

# **THE PERCEIVED MOTIVATIONAL IMPACT OF VOICE-OVER-POWERPOINT™ ON PART-TIME ADULT LEARNERS' IN A DISTANCE LEARNING ENVIRONMENT**

by

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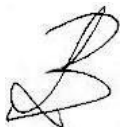
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Lorena Brits

Irene (South Africa), December 2016

## ABSTRACT

# THE PERCEIVED MOTIVATIONAL IMPACT OF VOICE-OVER- POWERPOINT™ ON PART-TIME ADULT LEARNERS' IN A DISTANCE LEARNING ENVIRONMENT

by

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The primary purpose of this study was to determine whether external conditions, in the form of an e-learning tool, impact the learning motivation of adult learners in a distance education environment. This study also tested the use of Voice-over-PowerPoint™ technology as a suitable medium to deliver motivational instruction 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 (VoP videos), and further supports the ARCS model. Furthermore, the use of VoP videos as a viable medium for delivering motivational strategies in a distance learning environment was validated.

Keywords:

Distance education

Adult learning

Blended learning

Motivation

ARCS Model

Accounting education

Taxation education

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## DEFINITION OF KEY TERMS

**Table 1: Definition of key terms used in this study**

Key term	Definition
Distance Learning	The permutations associated with distance learning are vast. Therefore, distance learning, for the purposes of this study, refers to the method of education where learners can study in their own time, place, and where face-to-face contact with the educator is voluntary.
Motivation	In this study, motivation is referred to in the context of education or learning and it implies a student's disposition, desire, need or compulsion to take part in, and be successful in, the learning process (Bomia, Beluzo, Demeester, Elander, Johnson & Sheldon, 1997).
Educator	Academic staff employed at post-secondary education institutions such as universities.
Learner	Learners were classified, for the purposes of this study, as distance learners as the tool implemented was "web-based only".
Andragogy	Methods or techniques used to teach adults.

## LIST OF ABBREVIATIONS AND ACRONYMS

**Table 2: List of abbreviations and acronyms used in this study**

Abbreviation	Meaning
ARCS	Attention, Relevance, Confidence and Satisfaction
CIS	Course Interest Survey
DHET	Department of Higher Education and Training
EVT	Expectancy Value Theory
FASSET	Financial and Accounting Services Sector Education and Training
HEIs	Higher Education Institutions
ICT	Information, Communications and Technology
IT	Information Technology
IMMS	Instructional Materials Motivational Survey
SAIT	South African Institute of Tax Professionals
SDG	Sustainable Development Goals
SETA	Sector Education and Training Authority
VoP	Voice-over-PowerPoint™

## CHAPTER 1

### INTRODUCTION

#### 1.1 BACKGROUND

The fourth goal of the United Nations' (UN) 2030 Agenda for Sustainable Development seeks to ensure that education on a universal scale becomes both equitable and inclusive. In order to achieve this goal, the UN will focus on improving access to higher education, as well as enhancing the use of Information, Communication and Technology (ICT), with a focus on the least developed nations (United Nations 2030 Agenda, 2015).

These sustainable development goals in education are by no means recent additions to the global agenda. With such a long-standing universal mandate, open learning has been an ideology adopted by many Higher Education Institutions (HEIs) over the past two decades as it brings equality and access to learning for society as a whole. Open learning is predominantly a didactic policy through which barriers to learning are removed, such as removing admission requirements to study (Bates, 2005). With the aim of reaching more learners, distance education has been driven as a 'new' andragogic tool at many traditional HEIs (Ideal Project - Study 1, 2014). The introduction of educational technology, along with the massification of higher education (mainly for profit reasons) has brought about growth in distance education enrolment world-wide. In the United States (US), just over a quarter (28%) of learners take at least one distance education course amounting to a staggering 5.8 million distance learners (Babson Report Card, 2016). Europe's enrolment numbers in distance education are slightly more difficult to quantify, however, more than two million learners are registered at distance HEI's (Ideal Project - Study 1, 2014). In South Africa, the learners enrolled for distance education institutions exceed one-third (more than 300 000) of the learner population (South African Department of Higher Education and Training, 2014).

With the massification of education, the focus has shifted from educator-centred to learner-centred learning, requiring learners to be self-directed and motivated (Lee, 2000). The post-

industrial era of distance education is characterised by the flexibility (personalisation) and joint control of the learning process, which requires collaborative and adaptive learning theories (Garrison, 2000). There is no one-size-fits-all methodology as the line between traditional (face-to-face) learning; e-learning, which includes m-learning (learning via mobile phone); and distance learning blurs with the increasing popularity of including educational technology into the curriculum design and andragogy of HEIs. For the purposes of this study, distance education is defined as education where learners can study in their own time, place, and where face-to-face contact with the educator is voluntary.

Distance learners differ substantially from one another, and profiling the average distance learner is for all intents and purposes pointless as it fails to show the diversity that exists in the learner population (Speth, in L Visser, 1998). 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 factors) (Subotzky & Prinsloo, 2011).

Student motivation and academic preparedness in terms of higher education are two fundamental factors in academic success (Strage, 1999; Pascarella & Terenzini, 1991). This emphasises the importance of motivation in distance education as a research area that needs to be explored (Moller, Huett, Holder, Young, Harvey & Godshalk, 2005; L Visser, 1998; Bolliger, Supanakorn & Boggs, 2010; Huett, 2006; Gabrielle, 2003). This Voice-over-PowerPoint™ (VoP) video study was designed to impact the motivation of part-time adult learners who are studying in an open, distance learning environment.

Motivation is seen as one of the critical psychological concepts in academic success, which is supported by empirical evidence (Means, Jonassen & Dwyer, 1997; Rodgers & Withrow-Thorton, 2005; Song & Keller, 2001; Keller, 1979; Keller, 1987a; Keller, 1987b; Keller, 1987c; Huett, 2006; Gabrielle, 2003; L Visser, 1998). Distance learners' level of motivation differs from that of traditional learners in higher education (Qureshi, Morton & Antosz, 2002) in part due to feelings of isolation (Inoue, in Bollinger, Supanakorn & Boggs, 2010) and the transactional distance experienced by the learner (Bolliger *et al.*, 2010). Transactional

distance has been described as more than just the physical space between the learner and educator, but also a psychological and communication space that comprises many possible misunderstandings between the educator and the learners (Moore, 1993). Minimising transactional distance, feelings of isolation and disconnectedness will positively impact learners' motivation, and consequently their chance of academic success. Research indicates that learner motivation can be impacted by external conditions (Moller, 1993; Huett, 2006; Gabrielle, 2003; L Visser, 1998; Song & Keller, 2001). This study thus aimed to impact the motivation of adult learners through the use of a well-designed and engaging e-learning tool. 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 (Lee, Tan & Goh, 2004).

The instructional methods undertaken in this study are well supported in the literature. Bollinger *et al.* (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 were motivated by the use thereof. Keller developed the ARCS model of motivation to trigger and control 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. The ARCS model is discussed in further detail in Chapter 2.

The theory on which this study was based, Motivational Theory, is embedded in the Blended Learning Theory regarding adult education, which assimilates distance learning experiences with e-learning experiences. This is done 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.

The purpose of this study was to use Voice-over-PowerPoint™ (VoP) videos (a motivationally-enhanced e-learning tool), which was designed based on the four factors of the ARCS model, in order to positively impact learner motivation in an adult education environment as part of a blended learning approach. The intent was to use the VoP videos to connect with the learners (thus decreasing transactional distance), and to reinforce certain motivational tactics through the design of the e-learning tool, as suggested by Keller (1987a). Keller's (1987a) suggested motivational strategies are set out in Appendix C.

The motivational impact was measured through the administration of two surveys, developed by Keller, to be completed by a group of adult learners: (1) The Course Interest Survey, and (2) The Instructional Materials Motivation Survey (Keller, 2010).

## **1.2 PROBLEM STATEMENT**

Motivation is crucial to learning, especially in distance education where learners must be active and self-directed participants in their learning (Lee, 2000). Distance education has its own challenges for educators who wish to motivate and connect with their learners. Some authors have suggested that it may, in part, be due to the transactional distance that is inherent in the distance learning environment (Galusha, 1998; Moore, 1991). Prior research indicates a silence in the literature concerning the motivational needs of distance learners (Subotzky & Prinsloo, 2011; Gabrielle, 2003; Means, Jonassen & Dwyer, 1997; L Visser & Keller, 1990), especially part-time adult learners. The question is whether the implementation of VoP videos has an impact on the perceived motivation of learners.

## **1.3 PURPOSE STATEMENT**

The primary purpose of this study was to investigate whether the introduction of external conditions, in the form of motivationally-enhanced VoP videos based on the ARCS model of motivational design, impact motivation in adult learners. This study was based on the Motivational Theory, which is embedded in the Blended Learning Theory for adult learners.

## 1.4 RESEARCH OBJECTIVE AND QUESTIONS

The research objectives of this study were to answer the following research questions in ascertaining the impact of motivation on adult, distance education learners. The research questions were as follows:

1. Do Voice-over-PowerPoint™ (VoPs) videos impact the learner's perception of their overall motivation as measured by the Instructional Materials Motivation Survey (IMMS)?
2. Is there an inter-correlation between the four motivational factors measured by the Instructional Materials Motivation Survey (IMMS) and Course Interest Survey (CIS)?
3. Does gender, age, language or student group have an impact on the overall motivation measured by the IMMS?
4. 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?

## 1.5 IMPORTANCE AND BENEFITS OF THE PROPOSED STUDY

Prior literature has identified motivation as an important factor in student success, especially in the distance learning environment where motivation is generally lower than for on-campus students (Huett, 2006; Gabrielle, 2003; L Visser, 1998; Suzuki & Keller, 2004; Song & Keller, 2001; Bolliger *et al.*, 2010)

The primary contribution of this study is the optimised learning experience of the learner, which may even spill over to impact their performance, although the latter is beyond the scope of this study. This study is furthermore significant as positively motivated learners may enable improved student retention and success.

This study will benefit the educators responsible for distance and adult learning curricula reforms through instructional design in accounting education, diplomas, short courses and law professional degrees.

This study may also contribute to the limited body of research on motivation in distance learning environments in developing countries.

## 1.6 LIMITATIONS OF THE STUDY

Learner motivation, by nature, fluctuates. The ARCS model of motivational design is thus designed to motivate a reasonably typical learner, one who is co-operative and interested in learning. The model applied in this study is not designed to modify behaviour of learners who may be indifferent, bored or even antagonistic.

## 1.7 ASSUMPTIONS

An assumption of the ARCS model of motivational design is that the group as a whole will be responsive to the motivational strategies implemented.

This model is more heuristic rather than prescriptive, and the intervention is refined with a degree of trial and error.

## 1.8 OPERATIONAL DEFINITIONS

**Distance learning:** This refers to the method of education where the learner is separated from the educator in both time and space. Face-to-face contact with the educator is voluntary, and learners are able to study at any time and place.

**Motivation:** For the purposes of this study, motivation is contextualised in terms of motivation to learn, and it implies a student's disposition, desire, need or compulsion to take part in, and be successful in the learning process (Bomia, Beluzo, Demeester, Elander, Johnson & Sheldon, 1997). Motivation in the course content will be measured by the Course Interest Survey (CIS), and motivation in the VoP videos will be measured using the Instructional Materials Motivation Survey (IMMS) (Keller, 2010).



**Blended Learning:** This comprises “the effective combination of different modes of delivery, models of teaching and styles of learning” (Procter, 2003:3). In the context of this study, this is the combination of distance learning education and educational technology (such as an e-learning tool).

**Self-directed learning:** An individual’s desire to learn over and above the required course content (L Visser, 1998).

**Educator:** Academic staff employed at a post-secondary education institution, such as a university.

**Learner:** This study relates to adult learners in a distance learning environment, unless specifically stated otherwise, as the e-learning tool was implemented on the “web only”.

## 1.9 RESEARCH METHODOLOGY

In order to attain the primary objectives of this study, a quantitative research methodology embedded in the Blended Learning Theory and Motivational Theory was applied. The ARCS model of motivational design was used to develop a motivationally-enhanced e-learning tool (VoP videos). This tool was used to educate part-time adult undergraduate taxation (for non-degree purposes) learners (186 enrolled learners) at a South African university. The e-learning tool was incorporated as a complementary supplementary tool. Two survey instruments were used in this study 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 instructional material (external conditions) (Keller, 2010). A detailed discussion of the instruments used in this study is set out in Chapter 3.

## 1.10 STRUCTURE OF THE MINI-DISSERTATION

The structure of the mini-dissertation is summarised and described below.

## **Chapter 1: Introduction**

This chapter set the background of the study and provided an introduction to the mini-dissertation. The research context, including the problem statement, followed by the purpose statement and the research objectives, was presented in this chapter. The significance and benefits of the study were qualified, and limitations to the study and the operational definitions used during the study were also explained.

## **Chapter 2: Literature review**

This chapter lays out the concepts on which this study was based. The topic is developed through a review of the relevant sources. This literature review explores the concept of instructional design in distance education for enhanced motivation. This chapter further provides the conceptual constructs of the theoretical framework, which were developed in the study to evaluate the motivational impact of an e-learning tool (designed for enhanced motivation) on adult learners in South Africa.

## **Chapter 3: Research design and methods**

This chapter provides a detailed outline of the design and research methods applied in the current study. It describes the quantitative research design used, the data collection methods, a description of the data analysis procedures, as well as the process of ensuring the quality and credibility of the data.

## **Chapter 4: Data analysis**

This chapter explores the data analysis methods, as described in Chapter 3, which were applied to the data collected from the learners.

