards course material	Initially high, tends to decrease due to duration of the course (year-module) (-).	Useful in future (linked to goals) (+).	Confidence fades where the application of basic theory becomes complex (-).	Little participation for distance and possibly Intel Polokwane learners too (-). Low due to a lack of personal contact (-).
Summary	Attention tends to diminish over time.	Relevance continues throughout the course, although its significance may decrease slightly over time.	Confidence is influenced by results, but is generally low as this may be a first time experience in formal tax education.	Satisfaction is not generally a major problem, especially if the other areas are addressed.
Suggested motivational tactics	Necessary to capture and maintain attention.	Minimal tactics needed.	Necessary to build confidence.	Minimal tactics needed.

L. Visser (1998); Keller & Suzuki (2004). *Note: (-) depicts negative and (+) depicts positive implications of the analysed factor in terms of the relevant sub-components of the ARCS model*

Tool selection: The selection of enhanced podcasts considered tools that were simple enough to be used by educators with limited technological proficiency, limited time, and with little to no budget. The development entailed slides generated in Microsoft® PowerPoint™, where after TechSmith's Camtasia Studio was used as the editable screen recording software to produce the Voice-over-PowerPoint™ (VoP) videos.

Tool format: The VoP videos were made available in an MP4 format to ensure the highest level of compatibility with as many devices as possible in order to increase learner access. The VoP videos were made available for download and/or viewing through the learner management system of the institution, ClickUp (Blackboard Learn™).

It should be noted that the DVDs of the contact lectures (on average 3.5 hours in length) were made available to the learners at an additional cost to the learners themselves, however, these DVDs do not form part of this study.

Timing of implementation: The VoP videos were designed to be complementary, supplementary tools for revision (Vogele & Gard 2006). They were made available to the learners a few days after the content was covered in a contact lecture, and almost two weeks before a formative assessment was written.

Content: Through consultation with colleagues, and the researcher's own experience, topics were selected based on their relevance within the curriculum, as well as the level of difficulty that the students experienced with the application of these topics. By nature, taxation is continually changing, therefore, the researcher's focus was on the application of general principles rather than specific rules or exceptions in order to ensure that it would be used again within the taxation curriculum.

The following section provides a descriptive analysis of the data obtained from the learner sample, used to determine the learners' level of motivation following the use of the VoP videos. The quantitative data was analysed using SPSS.

4. Data Analysis

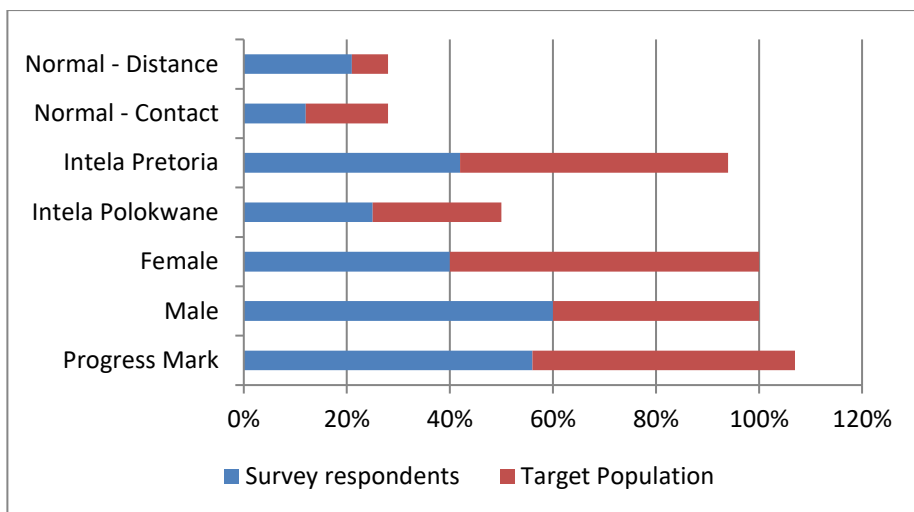
The data was analysed using Figure 1 and Tables 3 – 6, these tables contain the following information:

- Figure 1: An analysis of the respondents as compared to the target population demographics. Used to address the risk of non-response bias.
- Table 3: Analyses Research Question 1 – Do Voice-over-PowerPoint™ (VoP) videos designed based on motivational and blended learning theory, impact the learner’s perception of their overall motivation as measured by the Instructional Materials Motivation Survey (IMMS)?
- Table 4: Evaluates Research Question 2 – Is there an inter-correlation between the four motivational factors measured by the Instructional Materials Motivation Survey (IMMS) and Course Interest Survey (CIS)?
- Table 5: Assesses Research Question 3 – Does gender, age, language or student group have an impact on the overall motivation measured by the IMMS?
- Table 6: Examines Research Question 4 – Is there a difference in the overall course motivation level, measured by the CIS, of the learners who watched the VoP videos as opposed to those who did not?