## **Chapter 5: Conclusion**

This chapter concludes the study by demonstrating how the outcomes originally expressed in Chapter 1 were addressed. A summary of findings, an interpretation of the research questions, as well as the implications of the findings are then presented. The limitations of the study and recommendations for future research precede the concluding remarks.

## CHAPTER 2

### LITERATURE REVIEW

#### 2.1 INTRODUCTION

This chapter explores the literature in this field of study, which was used not only to ground this study, but to determine its possible relevance to the body of research. The focus of the discussion covers the historical massification of education, including adult lifelong learning, which has led to the growth of distance education and blended learning. The chapter continues with an analysis of motivational theories and models of motivation in a learning context, followed by the choice of the ARCS model and the selection of Voice-over-PowerPoint™ (VoP) videos as the e-learning tool in this study. In concluding, the chapter summarises the key themes discussed.

##### 2.1.1 The massification of higher education

Higher education has transformed in numerous ways post-World War II as a result of the expansion of access to tertiary learning. The driving forces that lead to the expansion from elite to mass universities lies broadly outside the control of Higher Education Institutions (HEIs), as is evidenced by the widespread demand and the call to open access to tertiary education even further (United Nations 2030 Agenda, 2015). Elite universities (up to 15% of the relevant age group) have grown into mass universities (16 to 40% of the relevant age group), which will expand into ‘uber’ universities with the continued drive towards even broader universal access (40% or more of the relevant age group) (Trow, 1999).

Martin (in Brown & Brown, 1994) explains that education was regarded as a cycle that ended when working life began. The dawn of the technological era has changed education into a lifelong learning process, making adult education essential to tertiary education. 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.

### **2.1.2 Lifelong learning/Adult learning**

The use of educational technology has created new lifelong learning opportunities for adults, supporting both formal and informal learning. 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 *et al.*, 2008). These multimedia methods include e-learning, m-learning (using mobile smart phones), blogs, wiki's, webinars and any other widely available application. 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). Historically, distance education was the professed educational choice of adult learners (characterised as older learners with family and/or work responsibilities), however, the proliferation of educational technology has made education at a distance attractive for young and old alike.

### **2.1.3 Distance education**

The separation of educators and learners by space and/or time simplistically describes distance education. Correspondence education can be traced as far back as the mid-1800s. Since then, the increased demand for distance education was bolstered by the industrial revolution and the momentous improvements in the delivery systems, from postal services, to radio, to television, to the internet, amongst others, with combinations of these systems still in use today (L Visser, 1998).

Distance education's rapid development came as a reaction to the access problems experienced in traditional education, given the increasing demand for learner-centred education. The open access philosophy has brought about an evolution 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 (1999:307) states, "The growing demand for lifelong learning is independent of the development of IT [Information Technology], which simply accelerates it."

The advancements in educational technology comprise emancipating education from the constraints of time and space, and vastly expanding the opportunities and choices for lifelong learning. Developments in Information Technology (IT) bring about both possibilities and problems in higher education. Educational technology has and is still blurring the lines between traditional and distance education to the point that these systems will be practically unrecognisable in the future (Trow, 1999). In distributive learning, instructional delivery occurs through a mixture of web-based multimedia tools. This may be the future for education as a whole as it provides the appropriate infrastructure and access to support it, provided the quality of the instructional material is ensured.

The open learning ideology has seen universal emphasis, with the access to higher education of developing nations being one of the uppermost goals of the UN 2030 Agenda for Sustainable Development (United Nations 2015). The advances in IT support this goal as the world becomes interconnected through the application of technology in education. 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 education and support systems are improved significantly to stay abreast of learner demands (Trow, 1999).

Distance-based learners are inherently less motivated than traditional learners due to the sense of isolation and lack of social presence (Bolliger *et al.*, 2010; Lee & Chan, 2007). The lack of social interaction, and feelings of isolation and disconnectedness (Kanuka & Jugdev, 2006) may negatively impact the motivation to learn (Inoue, in Bollinger *et al.*, 2010), as well as academic success. Technology allows the humanising and personalisation of instructional materials (Lee *et al.*, 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). Greater interactive capability (telephone, e-mail, forums, podcasts, webinars) available to a learner to communicate with educators and fellow learners reduces the 'distance' that exists in the pedagogic or andragogic transaction between the educator and learner (Prinsloo & van Rooyen, 2007). 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, in Prinsloo & van Rooyen, 2007).

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 methodology.

#### **2.1.4 Blended learning**

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.

The term blended learning in the literature has no single definition, some of which are too broad to be of any use. For the purpose of this study, Procter's (2003) definition was applied as it is comprehensive without being too broad in application. He synthesised the key aspects of blended learning, (e-learning/IT, distance learning, models of teaching and learning, and learning styles) to create his own working definition. "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). This study sought to maximise the benefits of blended learning using established theoretical constructs to ensure that the design of the educational technology used was appropriate to achieve the study objectives.

The developments in technology significantly impact on the possibilities for learning at a distance and the derivatives thereof. The proliferation of digital learning technology has increased the integration of computer-mediated learning into both traditional and distance learning environments (Graham, 2006). The increasing demand for lifelong learning is not a result of developments in IT, but rather a result of the importance and value of a well-

educated citizenry and workforce, where rapid technological change simply accelerates this demand (Trow, 1999).

Teaching and learning theories yield no one-size-fits-all approach to education, although blended learning does tick a lot more of the proverbial boxes than traditional or distance education have been able to in their historical sense. 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. A well-designed tool using the advantages of the Blended Learning Theory could thus reduce transactional distance and increase motivation.

### **2.1.5 Motivation**

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, in L Visser, 1998). Research into motivation in distance-based education is an area that needs to be further explored (Moller *et al.*, 2005; L Visser, 1998).

Motivation as a critical psychological concept in learning is well supported in the literature (Means *et al.*, 1997; Rodgers & Withrow-Thorton, 2005; Song & Keller, 2001; Keller, 1979; Keller, 1987a; Keller, 1987b; Keller, 1987c). By nature, the motivational levels of traditional university learners are higher than distance and online learning students due to, in part, the feelings of isolation and the distance (in space and time) between the learner and educator (Qureshi *et al.*, 2002; Kanuka & Jugdev, 2006). 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 an e-learning tool, as an external condition, on the motivation of learners in a distance-based learning environment.



The main theories of motivation of Graham and Weiner (1996) will briefly be addressed, followed by two motivational models, including the ARCS model of motivational design, which was used extensively in this study.

- ***Theories of Motivation***

Motivation has been positioned in the extrinsic domain as the effect of environmental conditioning (Skinner, 1953), or in the intrinsic domain as a product of internal drive and free will (Maslow, 1987).

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. He advocates the need for a practical definition of motivation to learn to incorporate the commonalities in the various psychological perspectives of motivation in order to provide a comprehensive understanding of the concept (Song, 1998).

Motivation is a complex psychological concept that has undergone multiple iterations over the years. In this regard, there are several relevant theories, which are detailed below.

#### *Mechanistic theories*

*The Drive Theory* was based on the principle that motivation was a result of a need or state of deficiency, ignoring the impact of human cognition (Hull, in Graham & Weiner, 1996). This led to *The Field Theory*, which applies a more cognitive notion of behaviour compared to the tension reducing drive of Hull's theory (Lewin, in Graham & Weiner, 1996). These theories lack suitable, clear and measurable observations of events as they were largely tested on animals.

## *Cognitive Theories*

The *Expectancy-Value Theory* (EVT) replaces *The Drive Theory* with expectancy as a determinant of motivation. In this theory, the behaviour undertaken is dependent on the likelihood that it will lead to success and the value of the goal in relation to other 'distractions' (Vroom, in Keller, 2008).

The *Theory of Achievement Motivation* bases all actions undertaken on the premise of self-understanding and self-realisation, where a person's personal motivation is related to their drive to achieve or to avoid failure (Atkinson, 1957).

The *Social Learning Theory* is based on a combination of the *Cognitive Theory* and *Affective Theory* (Bandura, 1977). All actions undertaken are determined by the expectancy of reward and the value attached to that reward (Tolman's purposive behaviourism), when a number of alternatives exist (Rotter's Influential Theory). The principle of locus of control was introduced, comprising the belief that the action taken would or would not affect the achievement of the outcome (Graham & Weiner, 1996). Locus of control is not expectancy, but rather a factor of expectancy (Weiner, in Graham & Weiner, 1996).

The *Attribution Theory* is based on a combination of Tolman, Rotter and Atkinson's theories, and ascribes its success and failure to internal or external causes, especially in the field of achievement. Where a person attributes success or lack of success to their own effort or ability, or a combination of the two, they would be classified as internally orientated, whereas a person who credits lack of success to conditions beyond their control (something is too difficult or bad luck), and success to good luck or something being too easy is classified as externally orientated (Heider, in Graham & Weiner, 1996)

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).

### *The definition of motivation in the context of learning*

The motivation to learn has been defined by many sources. The Encyclopaedia Britannica (2016) defines motivation as, “Forces acting either on or within a person to initiate behaviour,” Huett (2006) defines it as “the impetus to learn and to achieve one’s goals” (p. 16), while Moller (2005) defines it as “the length and direction of effort expended by the learner in pursuit of achievement” (p. 139). Keller (1983), alternatively defines it as “the choices people make as to what experiences or goals they will approach or avoid and the degree of effort they will exert in that respect” (p.389) (Keller, in Huett, 2006). In other words, motivation is the effort that a person will employ towards the accomplishment of a chosen goal for self-actualisation.

#### **2.1.6 Models of motivation**

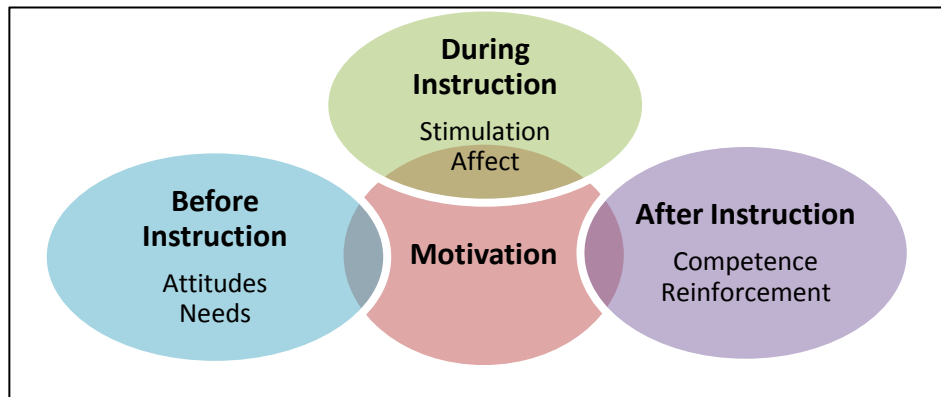
The two models of motivation that will be discussed, the *Time Continuum Model of Motivation* (Wlodkowski, 1999) and the *ARCS Model of Motivational Design* (Keller, 1999a), are based on one or more motivational theory. Both these models provide a systematic approach to enable the logical sequencing of orientation, design, development, and evaluation (L Visser, 1998).

- ***The Time Continuum Model of Motivation***

Wlodkowski’s (1999) model focuses on adult learners, analysing and dividing their motivational needs into different components, as did Keller (1979, 1999). Wlodkowski’s model identifies six motivational factors that influence learning in three different phases in the time continuum, in a fixed sequence using six basic questions. The primary motivational needs are identified on the time continuum before, during, and after instruction. The six questions lead to problem solving by applying the six factor analysis. The first step, which occurs before instruction, involves assessing the required tactics to establish positive attitudes and how to best meet the needs of the learners. This is followed by assessing the tactics for continual stimulation and for creating an experience for the learners as part of the second step (during instruction). Finally, in Step 3 (after instruction), the competence of the

learner and what reinforcement is necessary is determined. See Figure 1 below for a diagrammatic representation of the Time Continuum Model.

**Figure 1: The Time Continuum Model of Motivation**



Source: (L Visser, 1998)

This model includes problem solving, however its prescriptive conditions for the timing of the factors to be addressed at specific phases of the learning process make it an inappropriate model for distance-based learners.

- ***The 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). The ARCS model is a systematic approach to impacting student motivation through the inclusion of motivational tactics in instructional material (Keller, 1979; Keller, 1999a).

In the process of developing the ARCS model, Keller explored two important questions, the first being, can constructs of human motivation be synthesised into a simple, meaningful method that would be suitable to use in practice? The second question was, is the development of a methodical, rather than intuitive, approach possible in designing motivating instruction? (Keller, 1987c).

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).

Keller's starting point in the late 70s comprised the synthesis of the main theories of human motivation. The original model yielded four components (interest, relevance, expectancy and outcomes) that later transitioned to Attention, Relevance, Confidence and Satisfaction with the renaming of the four categories to strengthen the central feature of each category (Keller, 1987a).

A synopsis of the four basic components is as follows.

- *Attention*

The first category, attention or interest, refers to attentional factors (stimuli) in the environment and is a prerequisite for learning. This factor was derived from the Expectancy Value Theory (EVT) of motivation where the presupposition is that people pursue activities that they value and in which they expect to succeed (Keller, 1987a). Gaining a student's attention is relatively easy, however, it is decidedly more difficult to maintain. 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 lists the three sub-components of Attention (see Table 3): (A1) Perceptual arousal (capturing their interest); (A2) Inquiry arousal (stimulating their curiosity); and (A3) Variability (reinforces the first two sub-components by maintaining attention) (Keller & Suzuki, 2004).

- *Relevance*

The instructional material must meet the needs and objectives of the learner by being aligned with the current course/module objectives. Like attention, relevance stems from the EVT of motivation. According to Keller (1987a), it 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”.

Relevance also has three sub-components (see Table 3): (R1) Goal orientation (relating to current and future goals); (R2) Motive matching (match instructional needs and learning styles); and (R3) Familiarity (related to beliefs and prior experience or interests) (Keller & Suzuki, 2004). Relevance is the most important aspect in realising motivation and performance (Means *et al.*, 1997).

- *Confidence*

The learners’ attitude towards (perception) the likelihood of being successful impacts their actual success. The confidence sub-component was derived from the Social Learning Theory and the Attribution Theory. 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.

Keller lists three sub-components for confidence (see Table 3): (C1) Learning requirements (knowing what is expected improves student confidence); (C2) Success opportunities (adequate challenges to avoid boredom); and (C3) Personal control (control and feedback to reinforce personal effort).

- *Satisfaction*

The final category relates to the positive feeling that a student experiences in relation to an accomplishment. Satisfaction is needed to maintain motivation and is a derivative of EVT, where the intrinsic and extrinsic motivation of a person influences their overall motivation.

Keller lists three sub-components for satisfaction (see Table 3): (S1) Natural consequences (an authentic learning environment increases intrinsic motivation); (S2) Positive consequences (rewards and positive reinforcement, including verbal praise); and (S3) Equity (a fair and consistent standard applied to all students).

**Table 3: 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

Source: (Keller, 1987a, 1987b)

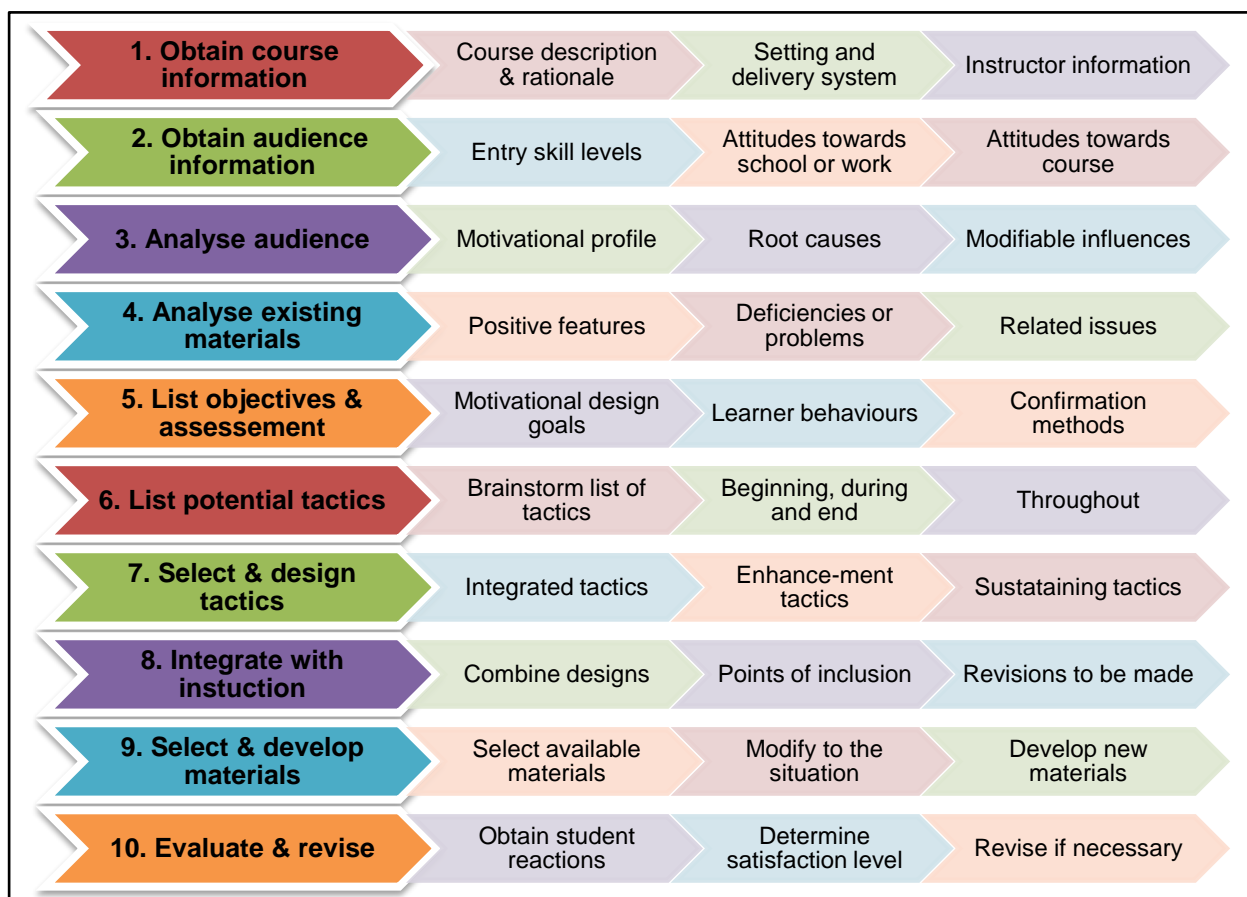
Each of these basic conditions originates from several areas of physiological research, which have been discussed briefly in the Motivational Theory sub-section of this chapter.

There are three methods of designing motivational material that have been advocated for, which can be applied in isolation or in combination. The first is a feature approach that captures the attention of the learners, the so-called novelty effect. The second is the principle seeking approach, which includes strategies to enhance the motivational appeal of learning, such as gamification. The third and final approach is the model established approach, where practical models are created for screen design and frameworks for motivational multimedia (Song & Keller, 2001). This study applied the first and third approach by incorporating the novelty of an online resource and the use of multimedia in the design of the VoP videos.

In terms of the possibility of developing a useful systematic approach to designing motivational instructions, the ARCS model builds on a motivation analysis, which analyses possible solutions systematically to locate and solve motivational problems. This model has evolved since its inception to a fully-fledged, ten phased (see Figure 2), systematic process of designing motivational instruction materials based on the ARCS principles (Keller, 1979; Keller, 1987a; Keller, 1987b; Song & Keller, 2001; Keller & Suzuki, 2004; Keller, 2010). The first four phases comprise an overall analysis of the course, audience and instructional

materials, which in turn provide the basis for a gap analysis. The fifth phase lists the design goals, based on the gap analysis, and specifies the manner in which they will be addressed. The following two phases, six and seven, requires devising a list of possible tactics shadowed by the decision of the final tactics to be implemented. This encompasses the critical analysis process of selecting the most appropriate tactics while considering constraining factors, such as, time, resources, skills and any other relevant factor. The final three steps require development and evaluation, which is similar to most development models (Keller, 2000; Keller, 1999b; Suzuki & Keller, 2004).

**Figure 2: ARCS Motivational Design Process.**



Source: (Keller & Suzuki, 2004)

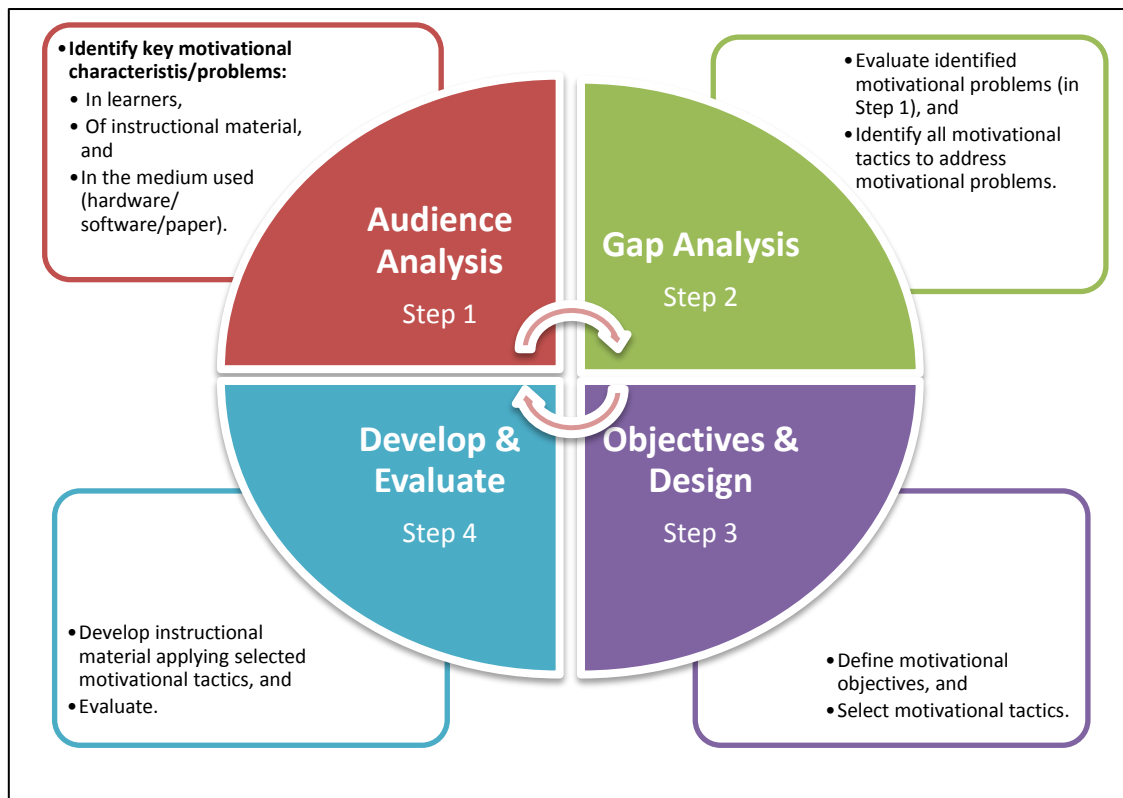
The inclusion of motivational strategies in each of the sub-components is recommended to enhance the motivation of learners. There is additional focus on components that have been identified as problematic (See Appendix C for a list of the prescribed motivational strategies (Keller, 1987a)). The motivational strategies should be evaluated based on the following criteria: (a) It must not take up too much instructional time, (b) It must not detract from the



instructional objectives, (c) It must fall within the time and money constraints of the development and implementation aspects of the instruction, (d) It must be acceptable to the audience, and (e) It must be compatible with the delivery system, including the lecturer’s personal style and preferences (Keller, 1987a).

The full ten-step model is time-consuming and may be confusing to educators not trained in the use of the ARCS model of motivational design. This has resulted in the application of a simplified version of the motivational design process in the field of self-directed learning (L Visser, 1998; Keller & Suzuki, 2004). A graphical representation of the simplified four step design process is depicted in Figure 3.

**Figure 3: Steps in the simplified motivational design based on the ARCS model.**



Source: (L Visser, 1998)

The simplified approach may be used in a matrix framework to assist in identifying key motivational characteristics in learners, instructional material, and in the medium used (hardware or software) in Step 1. This should be followed by an evaluation of motivational problems and the identification of the prescribed motivational tactics to address these problems; this is found in Step 2. Subsequently, Step 3 requires the definition of the

motivational goals in the design of the final chosen motivational tactics. Finally, Step 4 comprises the development and evaluation of the chosen motivational materials. The simplified version ensures that educators avoid the use of excessive strategies or the use of strategies that are based solely on the educators' own preference or area of interest (Keller, 1999b; Song & Keller, 2001; L Visser, 1998).

The educators in Lya Visser's (1998) study and the researcher in this study were able to use the matrix accurately to produce effective motivational designs, thereby confirming the effectiveness of the simplified version. The evaluation also found that the analysis phase was the most challenging in the process. The resulting design process for this study is explained in detail in Chapter 3.

### *Choice of the ARCS Model*

The ARCS Model provides a flexible yet systematic problem-solving process to address the motivational needs identified through the audience and course analysis. The four factors are not linked to a particular phase in the learning process as with the *Time Continuum Model of Motivation*. This is especially important in distance-based education as it may be important to maintain attention and address confidence throughout the process (L Visser, 1998).

The validity and reliability of the ARCS model is widely supported in the literature within various learning environments (Means *et al.*, 1997; J Visser & Keller, 1990). ARCS literature exists, for example, in distance, online, and web-based learning (Bolliger *et al.*, 2010; L Visser, 1998), in blended learning (Gabrielle, 2003) with significantly more literature in the traditional learning environment (face-to-face), and computer assisted instruction (CAI) (Song & Keller, 2001).

The model has multinational representation as it has been applied in the United States (Keller, 1987), the United Kingdom (del Soldato & du Boulay, in Keller, 1999b), Australia (Astleitner & Keller, 1995), Japan (Suzuki & Keller, in Keller, 1999b), Africa (J Visser & Keller, 1990), and Europe (L Visser, 1998).

The problem-solving design, coupled with the flexibility and adaptability 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 the medium of delivery. 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.

### **2.1.7 Podcasting / (Voice-over-PowerPoint™ videos)**

Currently, podcasts are divided into three categories: audio-podcasts, enhanced podcasts, and video podcasts (Liu & McCombs, in Bollinger *et al.*, 2010). The Voice-over-PowerPoint™ (VoP) videos used in this study fall into the enhanced podcast category, also referred to as screencasts. This encompass 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).

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.

Podcasts have been implemented in traditional courses by recording the lecturer or through the provision of supplementary or substituted instructional material (Copley, 2007). The platform for delivery ranges from using the Learner Management System (LMS) or podcast-hosting sites, such as YouTube. The VoP videos used in this study were supplied as supplementary material that was complimentary to the existing course material, with added visual triggers explaining the content in order to focus the attention of the user (McCombs & Liu, in Loch & Mcloughlin, 2011).

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).