Sixty-six learners (35%) of the 186 enrolled learners commenced the survey. Due to missing data, nine cases were deleted from the data set, resulting in a response rate of 31% from 57 respondents (35 of whom completed both the IMMS and CIS as they had used the VoP videos, whereas the 22 who did not use the VoP videos completed only the CIS).

Acceptable response rates of 30% for online surveys have been supported by Kelley, Clark, Brown & Sitzia (2003) and the University of Texas at the Austin Faculty Innovation Center (Austin Faculty Innovation Center 2010). The researchers recognise that the results of this study may not be used to make broad assumptions of the entire population, due to inherent non-response bias risk. In an effort to attend to the non-response bias, Table 3 explains the demographics of the total sample of learners compared to that of the respondents.

Figure 1 - Respondents as compared to the target sample



An analyses of the respondents as compared to the target sample was undertaken (refer to Figure 1). The progress mark (grade) of the respondents and the non-respondents was compared as a proxy for learner engagement in order to quell the supposition that only engaged learners would voluntarily complete a survey. The average progress mark for the respondents was 55%, as compared to the 51% of the target sample. This showed a small variance, indicating that the level of learner engagement across respondents and the target sample was relatively similar. The respondents and target sample results for student group and age (see the section on demographics above) resulted in similar dispositions. Gender revealed the only distortion, showing an almost exact inversion where 60% of the target sample comprised females, however, 60% of the respondents were male.

Table 3 determines the overall motivational level of the learners who watched the VoP videos, in response to Research Question 1. The average score for all items in the IMMS was calculated, resulting in a mean scores of the respondents ranged from 2 to 5 ($M = 4.09$). These results indicate that the use of VoP videos positively impacted the users' perceived overall motivation.

Table 3 lists the mean scores and standard deviation for the four sub-components of the ARCS model.

Table 3 - Descriptive statistics for all sub-components

Scales for IMMS	Mean	Standard Deviation
Overall Motivation	4.09	-
Attention	4.08	0.59
Relevance	4.08	0.45
Confidence	4.10	0.67
Satisfaction	4.09	0.63

In Table 3 the mean scores of the four sub-components yielded scores exceeding 4.0, with Attention ($M = 4.08$) and Relevance ($M = 4.08$) marginally lower than Confidence ($M = 4.10$) and Satisfaction ($M = 4.09$).

The results for Research Question 1 indicate that the use of VoP videos by adult learners positively impacted their overall level of motivation, with encouraging results in each sub-component as well.

Table 4 evaluates the inter-correlation coefficients between the four sub-components measured by the IMMS and CIS, in response to Research Question 2. The CIS were completed by all respondents, and the IMMS only by those respondents who also watched the VoP videos. The inter-correlation coefficients were determined because we compare the overall motivation level of students who watched the VoP videos with the overall motivation levels of students who did not watch the VoP videos in research question 4. The results showed that all correlations were statistically significant at the 0.01 level. For the IMMS instrument, the Attention/Confidence sub-components resulted in the highest correlation ($r = 0.83$), with Relevance/Confidence showing the lowest correlation ($r = 0.69$). The correlation coefficients generated by the CIS sub-components were generally lower than those in the IMMS. The Satisfaction/Relevance sub-components resulted in the highest correlation ($r = 0.62$), and Relevance/Confidence showed the lowest correlation ($r = 0.45$). This is consistent with the results of the IMMS correlation coefficients for these sub-components.

Table 4 - Inter-correlations between the four sub-components (IMMS and CIS)

Sub-components	Attention		Relevance		Confidence		Satisfaction	
	IMMS	CIS	IMMS	CIS	IMMS	CIS	IMMS	CIS
Attention	-	-	-	-	-	-	-	-
Relevance	0.73**	0.57**	-	-	-	-	-	-
Confidence	0.83**	0.51**	0.69**	0.45*	-	-	-	-
Satisfaction	0.78**	0.59**	0.79**	0.62*	0.78**	0.57**	-	-

** Correlation is significant at the 0.01 level (2-tailed).

Prior research indicates statistically significant relationships between the four sub-components measured by the IMMS and CIS (Bollinger *et al.* 2010; Keller 2010), as does the current study in the results of Research Question 2.

Table 5 assesses the statistical impact of particular demographic factors on the motivation of learners who used the VoP videos. The reason for the inclusion of these tests is to establish whether the motivation levels of students with particular characteristics are more or less impacted by the use of well-designed instructional materials. To achieve this objective, a Pearson’s Chi-Squares test (χ^2) was conducted between the various sub-components and gender, age, language, and student group to determine whether any differences were statistically significant.