This study is similar to that of Bollinger *et al.* (2010). Bollinger *et al.* (2010) used podcasts (audio only) for students in 14 online courses at a university in the United States, where 191 students completed an adapted IMMS questionnaire. The major differences between Bollinger *et al.*'s (2010) study and this study are three-fold: firstly, enhanced podcasts, VoP videos, were used containing audio-visual components; secondly, the implementation of the VoP videos and data were sourced from a blended learning environment (distance and face-to-face learners); and thirdly, the study took place at a South African university.

## 2.2 CONCLUSION

The aspects detailed in this chapter provide the basis for and relevance of this study in determining the impact of e-learning tools on adult learners' 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 the chapter was concluded with a discussion of the selected educational technology to achieve the objectives of this study.

## CHAPTER 3

### RESEARCH METHODOLOGY

#### 3.1 INTRODUCTION

The purpose of this chapter is to describe the design, methods, and process of data collection applied in this study. The specific research design is explained with a focus on the sampling process, data gathering procedures, the measurement instruments used, and a description of the validity and reliability of the study. The chapter substantiates the use of quantitative research to analyse the motivational impact of e-learning tools on adult learners in South Africa. The chapter ends with the limitations of this research, as well as the ethical considerations relating to this study.

#### 3.2 ORIENTATION TO THE RESEARCH METHODOLOGY AND DESIGN

The importance of motivation in distance education was established in the literature in Chapter 2. From the gaps in the literature, Moore (1991) specifically identified the need for a theory of motivation for distance education learners. The influence of educational technology may facilitate the merging of different theoretical frameworks to benefit learners (Beldarrain, 2006). The medium and viability of implementing motivational material within the South African and adult learning context is an important factor to consider.

This study aimed to investigate whether motivation can be affected by the implementation of an e-learning tool with motivationally enhanced features built into it. This concept was grounded in the Blended Learning Theory, and designed based on the ARCS model of motivation. The intervention and data collection period in this study spanned approximately two months from mid-July to mid-September 2016.

The data was gathered via the administration of two web-based surveys, namely, the CIS and the IMMS. These surveys primarily consisted of quantitative questions, with limited qualitative questions included for the refinement of possible future VoP tools.

### 3.3 RESEARCH APPROACH

The following paragraphs describe the different research methods used to obtain the most valid and reliable data for this study.

#### 3.3.1 Research methods

Research methods may be broadly categorised as qualitative, quantitative or mixed methods (Creswell, 2014). For the purposes of this study, Creswell's (2013: 4) definitions are applied, which are as follows:

- Qualitative research is “an approach for exploring and understanding the meaning individuals or groups ascribe to a social or human problem.”
- Quantitative research is “an approach for testing objective theories by examining the relationship among variables.”
- Mixed methods research is “an approach to inquiry involving collecting both quantitative and qualitative data, integrating the two forms of data, and using distinct designs that may involve philosophical assumptions and theoretical frameworks.”

Multi-method research refers to research where more than one research method is utilised without crossing the line between quantitative and qualitative research. Mixed methods research is categorised under the broader classification of multi-method research, which means that, for example, numerical data is combined with coded field observations in order to better understand a phenomenon (Vogt, Gardner & Haeffele, 2012).

In exploring adult learners' level of motivation with the use of an e-learning tool in a distance based learning environment, a quantitative approach was best suited to achieve the objectives of the study.

### 3.3.2 Research design

- ***Descriptive statistical design***

Virtually every quantitative analysis contains descriptive statistics to describe the simple characteristics of the data in a study. Descriptive statistics provide summaries or simple graphics of the analysed data (i.e. frequencies, means, maximums, minimums, and standard deviation) in order to create a 'picture' of the population and the distribution thereof.

- ***Case study design***

The case study research method is defined by Thomas (2011:513) as the “analyses of persons, events, decisions, periods, projects, policies, institutions, or other systems that are studied holistically by one or more methods.”

- ***One-shot, post-test non-experiment***

In this method, “a single group is exposed to a treatment or event and a dependent variable is subsequently observed (measured) in order to assess the effect of the treatment” (Fraenkel & Wallen, 2009:265). This design does not have a comparison group (thus it is one-shot). The post-test only allows for the gaining of valuable information regarding the phenomenon to be studied, as well as the justification thereof for further comprehensive research. A limitation of this design is in establishing, with any certainty, the effect of other factors on the phenomenon.

- ***Cross-sectional***

Cross-sectional, survey-based research is characterised by asking questions of a sample of the population at a specific point in time in order to explain an aspect of the population or society (Fraenkel & Wallen, 2009)



The most appropriate research design for this study was deemed to be a descriptive, one-shot post-test case study. Questionnaires were used to evaluate the learners' level of motivation after the use of supplementary (revision) e-learning tools. A descriptive statistical method was then applied to investigate learner motivation. Learner observations and two cross-sectional questionnaires were used as the data collection methods.

A descriptive statistical design was applied to gain insight into the complex area of learner motivation, whereas the case study design allowed for the refinement of factors affecting motivation related to Attention, Relevance, Confidence and Satisfaction (ARCS). 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.

This quantitative research method was applied to the 34 items in the CIS and 36 items in the IMMS with a 5-point *Likert-type* scale that measured learner motivation. The limited open-ended items in the survey were used to refine possible future e-learning tools.

### **3.3.3 Data collection**

- ***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.

- ***Sampling***

A non-randomised sample, with no limitations in terms of ethnic group, was drawn from the population (as described above) as it was not viable to statistically randomise the sample.

The learners participating in the survey represent a convenience sample, as the surveys were administered by the Taxation Department at the University of Pretoria, and it was

therefore convenient to use those learners enrolled in the Graduate Programme in the Principles and Practical Application of Taxation to complete the surveys.

- ***The data collection 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 instructional materials. Both surveys were applied in a web-based format. 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 PROCEDURES AND MATERIALS**

#### **3.4.1 Application of the ARCS motivational model in this VoP study**

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, as depicted in Figure 3, 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). The simplified version of Keller's motivational design model was discussed in detail in the Literature Review in Chapter 2.

In this study, the resulting design methodology used to identify motivational problems and evaluate motivational strategies is represented in a matrix (refer to Table 4 below).

**Table 4: Simplified Motivational Design Matrix based on the ARCS Model**

	<b>Attention</b>	<b>Relevance</b>	<b>Confidence</b>	<b>Satisfaction</b>
<b>Learner characteristics</b>	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 (+).
<b>Appeal of learning task (to learner)/ attitude towards learning task</b>	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 (-).
<b>Learners' attitude towards medium: course material on learner management system (Click-Up)</b>	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 (-).
<b>Attitude towards course material</b>	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 Intelta Polokwane learners too (-). Low due to a lack of personal contact (-).
<b>Summary</b>	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.
<b>Suggested motivational tactics</b>	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.*

The course feedback survey (administered by the course co-ordinator), and discussions with the course co-ordinator provided the basis for the audience analysis (Step 1, Figure 3). 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 4. 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 (also part of Step 1, Figure 3). 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 final factor in Step 1, Figure 3). 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 (Figure 3), and identifies the motivational tactics to address these problems (Step 2 in Figure 3). 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 (Step 3 in Figure 3). 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 (Step 4 in Figure 3). 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.

- ***Attention strategies***

Taking cognisance of the analysis of motivational problems, extensive strategies were selected (Keller, 1987a) for inclusion in the motivational tool to obtain and sustain attention.

(a) Incongruity or conflict was used to introduce a fact that seemed contradictory to the learners' experience;

(b) Concreteness was introduced through the inclusion of visual representations, examples, and anecdotes;

(c) Variability was introduced in terms of the lecturer's tone of voice, the use of tables, visuals, different fonts, as well as a variable presentation style (fast, slow, humorous);

(d) The VoP videos incorporated humorous anecdotes, introductions or analogies while introducing, explaining or summarising content;

(e) Inquiry was promoted through the use of problem-solving activities, such as examples;

(f) The duration of the e-learning tool was determined, ideally lasting between three and ten minutes (van Oordt & Mulder, 2016); and

(g) The e-learning tool incorporated audio and visuals, as well as structuring the content in order to cater to the different learning styles.

- ***Relevance strategies***

Minimal strategies addressing relevance were selected with the aim of maintaining motivation rather than solving a relevance problem. These strategies were limited to:

- (a) Linking the content to the learners' existing skills or experience;
- (b) The present intrinsic value of the content in comparison to the future goals of the learners; and
- (c) Modelling enthusiasm for the content specifically and taxation as a discipline in general.

- ***Confidence strategies***

Extensive tactics were selected to address the problem of confidence, as identified in the analysis, which included:

- (a) Clearly stating the appealing learning goals and self-evaluation tools in order to meet the learning requirements objective;
- (b) Organising the content and its application in the form of examples in order to progressively increase the difficulty of the course;
- (c) Emphasising learners' expectations that effort is linked to success, as well as providing a framework for the application of principles where relevant;
- (d) Covering the attribution strategy; and
- (e) Building self-confidence through the revision of content (theory) and through the incorporation of examples with increasing levels of difficulty.

- ***Satisfaction strategies***

The strategies selected were limited as satisfaction was not identified as a problem area, but rather a result of the successful functioning of the other components (attention, relevance and confidence). The satisfaction strategies included:

- (a) Encouraging learners to apply their skills in the formative test, as well as in practice; and



(b) Giving verbal praise and reinforcement at the end of each section or example.

### **3.4.2 The selection of the e-learning tool or medium of delivery**

The selected e-learning tool (enhanced podcasts) entailed the development of slides 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. The researcher sought to develop tools that were simple enough to be recreated by educators with limited technological proficiency, limited time, and with little to no budget. These factors were considered by the researcher to have an impact on the sustainability and possibility of replicating the project in the future. It was posited that the ease of development would impact the implementation of the tool by other educators across various subjects or courses. Educational technology has evolved and grown exponentially over the past decade, leaving an ocean of educational tools in its wake. Numerous software programs (or applications) were investigated by the researcher, and it is acknowledged that various applications are available in the market to create a similar e-learning tool. The specific applications were selected as other applications were found to be too complex to master in the given time, too time consuming to develop, or too expensive to implement with no funding available for the intervention. The applications selected are capable of incorporating all the needed strategies and are suitable for use by both contact and distance learners. In an attempt to increase learner access to the e-learning tool, the VoP videos were made available in an MP4 format to ensure the highest level of compatibility with as many devices as possible. 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 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. The learners prepared for the contact lectures by reading the prescribed textbook and completing a pre-test. The contact lectures focused on covering content theory and the application thereof. The VoP videos were designed with a focus on practical application, with limited theory, due to the assumption that learners prepared for the contact lectures and pre-test, or to stay up-to-date with the course curriculum in the case of distance education learners.

- ***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 researcher intended the design and implementation of VoP videos as an e-learning tool to impact motivation, which forms the second iteration of such a process. The first iteration was implemented at the largest open distance learning university in Africa on post-graduate learners where the data collected is still in the process of being analysed.

### **3.5 DATA ANALYSIS**

The quantitative data obtained through the use of the Likert scale surveys (CIS and IMMS) were analysed using SPSS version 24.0 for Windows.

Subsequent to the data collection phase, the internal reliability of the instruments was calculated using Cronbach's Alpha. The CIS and IMMS instruments produced reliability coefficients of .92 and .93 respectively. Cronbach's Alpha is a measure of the internal consistency of the items in the scale where values above 0.8 are considered as good, and above 0.9 as excellent (George & Mallery, in Gliem & Gliem, 2003).

The reliability estimates of the CIS for each category were acceptable at: (a) Attention ( $\alpha = .93$ ), (b) Relevance ( $\alpha = .93$ ), (c) Confidence ( $\alpha = .92$ ), and (d) Satisfaction ( $\alpha = .92$ ).

The reliability estimates of the IMMS for each category were acceptable at: (a) Attention ( $\alpha = .94$ ), (b) Relevance ( $\alpha = .96$ ), (c) Confidence ( $\alpha = .95$ ), and (d) Satisfaction ( $\alpha = .95$ ).

Descriptive statistics were calculated after the nine negative items of the CIS and the ten negative items of the IMMS were recoded by reversing the Likert-scale responses, 5 now being *Strongly Disagree*. A series of chi-square tests were performed to assess the statistical significance, if any, of gender, age, language, and student group on motivation among students. The results of these tests are further discussed in the data analysis in Chapter 4.

### **3.6 SOURCES OF BIAS OR ERROR THAT MAY HAVE INFLUENCED THE RESEARCH FINDINGS**

The bias of the researcher may become apparent during the design of the questionnaire or when interpreting the results. This could occur at a subconscious level through the reflection on the researcher's ideals and opinions. The bias relating to the questionnaire's design was largely controlled by the fact that the questionnaires had been used in many studies world-wide by experienced academics.

Bias at participant level can occur if the participants give the answers that they assume the researcher is anticipating. Moreover, errors may occur if participants misinterpret or misread the questions, resulting in incorrect responses (Saunders, Lewis & Thornhill, 2010:364–365). The research objectives were detailed in the covering letter of the questionnaires in order to decrease any potential bias in this regard.

An inherent level of non-response bias exists with any survey; the impact thereof on this study is addressed in Chapter 4.

### **3.7 ASSUMPTIONS**

The ARCS model is based on three underlying assumptions related to systematic motivational design. Firstly, motivation can be influenced by external conditions. Secondly, motivation linked to performance is a means to something and not an end. Thirdly, a systematic design can predictably impact motivation (Keller, 1999a).

The CIS and IMMS have been proven to be reliable and valid instruments in measuring learners' motivation to learn in relation to a specific course, and in measuring learners' motivation related to instructional materials (Keller, 1999a).

Participation was voluntary and data was collected from the two self-reported survey instruments. It is assumed that learners completed the surveys honestly and accurately with regard to their level of motivation.

### **3.8 RESEARCH ETHICS**

Saunders et al. (2010:183–184) define ethics as, “The appropriateness of your behaviour in relation to the rights of those who become the subject of your work or who are affected by it.” Ethical clearance was requested from and granted by the Faculty of Economic and Management Science at the University of Pretoria once the proposal of the study had been accepted by the faculty. Ethical clearance was obtained before any data collection could occur.

The covering letter accompanying the questionnaires took the following ethical issues into account:

- Voluntary participation was discussed with the participants, as well as the fact that they had the right to withdraw at any time.

- No incentives, monetary or otherwise, were provided to a participant for their participation in the study.
- All participants were required to give their consent to participate in this study.
- The confidentiality of the participants' responses in the questionnaires was assured.
- The anonymity of the participants was assured as no identifying information was requested in the questionnaires.

The covering letter addressing all the above ethical considerations appears in Appendix B.

### **3.9 CONCLUSION**

This chapter set out the research methodology and design, along with the sample selection, data collection tools, data analysis, quality assurance, and ethical considerations pertaining to this study. This ensured that the research objectives were met.

## CHAPTER 4

### DATA ANALYSIS

#### 4.1 INTRODUCTION

The purpose of this study was to test whether the motivation-enhancing tactics provided through the implementation of Voice-over-PowerPoint™ (VoP) videos would impact the motivation of adult learners. In addition, this study explored whether certain demographic factors produced any statistically significant differences in motivational levels. The study used Microsoft® PowerPoint™, Camtasia Studio (TechSmith), and ClickUp (Blackboard Inc.) for the delivery of the motivation-enhancing videos. Learner motivation was evaluated using two self-reporting surveys, namely, the Course Interest Survey (CIS), a situational measure for a specific course, and the Instructional Materials Motivation Survey (IMMS), a situational measure for a set of instructional materials. The descriptive statistics on the outcome of the surveys are provided in tables, which are then analysed to answer the research questions posed by this study.

Four research questions were scrutinised in the execution of this study:

1. Do Voice-over-PowerPoint™ (VoP) videos impact the learner's perception of their overall motivation as measured by the Instructional Materials Motivation Survey (IMMS)?
2. Is there an inter-correlation between the four motivational factors measured by the Instructional Materials Motivation Survey (IMMS) and Course Interest Survey (CIS)?
3. Does gender, age, language or student group have an impact on the overall motivation measured by the IMMS?
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?

## 4.2 ORIENTATION TO THE DATA ANALYSIS TECHNIQUE

### 4.2.1 Research methods review

This study used quantitative methods in a post-test-only, cross-sectional design. Two quantitative surveys were used to measure motivation: (1) The CIS, and (2) The IMMS. These two surveys were delivered in a web-based format. Detailed information regarding the two surveys used in this study is set out in the *Data Collection Instruments* sub-section of Chapter 3.

### 4.2.2 Population summary

The participants in this study were enrolled for a taxation course for non-degree purposes at a South African university in Pretoria. The participants formed part of a convenience sample, and the study was conducted over a period of approximately two months.

## 4.3 PRESENTATION OF THE FINDINGS

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). One of the drawbacks of web-based (online) surveys is the low response rates as compared to paper-based surveys (Nulty, 2008). However, in the distance education context, few viable alternatives exist given the lack of face-to-face contact. No universal norm for response rates in online surveys has been established, although Nulty (2008) finds the average response rate to be 33% for online surveys. The non-response bias for this population has been addressed in the upcoming demographics and sections regarding the findings.

### 4.3.1 Instruments

The Course Interest Survey (CIS) and the Instructional Materials Motivation Survey (IMMS) are situational measures that were intended to measure a learner's level of motivation regarding a particular course or instructional material, not general levels of motivation towards learning. Both these instruments were designed on the theoretical basis of the ARCS model, which was developed by Keller from a synthesis of psychological theories on human motivation based on empirical literature (Keller, 1979; Keller, 1987a; Keller, 1987b; Keller, 1987c). Many of the questions in the CIS and IMMS are alike in intent, but not in wording.

The CIS has 34 items, comprising eight items for Attention and Confidence each, and nine items for Relevance and Satisfaction each. The IMMS has 36 items consisting of 12 items for Attention, nine items for Relevance and Confidence each, and six items for Satisfaction. The response scales (Likert-type scale) ranged from 1 to 5 for both instruments (CIS and IMMS), with 1 being *Strongly Disagree* and 5 being *Strongly Agree*.

- **Scoring**

The scoring for both the CIS and IMMS could be calculated using two methods. The first method involves simply summing up the scores for each subscale and the total scale. This would result in a total score between the minimum of 34 and the maximum of 170 for the CIS, or between the minimum of 36 and the maximum of 180 for the IMMS. The preferred scoring method, as used in this study, is to find the average score for each sub-component and the average of the total instead of using the sums of these items. The average method is favoured due to the unequal size of the sub-components items. Each respondent's total score per sub-component is divided by the number of items in that scale, resulting in a score ranging from 1 to 5, which makes comparisons of each sub-component easier (Keller, 2010).

A designation of a high or low scores cannot be prescribed when using these instruments because there are no norms for these surveys as they are situational measures (Keller, 2010). In this study, a score of 3.5 and above was considered high as this score indicates



responses of mainly *Agree* and/or *Strongly Agree* to the items measuring motivational levels. Alternatively, a low score of 2.5 or less indicated mainly *Disagree* and/or *Strongly Disagree* responses. The range 2.6 – 3.4 would be considered as inconclusive as it teeters on the ambivalence of *Neither Agree nor Disagree*.

The descriptive statistics were calculated after the reverse items (nine in the CIS and ten in the IMMS) in each survey were recoded by reversing the Likert scale responses, 1 now being *Strongly Agree* (Keller, 2010).

- ***Demographics***

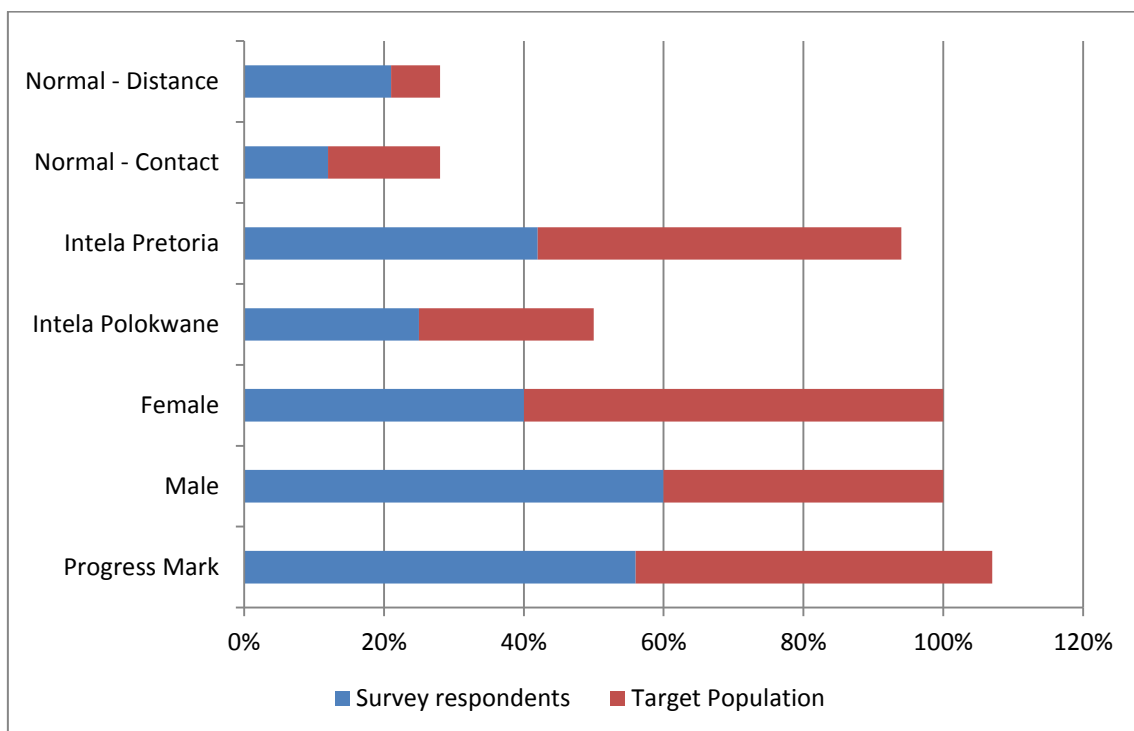
The majority of the respondents were male (60%), however males in the target population comprised only 40% of the enrolled learners. The respondents' ages ranged between 23 and 55, with an average age of 34. The majority of the learners (50%) fell within the 30 – 39 age bracket. The target population's average age was 32, with a minimum age of 22 and a maximum of 65, however, as with the respondents, the majority falls in the 30 – 39 age group. More detailed demographic information was discussed in the *Teaching Context* sub-section of Chapter 3.

#### **4.3.2 Response rates and the non-response bias**

Web-based online surveys are far less likely to illicit response rates as high as paper-based surveys, even with the use of various response boosting practices (Nulty, 2008). In Nulty's (2008) research, he found that online surveys resulted in an average response rate of 33%, while the University of Texas at the Austin Faculty Innovation Center also proposed an acceptable response rate of 30% for online surveys (Austin Faculty Innovation Center, 2010). A similar response rate of 31% was attained in the current study. Substantial variability is seen in response rate research. Only by revealing sample dispositions can full disclosure of survey response rates and survey non-response be attained (Johnson & Owens, 2002). On this premise, an analysis of the respondents as compared to the target population was undertaken (refer to Figure 4). 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 population. This showed a small variance, indicating that the level of learner engagement across respondents and the target population was relatively similar. The respondents and target population 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 population comprised females, however, 60% of the respondents were male.

**Figure 4: Respondents as compared to the target population.**



#### 4.4 DISCUSSION OF THE FINDINGS

The results from this study will be discussed commencing with the first research question and concluding with the fourth and final research question. All statistical data were analysed using SPSS version 24.0 for Windows.

#### 4.4.1 Research Question 1

Research Question 1: Do Voice-over-PowerPoint™ (VoP) videos impact the learner’s perception of their overall motivation as measured by the Instructional Materials Motivation Survey (IMMS)?

In order to answer this question, the effectiveness and impact of the motivationally enhancing tactics applied in the VoP videos on learner motivation were analysed using self-reported data from the IMMS for learners that watched the VoP videos. The IMMS is a situational measure of a learner’s motivational level relating to a set of instructional material, which in this case relates to the VoP videos. The objective was to determine how motivated learners felt after having viewed the VoP videos at an overall level, as well as for each sub-component (Attention, Relevance, Confidence and Satisfaction). The validity of the instrument had a documented reliability coefficient of 0.96 (Keller, 2010). In this study, the IMMS instrument had a Cronbach’s Alpha of 0.93.

- ***Overall Motivation as Measured by the IMMS***

In order to determine the overall motivational level of the learners who watched the VoP videos, the average score for all items in the IMMS was calculated. The overall 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 5 lists the mean scores and standard deviation for the four sub-components of the ARCS model.

**Table 5: Descriptive statistics for all sub-components.**

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

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 ( $M = 4.09$ ) (Refer to Table 5)

- **Attention as measured by the IMMS**

Like overall motivation, attention was measured using the sub-component items in the IMMS. A detailed explanation of the Attention component of the ARCS model was given in the sub-section *The ARCS Model of Motivation Design* in Chapter 2.

The attention sub-component of the IMMS comprised 12 items, five of which were reverse items. Previous testing resulted in a Cronbach's Alpha of 0.86 (Huett, 2006). In this study, the Attention sub-component produced a reliability Alpha of 0.94.

The mean score of nine items in the attention sub-component equalled or exceeded 4.0. Table 6 presents the means and standard deviations of the attention sub-component. More than 90% of the respondents *agreed* or *strongly agreed* that the information in the VoP was arranged in a manner that kept their attention (97.1% - Item 62), the quality held their attention (94.3% - Item 56), there was something interesting that got their attention (91.4% - Item 47), and that the VoP videos were not unappealing (91.2% - Item 60). Refer to Table 12 in Appendix D for the attention frequency table.

**Table 6: Mean scores and standard deviations of the attention sub-component**

No	Item	Mean	Std. Deviation
47	There was something interesting at the beginning of the VoP that got my attention.	4.23	0.60
53	The VoPs are eye-catching.	4.21	0.73
56	The quality of the VoP helped to hold my attention.	4.17	0.62
57	The content in the VoPs is so abstract that it was hard to keep my attention on them (recoded).	3.91	1.12
60	The VoPs looked dry and unappealing (recoded).	4.24	0.82
62	The way the information is arranged in the VoP helped keep my attention.	4.20	0.72
65	The VoP has things that stimulated my curiosity.	4.15	0.61

No	Item	Mean	Std. Deviation
67	The amount of repetition in the VoP caused me to get bored sometimes (recoded).	4.00	1.09
69	I learned some things from the VoP that were surprising or unexpected.	3.74	1.24
73	The variety of stories, exercises or pictures in the VoP helped keep my attention on the lesson.	4.03	0.97
74	The presentation style of the VoP is boring (recoded).	4.17	0.89
76	There is so much content in the VoP that it is irritating (recoded).	3.94	1.31

- **Relevance, as measured by the IMMS**

The Relevance sub-component was also measured in the IMMS. A detailed explanation of the Relevance component of the ARCS model is set out in the *ARCS Model of Motivation Design* sub-section of Chapter 2.