Table 5 - Demographic factors impact on motivation

Demographic factor	Chi-Squares (χ^2)	<i>p</i>
Gender	31.81	0.32
Age	60.95	0.37
Language	30.06	0.45
Student group	89.36	0.49

Gender - More male learners (weighted) showed motivational levels of four or more as compared to their female counterparts. However, the

difference in motivation levels of male and female respondents proved to not be statistically significant ($\chi^2 = 31.81$, $p = 0.32$).

Age - The learners responses were split into three age brackets (20 – 29, 30 – 39, and 40+) based on their responses to Item 2. Learners in the 20 – 29 and 40+ age brackets were more motivated (weighted) by the use of the VoPs with 100% of learners' motivational levels at 4 or 5. Learners in the age range of 30 – 39 showed a slightly lower motivational impact with 86.7%, scoring motivational levels of 4 or 5. Although differences in motivational levels exist, they prove non-statistically significant as indicated by the results of the Pearson's Chi-Squares test on age ($\chi^2 = 60.95$, $p = 0.37$).

Language - The respondents were divided into two groups (first language English and second language English). This was done by categorising those that responded in English to item 5 as first language English speakers, and all other responses being classified as second language English. The results indicated no statistically significant association between first or second language English on the motivational impact of the VoP videos ($\chi^2 = 30.06$, $p = 0.46$).

Student group - The learners were divided into four groups according to their responses to Item 7 (Intela Polokwane, Intela Pretoria, Normal course user – contact and Normal course user - distance). Although close to 100% of the learners scored motivational levels of 4 or 5, the Normal course user – Distance had the lowest (level 4 or 5 scores when weighted) of only 90%. No statistically significant difference in the learners' overall motivation was indicated by the Pearson's Chi-Squares test between the four groups ($\chi^2 = 89.36$, $p = 0.49$).

In **summary**, for Research Question 3, although differing motivational levels existed within the demographic factors (gender, age, language and student group), none showed any statistically significant differences. It can therefore be concluded that the well-designed instructional material used in this study did not have more or less of an impact on students with specific characteristics, but had an equal impact on all students.

Table 6 examines whether any statistically significant difference in the learners' motivational level existed between the learners who watched the VoP videos and those who did not. The two variables were not normally distributed, and the two distributions had different shapes. Therefore, a Mann-Whitney U test was conducted to compare the mean rank.

The respondents were separated into two groups (watched VoP and did not watch VoP) based on their responses to Item 8 and Item 9 in the

questionnaire. The results of a Mann-Whitney U test indicated that the group that watched the VoP videos had the highest mean rank. The higher course motivation level of the learners that watched the VoP videos was statistically significant ($U = 233, p = 0.02$), as compared to the learners who did not watch the VoP videos. These results may indicate that users associated the use of the VoP videos with the course content, and were therefore more motivated than those who chose not to use them. In their respective studies, Huett (2006) and Gabrielle (2003) both found that their treatment group results, as measured by the CIS, showed increased levels of motivation as compared to the control group.

Table 6 - Difference in motivational levels of learners who watched the VOP videos

Components	Mean Rank	Mann-Whitney U test
Watched the VoP video(s)	33.03	$U = 233, p = 0.02$
Did not watch the VoP video(s)	22.10	
Attention: Watched the VoP video(s)	32.61	$U = 248, p = 0.031$
Attention: Did not watch the VoP video(s)	22.81	
Satisfaction: Watched the VoP video(s)	34.01	$U = 197.5, p = 0.003$
Satisfaction: Did not watch the VoP video(s)	20.40	

Interestingly, when the U-test was calculated for the four sub-components of the ARCS model, Satisfaction produced the most statistically significant difference between the two groups ($p = 0.003$), with Attention a close second ($p = 0.03$).

4.1. Summary of Findings

For the first research question, the quantitative outcomes indicated that there was a positive impact on learner motivation with mean scores of 4.09 for overall motivation, as measured by the IMMS. Furthermore, the mean scores of all four sub-components (Attention, Relevance, Confidence and Satisfaction) of the ARCS model scored 4.08 or higher.

For Research Question 2, the inter-correlation between the four sub-components of the IMMS and CIS were calculated with all correlations, indicating a strong linear relationship. This was indicated by a correlation coefficient in excess of 0.510, except the Relevance/Confidence relationship in the CIS instrument, which had a lower correlation coefficient ($r = 0.45$). The Attention/Confidence sub-components for the IMMS and the Satisfaction/Relevance sub-components for the CIS resulted in the highest correlation ($r = 0.83$ and $r = 0.62$ respectively). For both instruments, the Relevance/Confidence relationship resulted in the lowest correlation ($r = 0.69$ for IMMS and $r = 0.45$ for CIS).