Relevance as a sub-component of the IMMS encompasses nine items, two of which are reverse items. Prior testing resulted in a Cronbach's alpha of 0.80 (Huett, 2006). In this study, the Relevance component produced a reliability Alpha of 0.96.

Table 7 presents the mean scores and standard deviation for the Relevance sub-component items. Item 78 yielded the highest mean score ( $M = 4.35$ ) of all the items across the entire survey, with more than 97% of the respondents *agreeing* or *strongly agreeing*, was that the content of the VoP was or would be useful to them. More than 90% of the respondents indicated that completing the exercise successfully after using the VoPs was important (94.3% - Item 55) and that the content was relevant and worth knowing (91.4% - Item 61 and 68). Refer to Table 13 in Appendix D for the relevance frequency table.

**Table 7: Mean scores and standard deviations of the relevance sub-component**

No	Item	Mean	Std. Deviation
51	It is clear to me how the content in the VoPs is related to things I already know.	3.97	0.77
54	There were stories, pictures, or examples in the VoP that showed me how the VOPs could be important to some people taking this module.	4.12	0.64
55	Completing the exercises successfully after using the VoPs was important to me.	4.23	0.547
61	The content of the VoPs is relevant to my interests.	4.09	0.919
63	There are explanations or examples of how people use the knowledge (or content) in the VoPs.	3.94	0.694
68	The content and style of presentation in the VoPs convey the impression that the content is worth knowing.	4.17	0.857
71	The content in the VoPs was not relevant to my needs because I already knew most of it.	4.14	0.81
75	I could relate the content of the VoPs to things I have seen, done, or thought about in my own life.	3.71	1.126
78	The content in the VoPs is (or will be) useful to me.	4.35	0.774

- **Confidence, as measured by the IMMS**

Confidence too was measured as part of the IMMS sub-component, which was detailed in *The ARCS Model of Motivation Design* sub-section of Chapter 2.

The confidence sub-component of the IMMS comprised nine items, four of which were reverse items. Prior studies resulted in a Cronbach's Alpha of 0.85 (Huett, 2006). In this study, the Confidence component produced a reliability Alpha of 0.95.

The means and standard deviations for the confidence sub-component items are displayed in Table 8, where seven of the items mean scores exceeded 4.11. The majority (97.1% - Item 80) of the respondents *agreed* or *strongly agreed* that the well organised content helped their confidence in terms of learning the material, with over 90% confident that they could easily learn and pass a test on the content of the VoPs (Items 46, 58 and 70). Refer to Table 14 in Appendix D for the confidence frequency table.

**Table 8: Mean scores and standard deviations of the confidence sub-component**

No	Item	Mean	Std. Deviation
46	When I first watched the VoPs, I had the impression that the content would be easy for me.	4.21	0.687
48	The material in the VoPs was more difficult to understand than I would like for it to be (recoded)	4.12	0.977
49	After using the VoPs, I felt confident that I knew what I was supposed to learn from the VoPs.	4.12	0.857
52	Many of the VoPs had so much information that it was hard to pick out and remember the important points (recoded).	3.83	1.124
58	As I used the VoPs, I was confident that I could learn the content.	4.2	0.759
64	The exercises in the VoPs were too difficult (recoded).	3.79	1.008
70	After using the VoPs for a while, I was confident that I would be able to pass a test on the material.	4.18	0.797
79	I could not really understand quite a bit of the material in the VoPs (recoded).	4.17	0.985
80	The good organisation of the content in the VoPs helped me to be confident that I would learn the material.	4.32	0.638

- **Satisfaction, as measured by the IMMS**

Finally, satisfaction was measured using the sub-component items in the IMMS, as set out in the sub-section on *The ARCS Model of Motivation Design* in Chapter 2.

The sub-component satisfaction of the IMMS consisted of six items, none of which were reverse items. This sub-component had previously resulted in a Cronbach's Alpha of 0.86 (Huett, 2006). In this study, the relevance component produced a reliability Alpha of 0.95.

Table 9 displays the means and standard deviations for the satisfaction items, where the majority of the items resulted in mean scores greater than 4.12. The responses were mainly favourable towards satisfaction, relating to the use of VoP videos and the content therein, with more than 90% responding *agree* or *strongly agree* (Items 50, 66, 77 and 81). Refer to Table 15 in Appendix D provides the detailed satisfaction frequency table.

**Table 9: Mean scores and standard deviations of the satisfaction sub-component.**

No	Item	Mean	Std. Deviation
50	Completing the exercises in the VoPs gave me a satisfying feeling of accomplishment.	4.13	0.751
59	I enjoyed the VoPs so much that I would like to know more about this topic.	3.88	1.038
66	I really enjoyed studying the material in the VoPs.	4.26	0.611
72	The wording of feedback after the exercises or of other comments in the VoPs helped me feel rewarded for my effort.	3.76	1.156
77	It felt good to successfully use the VoPs.	4.31	0.631
81	It was a pleasure to use such well-designed VoPs.	4.23	0.77

In short, 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.

#### **4.4.2 Research Question 2**

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)?

The CIS, like the IMMS, is a situational measure of a learner's motivational level. In the case of the CIS, it measures motivation relating to a specific course rather than instructional material as with the IMMS. The objective here was to determine the relationship between the four sub-components using the Pearson's correlation coefficient as the measure for both the IMMS and CIS instruments.

Table 10 represents the inter-correlation coefficients between the four sub-components measured by the IMMS and CIS. 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 10: Inter-correlations between the four sub-components (IMMS and CIS).**

Sub-components	Attention		Relevance		Confidence		Satisfaction	
	IMMS	CIS	IMMS	CIS	IMMS	CIS	IMMS	CIS
<b>Attention</b>	-	-	-	-	-	-	-	-
<b>Relevance</b>	0.73**	0.57**	-	-	-	-	-	-
<b>Confidence</b>	0.83**	0.51**	0.69**	0.45*	-	-	-	-
<b>Satisfaction</b>	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.

#### **4.4.3 Research Question 3**

Research Question 3: Does gender, age, language or student group have an impact on the overall motivation measured by the IMMS?

The goal was to determine whether any particular demographic factor statistically influenced the impact of the use of the VoP videos on learner motivation. To achieve this objective, a Pearson's Chi-Squares test ( $\chi^2$ ) was conducted between the various sub-components and gender, age, language, and student group to determine whether any differences were statistically significant.

- **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 (second language being English)**

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 VoPs ( $\chi^2 = 30.06$ ,  $p = 0.46$ ).

- **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.

#### **4.4.4 Research Question 4**

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?

As previously mentioned, the CIS instrument is a situational measure of a learner's motivational level regarding a specific course. The aim was to determine 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. 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.

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 ( $p = 0.03$ ). Chapter 5 explores the possible explanations for these findings.

#### 4.4.5 Anecdotal data

The online survey contained qualitative items to obtain learner feedback (likes, dislikes and recommendations) that could be applied in the design and implementation of future educational media at the university. The general feedback showed that the learners benefitted and appreciated the introduction of the VoP videos as supplementary course material. The learners who did not watch the VoP videos mentioned difficulty in downloading or accessing the tools. A popular recommendation was the request for more VoP videos for each topic. Learner comments included:

##### **Likes**

*“I particularly liked the examples given in the VOP and they also assisted me with exam technique.”*

*“VOP gave me a clear understanding of the content I was studying. It is much clearer and easier to understand than some of the lectures.”*

*“I felt more confident to approach answering those questions in Test 6”*

*“It is extremely clear and concise. The content was very well explained and many light bulb moments experienced by me personally. I would definitely like to see more of these VOP. Perhaps even on every lecture. That would greatly help.”*

*“There is a lot of information in class. This summarises and just brings everything together. One can pause and replay as you go along. This is also much better than the lecture recordings. They are too long and time consuming. I have not been able to do them [lecture recordings], because of time constraints.”*

## **Dislikes**

*“The VOP was more complex and complicated such that it became new content on its own when my expectation was to use it as supplementary study material for support to make my studies easy.”*

*“Time consuming.”*

## **4.5 SUMMARY OF THE RESEARCH 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 regarding the course for learners who watched the VoP videos when compared to those who did not.

The following chapter explores the data analysis findings in greater detail, and provides the limitations and suggestions for further research based on this research.

## CHAPTER 5

### CONCLUSION

#### 5.1 INTRODUCTION

This chapter provides an overview of the outcomes of this study on learner motivation. The findings are examined along with the implications of the results, followed by the limitations of the study, and lastly concluding with recommendations for future research.

- ***Research objective and results***

The primary objective of this study was to ascertain whether external conditions could impact learner motivation. The external conditions in this study comprised systematically applied motivational tactics based on the ARCS model. The delivery medium used comprised Voice-over-PowerPoint™ (VoP) videos made available for use through the university's Learner Management System, ClickUp (Blackboard, Inc.).

This study further investigated any significant inter-correlations between the motivational sub-components, the impact (if any) of certain demographic factors, and the overall course motivation differences for learners who had used the instructional materials (VoPs) and those who did not.

The population consisted of students enrolled for a distance education course for non-degree purposes. Auxiliary motivation tactics in the form of VoP videos, based on the ARCS model, were provided as supplementary (revision) instructional material to their normal course material.

The results, measured by the IMMS, indicated that the VoP video users were motivated at an overall level by the use of the motivational tools ( $M = 4.09$ ). The Confidence sub-component scored the highest ( $M = 4.10$ ) of the four ARCS sub-components, with over 90% of the respondents confident that they could easily learn and pass a test on the content of the VoP videos.

This study, along with numerous others, established the strong inter-relationship between most of the ARCS components in both the CIS and IMMS (Huett, 2006; Bollinger *et al.*, 2010).

No statistically significant differences were noted based on the demographic factors (age, gender, language, or student group).

Overall, course motivational scores, measured by the CIS, for learners who had used the VoP videos and those who did not produced statistically significant differences ( $p = 0.02$ ). Satisfaction came out on top with a statistically significant difference of 0.003. It is not unreasonable to conclude that satisfaction was effected without being specifically targeted in the design of the tool, considering that motivation and satisfaction are inter-dependent (one does not exist without the other), at least to some extent.

This study advocates the viability of impacting overall learner motivation through the inclusion of external conditions such as the methodical application of motivation enhancing tactics. The research further supported prior studies in establishing the reliability of the survey instruments (CIS  $\alpha = 0.92$  and IMMS  $\alpha = 0.93$ ), as well as the effectiveness of the ARCS model as a feasible tool to impact learner motivation. The reliability results promoted both Huett (2006) and Gabrielle's (2003) conversion of the surveys to a web-based format.

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).



## 5.2 INTERPRETATION OF THE RESEARCH QUESTIONS

1. Do Voice-over-PowerPoint™ (VoP) videos impact the learner's perception of their overall motivation as measured by the Instructional Materials Motivation Survey (IMMS)?

Essentially, there were two parts to Research Question 1. The first part examined the effect of external conditions, in this case the use of VoP videos, on overall learner motivation in adult learners. The results indicate that VoP video users were motivated at an overall level by using these videos. This is in line with the expectation of this study, based on the results of Bollinger *et al.* (2010), which showed that podcast users in an online learning environment were motivated overall by using the podcasts.

The instructional materials were designed with a focus on attention and confidence with limited tactics for relevance and confidence resulting from the gap analysis. The second part of Research Question 1 thus sought to investigate whether the instructional materials affected learner attention and confidence, as measured by the IMMS. Theoretically, one would expect the results to reflect the targeted components of attention and confidence would produce the highest mean scores. The quantitative results revealed the highest motivational score for confidence ( $M = 4.10$ ), with attention and relevance scoring the lowest score (both at  $M = 4.08$ ). The marginally lower attention score still indicates that the learners' attention was attained and sustained by the VoP videos. The marginally lower attention score may be due to the notion that affecting learners' attention is more challenging than the other sub-components in distance-based education.

A high level of learner confidence resulted from over 90% of the responses, indicating that they were confident that they could easily learn and pass a test on the VoP content given the well organised material therein. This resulted from seven of the nine confidence items, scoring a mean greater than 4.1. These high scores may be due to the fact that examples in the VoP began with simple concepts then gradually increased in difficulty. The structure was also designed to explain a theoretical component and then apply that component to an example in order to build the learners' confidence gradually.

The second highest score, satisfaction, resulted from four of the six items scoring in excess of 4.2, indicating that learners were satisfied with the use of the VoP videos. More than 90%

of the responses indicated that the learners enjoyed using, studying, and completing the exercises in the VoP material, resulting in high levels of satisfaction.

Three-quarters of the attention items scored a mean of 4 or higher. Many learners found the design of the VoP videos attention grabbing and sufficiently stimulating to sustain their attention. These results could possibly be attributed to the *novelty* effect of VoP videos in this course, or the fact that the VoP videos were appropriately designed to grab and maintain attention.

Relevance produced the item yielding the highest item mean score ( $M = 4.35$ ) across the entire IMMS, with more than 97% of the respondents indicating that the content of the VoP was or would be highly useful to them. This may be attributed to the fact that the learners elected to enrol for this course to further their education and careers in the accountancy field, hence inherent relevance was already high.

Prior research applying the ARCS model where more than one ARCS component was targeted showed increases in confidence in the IMMS as in the current study (Gabrielle, 2003; Bollinger *et al.*, 2010).

2. Is there an inter-correlation between the four motivational factors measured by the Instructional Materials Motivation Survey (IMMS) and Course Interest Survey (CIS)?

The second question ascertained whether the sub-components correlated with one another and to what extent. Inter-correlations were evident between all four sub-components, which were statistically significant at the 0.01 level. The highest correlation was measured in the IMMS between attention and confidence ( $r = 0.83$ ). The CIS showed relevance and satisfaction to have the highest correlation ( $r = 0.62$ ). For both the IMMS and CIS instruments, relevance and confidence presented the lowest correlations.