A test for any association between the demographics and the sub-components was investigated through Research Question 3, where the difference in overall motivation was tested for statistical significance. The results indicated no statistically significant difference in motivational levels for these factors (gender, age, language and student group).

Lastly, to explore Research Question 4 the results of the Mann-Whitney U tests indicated statistically significant differences in overall motivation, satisfaction and attention regarding the course for learners who watched the VoP videos when compared to those who did not.

5. Conclusion

Educators in distance education, including taxation in the accounting field, are confronted with challenges to attend to the learning needs of adult learners, of which motivation is but one fundamental factor in academic success (Strage 1999; Pascarella & Terenzini 1991).

In order to address the challenges, educators should ensure that the process of instructional design is embedded in sound andragogic learning theories. Blended Learning Theory is advocated as a means to addressing the flexible learning needs of adult learners (Garrison & Kanuka 2004; Graham, Woodfield & Harrison 2013; Van Oordt & Mulder 2016) as well as a tool to bridge the transactional distance. Motivational theory is a critical psychological concept in learning and academic success (Means *et al.* 1997; Rodgers & Withrow-Thorton 2005; Song & Keller 2001; Keller 1979; Keller 1987a; Keller 1987b; Keller 1987c; Pascarella & Terenzini 1991; Prinsloo & van Rooyen 2007; Keller 1999a; Briggs, as cited in L. Visser 1998). Previous literature proves that motivational levels can be impacted by external

conditions such as well-designed instructional material (Keller 2010; L. Visser 1998; Gabrielle 2003; Huett 2006; Moller 1993).

This study describes the implementation of a blended e-learning tool, designed to impact learner motivation, based on motivational theory, and aims at determining, quantitatively, whether the use of such tool impacts a learners' motivational level. The four component ARCS model (Attention, Relevance, Confidence and Satisfaction) of motivational design was used to design the instructional material (VoP videos) and the impact thereof was measured using the IMMS (Instructional Motivational Material Survey) and CIS (Course Interest Survey).

It appears that the majority of learners were motivated by the use of the VoP videos at an overall motivational level as well as showing strong results in the targeted sub-components of attention and confidence. The four sub-components of the ARCS model showed strong correlations in both the IMMS and CIS instruments. None of the tested demographic factors (age, gender, language and student group) had any statistical impact on the overall motivational level of the learners. Finally, the motivational level of learners who used the VoP videos was statistically significantly higher than those who did not use the e-learning tool.

The most important outcome of this study was the finding that the use of external conditions, in the form of VoP videos, clearly impacted overall motivation positively. These findings further confirm the ARCS model as an effective tool designed to increase overall learner motivation. It also validates its effectiveness in adult learning and distance education (Keller 1979; Keller 1987a; Keller 1987; Means *et al.* 1997; Song & Keller 2001).

Nevertheless, the validity of the independent components of the ARCS model fell beyond the scope of this study.

Furthermore, the introduction of new digital multimedia in a curriculum appears to be an effective delivery medium for motivationally enhanced tactics in adult learning. This study did not validate any assertions regarding the validity of the ARCS components that are supported by prior literature (Keller 1987; Naime-Diefenbach 1991). This study provided educators in distance learning environments with proof that if instructional material, which is well-designed based on motivational and blended learning theory, is incorporated into course content then it will cause increased student motivation with an associated decrease in transactional distance. Prior research has established that an increase in motivation and a decrease in transactional

distance leads to an increase in student performance (Prinsloo & van Rooyen 2007; Keller 1987). Educators can therefore use well-designed instructional material with confidence to meet the needs of students and institutions.

The researchers recognise the various limitations to the study, due to the narrow scope of the study. Many alternative learning and motivational theories exist that may also address the educators challenges in the taxation and accounting field. An exploration into all these theories lay beyond the scope of this study. The study was conducted over a short time period therefore increasing the duration of a future study with multiple survey intervals could indicate statistically significant differences in the motivational impact thereof over time, considering that levels of motivation vary. An assortment of e-learning tools, suitable for a blended learning approach, exist that could be included into a curriculum and further studies could be conducted to determine the best delivery medium to improve learner motivation, for instance, delivery via a live streaming webinar that allows learners to interact with the educator in real time. True experimental or quasi-experimental research design could be followed to strictly isolate the effect of external conditions (designed to impact motivation) on learner motivation by controlling for elements that impact motivation. This approach would be a valuable contribution to the body of literature. There is still a lot that could be done to explore motivation of adult learners in distance education ((Moller, Huett, Holder, Young, Harvey & Godshalk 2005; L. Visser 1998). This study is a step towards practically suggesting ways in which educators can use well-designed instructional material to have an impact on motivation of adult learners in distance education.

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