3. Does gender, age, language or student group have an impact on the overall motivation measured by the IMMS?

The third question sought to determine whether certain demographic factors would reveal any statistically significant differences in terms of the overall motivational mean score, as measured by the IMMS.

Gender differences in overall motivation existed with males reporting higher levels of motivation than females, although the differences were not statistically significant. It is reasonable to expect differences between male and female responses as each gender is inclined to react differently based on their learning preferences (Wehrwein *et al.*, 2007).

All ages were motivated by the use of the VoP videos, however, the 30 to 39 age group showed slightly less motivation than the 20 to 29 and 40+ age groups. Again, although differences existed, none proved statistically significant. The 20-something age group may have been more motivated considering that they are technologically voracious and the e-learning tool fed their learning appetite. For the 40+ group, the novelty effect of using educational technology may have impacted their motivational response.

First language English showed no statistically significant differences, although small nominal differences existed.

All of the student groups were motivated at an overall level by the use of the VoP videos, and no statistically significant differences existed. Surprisingly, 'pure' distance students (students that did not attend any contact classes) exhibited lower overall motivational levels as compared to the other student groups, although they were still motivated, just to a lesser extent. The expectation was that distance students would show the highest levels of motivation from the introduction of a digital medium designed to reduce the transactional distance and sense of isolation. These results may, in part, be attributed to the reasoning that distance learners are inherently less motivated than traditional learners due to the sense of isolation and lack of social presence (Bollinger *et al.*, 2010; Lee & Chan, 2007). It is also possible that the small sample size may have impacted the results.

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?

The intention of the final question was to assess whether the use of the motivational tactics correlated with any statistically significant differences between the two groups. The results revealed that the learners who used the VoP videos had the highest mean rank and the difference was statistically significant ( $p = 0.02$ ). Interestingly, satisfaction resulted in the most statistically significant difference between the two groups ( $p = 0.003$ ), with attention also showing statistically significant differences below .05. However, confidence and relevance showed no significant differences statistically. These results are interesting as the tools were designed to affect attention and confidence specifically. Such results may be explained by the notion that the tool was inadequately designed to affect learner confidence, or the somewhat controversial idea that it is not possible to isolate the individual component of confidence due to its abstract dimensions, thereby potentially diminishing the conceptual validity of the model (Huett, 2006; Naime-Diefenbach, 1991; Babe 1995).

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.

Finally, the study suggests that the use of educational technology, such as VoP, seems to be effective mediums to deliver motivationally-enhancing tactics.

### **5.3 IMPLICATIONS OF THE FINDINGS**

The importance of motivation as an aspect of learning is well noted in the existing literature, however, there is a lack of empirical research examining motivation in adult learning, distance education, online education, and technology-mediated learning environments

(Gabrielle, 2003; Moller *et al.*, 2005; Means *et al.*, 1997; J Visser & Keller, 1990; L Visser, 1998).

Satisfying the motivational need of adult learners in distance-based education creates its own challenges for instructional designers (Keller, 1999b). This study applied a blended learning approach to enhance a distance-based course by supplementing course material with educational technology for learners to access at their convenience. The educational technology was systematically designed to include motivationally-enhancing tactics to address the identified needs of the learner population (attention and confidence).

The aim of this study was to address the gap in the literature regarding motivation in adult and distance education, specifically addressing three gaps in the literature: (1) Impacting the motivation of adult distance-based learners through the systematic application of distinctively designed tactics; (2) Enhancing learner support (decreasing transactional distance) through the provision of revision material using technology-based strategies, and; (3) Using educational technology to deliver these interventions.

This study was inspired by the problem-solving theoretical base of Keller's ARCS model of motivational design, as well as previous studies on technology-based motivational strategies (Bollinger *et al.*, 2010; L Visser, 1998; Gabrielle, 2003; Huett, 2006; J Visser & Keller, 1990). This study confirms that the use of systematically designed educational technology can be effective and efficient in improving learner motivation in adult learners in distance-based education. It further contributes to the premise that learner support (through the reduction of transactional distance) has a motivational effect on distance learners. These tactics are suggested to foster motivation and performance in e-learning, blended learning, and traditional classroom-based environments.

These results should encourage any instructor to implement educational media (like VoPs) in their courses, allowing students to learn at their own pace and time, as well as personalising the self-directed learning environment.

Finally, this study supports the viability of applying the ARCS model via a technological vehicle designed to impact learner motivation. This will be beneficial to educators seeking to implement similar technology over generally available applications or platforms.

#### **5.4 LIMITATIONS OF THIS RESEARCH**

This study was conducted at one educational institution in a limited geographical area, therefore the results of the study are generalisable to a population sharing the descriptive characteristics of the target population. Specifically, learners at a tertiary institution enrolled in an accountancy-related course for non-degree purposes. Participation was voluntary, and data was collected through self-reported survey instruments. The sample size was relatively small, further limiting the generalisability of the findings.

A convenience sample was used and there may thus be an adverse effect from a non-response bias, however, there is no indication of this in the data.

The ARCS model of motivational design was designed to motivate a reasonably typical learner, one who is co-operative and interested in learning. The model is not designed to address or modify the behaviour of learners that may be indifferent, bored or even antagonistic.

Testing for performance improvement was not feasible in this study, although Keller himself does not advocate the ARCS model as a performance enhancing framework as it is designed to be a model for motivational design and not performance enhancements (Keller, 1999a).

Motivationally-enhancing tactics were designed based on the researcher's interpretation of motivational tactics. This was also based on the researcher's own experience, as well as adaptations of the earlier works of Gabrielle (2003), Bollinger *et al.* (2010), L Visser (1990), and Huett (2006).

## **5.5 RECOMMENDATIONS FOR FUTURE RESEARCH**

This study could be replicated due to the scientific controls implemented in this study, with a different population or across multiple populations simultaneously to ascertain whether significant differences in motivation could be found.

A similar study could be replicated including aspects to measure improvements in learner performance in either distance- or traditional-based education.

The participating learners discussed the benefits of and provided recommendations for the improvement of the VoP videos that could assist educators in refining the design and implementation of similar tactics.

Increasing the duration of a future study with multiple survey intervals could indicate statistically significant differences in the motivational impact thereof and the four sub-components over time, considering that levels of motivation vary.

Also, further studies should 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.

## **5.6 CONCLUDING REMARKS**

The current study was designed based on the main premise that learner motivation can be impacted by external conditions, using the ARCS model, in a blended learning environment.

This research study concludes that adult learners using ARCS-based motivationally-enhanced VoP videos were motivated at an overall level. It was further shown that the confidence-based tactics employed produced the most effective results, as measured by the IMMS. The study also added to prior studies applying the ARCS model for motivational design, thereby further solidifying the theoretical base of this model as an overall motivational model.

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**APPENDIX A:  
DATA COLLECTION INSTRUMENTS**

**SECTION B: COURSE INTEREST SURVERY (CIS)**

**SECTION C: INSTRUCTIONAL MATERIALS MOTIVATIONAL SURVEY  
(IMMS)**

**SECTION A**

1. Do you agree to participate in the study on a voluntary basis as set out in the instructions (covering letter)?

Yes	
No	

- 2 How old are you?

- 3 Gender

Male	Female	Prefer not to state
------	--------	---------------------

- 4 How would you describe your cultural background?

Asian	Black	Coloured	Indian	White	Other
-------	-------	----------	--------	-------	-------

- 5 What is your mother tongue?

Afrikaans	
English	
isiNdebele	
isiXhosa	
isiZulu	
Sepedi	
Sesotho	
Setswana	
siSwati	
Tshivenda	
Xitsonga	
Other	

- 6 If 'Other' please specify

- 7 To which student group do you belong?

Intela Polokwane	
Intela Pretoria	
Normal course user – contact	
Normal course user - distance	

- 8 Did you watch any of the Individuals and/or Fringe Benefits Voice-over-PowerPoint™ (VoP)?

No	
Yes, Individuals	
Yes, Fringe Benefits	
Yes, Both (Individuals & Fringe Benefits)	

**9. If answered 'Yes' in 7, how many parts of the VoP did you watch?**

All (8 parts)	
Most (4-7 parts)	
A few (3 or less)	
I did not watch any of the Individuals or Fringe Benefits Voice-over-PowerPoint™ (VoPs)	

**10 If answered 'No' in 7, what was your reason for not watching the VoP?**

I answered "yes" to watching the VoP	
Time constraints	
No access to internet/data when studying	
Problem accessing/downloading	
Do not have a compatible device (i.e. smartphone/Tablet/Computer)	
Did not know about the VoP	
Did not think it was necessary or worthwhile	
Other	

**11 If 'Other' please specify**

--

If you answered 'Yes' to item 7 (Yes, you watched the VoPs), please complete section B & C (questions 12 to 81)

If you answered 'No' to item 7 (No, you did not watch the VoPs) please complete section B ONLY (questions 12 to 45).





## SECTION B

The following questions relate to the course material (NOT the Voice-over-PowerPoint™) and should be completed by all students.

Course material includes lectures (contact sessions or DVD's), sound files of lectures, learning objectives, class notes, additional questions and any additional study material, excluding the Voice-over-PowerPoint™ on Individuals and Fringe benefits. Please rate the statements below:

		Strongly agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
12	The course material is structured in a manner that makes me feel enthusiastic about the course.	5	4	3	2	1
13	The things I am learning in this course will be useful to me.	5	4	3	2	1
14	I feel confident that I will do well in this course.	5	4	3	2	1
15	The course material has very little in it that captures my attention.	5	4	3	2	1
16	The course material makes the subject matter of this course feel important.	5	4	3	2	1
17	You have to be lucky to get good grades in this course.	5	4	3	2	1
18	I have to work hard to succeed in this course.	5	4	3	2	1
19	I do NOT see how the content of this course relates to anything I already know	5	4	3	2	1
20	Whether or not I succeed in this course is up to me.	5	4	3	2	1
21	The course material creates suspense when building up to a point (or conclusion).	5	4	3	2	1
22	The subject matter of this course is just too difficult for me.	5	4	3	2	1
23	I feel that this course gives me a lot of satisfaction.	5	4	3	2	1
24	In this course, I try to set and achieve high standards of excellence.	5	4	3	2	1
25	I feel that the grades or other recognition I receive are fair (or are fair when compared to other students).	5	4	3	2	1
26	I am curious about the subject matter of this course.	5	4	3	2	1
27	I enjoy working for this course	5	4	3	2	1
28	It is difficult to predict what grade the instructor will give my assignment(s).	5	4	3	2	1
29	I am pleased with the instructor's evaluation of my work compared to how well I think I have done.	5	4	3	2	1
30	I feel satisfied from what I am getting from this course	5	4	3	2	1



		Strongly agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
31	The content of this course relates to my expectations and goals.	5	4	3	2	1
32	The course material approaches the content in an unusual or surprising manner that makes learning interesting.	5	4	3	2	1
33	The students actively engage with the course material.	5	4	3	2	1
34	To accomplish my goals, it is important that I do well in this course.	5	4	3	2	1
35	The course material uses an interesting variety of teaching techniques.	5	4	3	2	1
36	I do NOT think I will benefit much from this course.	5	4	3	2	1
37	I often daydream when I am working thought the course material.	5	4	3	2	1
38	As I am taking this course, I believe that I can succeed if I try hard enough.	5	4	3	2	1
39	The personal benefits of this course are clear to me.	5	4	3	2	1
40	My curiosity is often stimulated by the questions asked or the problems given on the subject matter in the course material.	5	4	3	2	1
41	I find the challenge level in this course to be about right: neither too easy nor too hard.	5	4	3	2	1
42	I feel rather disappointed with this course.	5	4	3	2	1
43	I feel that I get enough recognition of my work in this course by means of grades, comments, or other feedback.	5	4	3	2	1
44	The amount of work I have to do is appropriate for this type of course.	5	4	3	2	1
45	I get enough feedback to know how well I am doing.	5	4	3	2	1



## SECTION C

The following questions relate to the Voice-over-PowerPoint™ (VoP) for Individuals and Fringe Benefits for this course. Please rate the statements below:

		Strongly agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
46	When I first watched the VoP, I had the impression that the content would be easy for me.	5	4	3	2	1
47	There was something interesting at the beginning of the VoP that got my attention.	5	4	3	2	1
48	The material in the VoP was more difficult to understand than I would like for it to be.	5	4	3	2	1
49	After using the VoP, I felt confident that I knew what I was supposed to learn from the VoP.	5	4	3	2	1
50	Completing the exercises in the VoP gave me a satisfying feeling of accomplishment.	5	4	3	2	1
51	It is clear to me how the content in the VoP is related to things I already know.	5	4	3	2	1
52	Many of the VoP had so much information that it was hard to pick out and remember the important points.	5	4	3	2	1
53	The VoP are eye-catching.	5	4	3	2	1
54	There were stories, pictures, or examples in the VoP that showed me how the VoP could be important to some people taking this module.	5	4	3	2	1
55	Completing the exercises successfully after using the VoP was important to me.	5	4	3	2	1
56	The quality of the VoP helped to hold my attention.	5	4	3	2	1
57	The content in the VoPs is so abstract that it was hard to keep my attention on them.	5	4	3	2	1
58	As I used the VoP, I was confident that I could learn the content.	5	4	3	2	1
59	I enjoyed the VoP so much that I would like to know more about this topic.	5	4	3	2	1
60	The VoP look dry and unappealing.	5	4	3	2	1
61	The content of the VoP is relevant to my interests.	5	4	3	2	1
62	The way the information is arranged in the VoP helped keep my attention.	5	4	3	2	1



		Strongly agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
63	There are explanations or examples of how people use the knowledge (or content) in the VoP.	5	4	3	2	1
64	The exercises in the VoP were too difficult.	5	4	3	2	1
65	The VoP has things that stimulated my curiosity.	5	4	3	2	1
66	I really enjoyed studying the material in the VoP.	5	4	3	2	1
67	The amount of repetition in the VoP caused me to get bored sometimes.	5	4	3	2	1
68	The content and style of presentation in the VoP convey the impression that the content is worth knowing.	5	4	3	2	1
69	I learned some things from the VoP that were surprising or unexpected.	5	4	3	2	1
70	After using the VoP for a while, I was confident that I would be able to pass a test on the material.	5	4	3	2	1
71	The content in the VoP was not relevant to my needs because I already knew most of it.	5	4	3	2	1
72	The wording of feedback after the exercises, or of other comments in the VoP, helped me feel rewarded for my effort.	5	4	3	2	1
73	The variety of stories, exercises or pictures in the VoP helped keep my attention on the lesson.	5	4	3	2	1
74	The presentation style of the VoP is boring.	5	4	3	2	1
75	I could relate the content of the VoP to things I have seen, done, or thought about in my own life.	5	4	3	2	1
76	There is so much content in the VoP that it is irritating	5	4	3	2	1
77	It felt good to successfully use the VoP.	5	4	3	2	1
78	The content in the VoP is (or will be) useful to me.	5	4	3	2	1
79	I could not really understand quite a bit of the material in the VoP.	5	4	3	2	1
80	The good organization of the content in the VoP helped me be confident that I would learn the material.	5	4	3	2	1
81	It was a pleasure to use such well-designed VoPs.	5	4	3	2	1



## SECTION D

Please give your opinion about the VoP

- 82 What do you like about the VoP?
- 83 What don't you like about the VoP?
- 84 What do you think should be changed to improve the VoP?
- 85 Recommendations and suggestions



**APPENDIX B:**  
**INFORMED CONSENT FORM**



## Informed consent for participation in an academic research study

### The perceived motivational impact of Voice-over-PowerPoint™ on part-time adult learners' in a distance learning environment

Research conducted by:

Mrs L Brits (99157111)

Cell: 083 631 1760

Dear Respondent

You are invited to participate in an academic research study conducted by Lorena Brits, a Masters student from the Department of Taxation at the University of Pretoria.

The purpose of the study is interested in studying students' levels of motivation with the use of Voice-over-PowerPoint™ (screencasts) in a blended learning environment at the University of Pretoria

Please note the following:

- This study involves an anonymous survey. Your name will not appear on the questionnaire and the answers you give will be treated as strictly confidential. You cannot be identified in person based on the answers you give.
- Your participation in this study is very important to us. You may, however, choose not to participate and you may also stop participating at any time without any negative consequences.
- Please answer the questions in the attached questionnaire as completely and honestly as possible. This should not take more than 30 minutes of your time.
- The results of the study will be used for academic purposes only and may be published in an academic journal. We will provide you with a summary of our findings on request.
- Please contact my supervisor, Mrs T van Oordt, [theresa.vanoordt@up.ac.za](mailto:theresa.vanoordt@up.ac.za) if you have any questions or comments regarding the study.

Please sign the form to indicate that:

- You have read and understand the information provided above.
- You give your consent to participate in the study on a voluntary basis.

---

**Respondent's signature**

---

**Date**

**APPENDIX C:**

**STRATEGIES FOR ATTENTION, RELEVANCE, CONFIDENCE AND  
SATISFACTION**



**Table 11: Strategies for attention, relevance, confidence and satisfaction**

<b>Attention Strategies</b>	
<b>A1:</b>	<i>Incongruity, Conflict</i>
A1.1	Introduce a fact that seems to contradict the learner's past experience.
A1.2	Present an example that does not seem to exemplify a given concept.
A1.3	Introduce two equally plausible facts or principles, only one of which can be true
A1.4	Play devil's advocate.
<b>A2:</b>	<i>Concreteness</i>
A2.1	Show visual representations of any important object or set of ideas or relationships.
A2.2	Give examples of every instructionally important concept or principle.
A2.3	Use content-related anecdotes, case studies, biographies, etc.
<b>A3:</b>	<i>Variability</i>
A3.1	In stand up delivery, vary the tone of your voice, and use body movement, pauses and props.
A3.2	Vary the format of instruction (information presentation, practice, testing, etc.) according to the attention span of the audience.
A3.3	Vary the medium of instruction (platform delivery, film, video, print, etc.)
A3.4	Break up print materials by use of white space, visuals, tables, different typefaces, etc.
A3.5	Change the style of presentation (humorous-serious, fast-slow, loud-soft, active passive, etc.)
A3.6	Shift between student-instructor interaction and student-student interaction.
<b>A4:</b>	<i>Humour</i>
A4.1	Where appropriate, use plays on words during redundant information presentation.
A4.2	Use humorous introductions.
A4.3	Use humorous analogies to explain and summarize.
<b>A5:</b>	<i>Inquiry</i>
A5.1	Use creativity techniques to have learners create unusual analogies and associations to the content.
A5.2	Build in problem solving activities at regular intervals.
A5.3	Give learners the opportunity to select topics, projects and assignments that appeal to their curiosity and need to explore.
<b>A6:</b>	<i>Participation</i>
A6.1	Use games, role plays, or simulations that require learner participation.
<b>Relevance Strategies</b>	
<b>R1:</b>	<i>Experience</i>
R1.1	State explicitly how the instruction builds on the learner's existing skills.
R1.2	Use analogies familiar to the learner from past experience.
R1.3	Find out what the learners' interests are and relate them to the instruction.
<b>R2:</b>	<i>Present Worth</i>
R2.1	State explicitly the present intrinsic value of learning the content, as distinct from its value as a link to future goals.
<b>R3:</b>	<i>Future Usefulness</i>
R3.1	State explicitly how the instruction relates to future activities of the learner.
R3.2	Ask learners to relate the instruction to their own future goals (future wheel).
<b>Relevance Strategies (continued)</b>	



<b>R4: Need Matching</b>
R4.1 To enhance achievement striving behaviour, provide opportunities to achieve standards of excellence under conditions of moderate risk.
R4.2 To make instruction responsive to the power motive, provide opportunities for responsibility, authority, and interpersonal influence.
R4.3 To satisfy the need for affiliation, establish trust and provide opportunities for no-risk, cooperative interaction.
<b>R5: Modelling</b>
R5.1 Bring in alumni of the course as enthusiastic guest lecturers.
R5.2 In a self-paced course, use those who finish first as deputy tutors.
R5.3 Model enthusiasm for the subject taught.
<b>R6: Choice</b>
R6.1 Provide meaningful alternative methods for accomplishing a goal.
R6.2 Provide personal choices for organizing one's work.
<b>Confidence Strategies</b>
<b>C1: Learning Requirements</b>
C1.1 Incorporate clearly stated, appealing learning goals into instructional material.
C1.2 Provide self-evaluation tools which are based on clearly stated goals.
C1.3 Explain the criteria for evaluation of performance.
<b>C2: Difficulty</b>
C2.1 Organise materials on an increasing level of difficulty; that is , structure the learning material to provide a "conquerable" challenge.
<b>C3: Expectations</b>
C3.1 Include statements about the likelihood of success with given amounts of effort and ability.
C3.2 Teach students how to develop a plan of work that will result in goal accomplishment.
C3.3 Help students set realistic goals.
<b>C4: Attributions</b>
C4.1 Attribute student success to effort rather than luck or ease of task when appropriate (i.e. when you know it's true!).
C4.2 Encourage student's efforts to verbalise appropriate attributions for both successes and failures.
<b>C5: Self-confidence</b>
C5.1 Allow students opportunity to become increasingly independent in learning and practicing a skill.
C5.2 Have students learn new skills under low risk conditions, but practice performance of well-learned tasks under realistic conditions.
C5.3 Help students understand that the pursuit of excellence does not mean that anything short of perfection is failure; learn to feel good about genuine accomplishment.
<b>Satisfaction Strategies</b>
<b>S1: Natural Consequences</b>
S1.1 Allow a student to use a newly acquired skill in a realistic setting as soon as possible.



S1.2	Verbally reinforce a student's intrinsic pride in accomplishing a difficult task.
S1.3	Allow a student who masters a task to help others who have not yet done so.
<b>S2: <i>Unexpected Rewards</i></b>	
S2.1	Reward intrinsically interesting task performance with unexpected, non-contingent rewards.
S2.2	Reward boring tasks with extrinsic, anticipated rewards.
<b>S3: <i>Positive Outcomes</i></b>	
S3.1	Give verbal praise for successful progress or accomplishment.
S3.2	Give personal attention to students.
S3.3	Provide informative, helpful feedback when it is immediately useful.
S3.4	Provide motivating feedback (praise) immediately following task performance.
<b>S4: <i>Negative Influences</i></b>	
S4.1	Avoid the use of threats as a means of obtaining task performance.
S4.2	Avoid surveillance (as opposed to positive attention).
S4.3	Avoid external performance evaluations whenever it is possible to help the student evaluate his or her own work.
<b>S5: <i>Scheduling</i></b>	
S5.1	Provide frequent reinforcements when a student is learning a new task.
S5.2	Provide intermittent reinforcement as a student becomes more competent at a task.
S5.3	Vary the schedule of reinforcements in terms of both interval and quantity.

Source: (Keller, 1987a)



**APPENDIX D:**  
**FREQUENCY TABLES**



Table 12: Attention frequency table

Item Number	47. There was something interesting at the beginning of the VoP that got my attention.		56. The quality of the VoP helped to hold my attention.		60. The VoP look dry and unappealing (recoded).		62. The way the information is arranged in the VoP helped keep my attention.	
Rating Scale	Fq	%	Fq	%	Fq	%	Fq	%
0	-	-	-	-	-	-	-	-
1	-	-	-	-	1	2.9%	1	2.9%
2	-	-	1	2.9%	-	-	-	-
3	3	8.6%	1	2.9%	2	5.9%	-	-
4	21	60.0%	24	68.6%	18	52.9%	24	68.6%
5	11	31.4%	9	25.7%	13	38.2%	10	28.6%
= 4 + 5		<b>91.4%</b>		<b>94.3%</b>		<b>91.2%</b>		<b>97.1%</b>
Total	35	100%	35	100%	34	100%	35	100%
Missing	-		-		1		-	
Total	35		35		35		35	

Table 13: Relevance frequency table

Item Number	55. Completing the exercises successfully after using the VoP was important to me.		61. The content of the VoP is relevant to my interests.		68. The content and style of presentation in the VoP convey the impression that the content is worth knowing.		78. The content in the VoP is (or will be) useful to me.	
Rating Scale	Fq	%	Fq	%	Fq	%	Fq	%
0	-	-	-	-	-	-	-	-
1	-	-	2	5.7%	1	2.9%	1	2.9%
2	-	-	-	-	1	2.9%	-	-
3	2	5.7%	1	2.9%	1	2.9%	-	-
4	23	65.7%	22	62.9%	20	57.1%	18	52.9%
5	10	28.6%	10	28.6%	12	34.3%	15	44.1%
= 4 + 5		<b>94.3%</b>		<b>91.4%</b>		<b>91.4%</b>		<b>97.1%</b>
Total	35	100%	35	100%	35	100%	34	100%
Missing	-		-		-		1	
Total	35		35		35		35	



Table 14: Confidence frequency table

Item Number	46. When I first watched the VoP, I had the impression that the content would be easy for me.		58. As I used the VoP, I was confident that I could learn the content.		70. After using the VoP for a while, I was confident that I would be able to pass a test on the material.		80. The good organization of the content in the VoP helped me be confident that I would learn the material.	
Rating Scale	Fq	%	Fq	%	Fq	%	Fq	%
0	-	-	-	-	-	-	-	-
1	-	-	1	3%	1	2.9%	-	-
2	1	2.9%	-	-	-	-	1	2.9%
3	2	5.9%	1	2.9%	2	5.9%	-	-
4	20	58.8%	22	62.9%	20	58.8%	20	58.8%
5	11	32.4%	11	31.4%	11	32.4%	13	38.2%
= 4 + 5		<b>91.2%</b>		<b>94.3%</b>		<b>91.2%</b>		<b>97.1%</b>
Total	34	100%	35	100%	34	100%	34	100%
Missing	1		-		1		1	
Total	35		35		35		35	

Table 15: Satisfaction frequency table

Item Number	50. Completing the exercises in the VoP gave me a satisfying feeling of accomplishment.		66. I really enjoyed studying the material in the VoP.		77. It felt good to successfully use the VoP.		81. It was a pleasure to use such well-designed VoPs.	
Rating Scale	Fq	%	Fq	%	Fq	%	Fq	%
0	-	-	-	-	-	-	-	-
1	-	-	-	-	-	-	-	-
2	2	6.3%	1	3%	1	2.9%	2	5.7%
3	1	3.1%	-	-	-	-	1	2.9%
4	20	62.5%	23	65.7%	21	60.0%	19	54.3%
5	9	28.1%	11	31.4%	13	37.1%	13	37.1%
= 4 + 5		<b>90.6%</b>		<b>97.1%</b>		<b>97.1%</b>		<b>91.4%</b>
Total	32	100%	35	100%	35	100%	35	100%
Missing	3		-		-		-	
Total	35		35		35		35	

Frequency Table Key			
Likert-type scale ratings:			
0	Not applicable	3	Neither agree nor disagree
1	Strongly disagree	4	Agree
2	Disagree	5	Strongly agree
Fq.	Frequency		