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Caseley, Gavin B.

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THE ADOPTION DECISION OF TEXTBOOKS WITH SUPPLEMENTARY DIGITAL CONTENT BY SOUTH AFRICAN UNIVERSITIES

Gavin B. Caseley

A research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Business Administration

Johannesburg

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ABSTRACT

Higher education publishers increasingly invest in elaborate supplementary digital textbook packages in the competition for textbook adoptions. This supplementary digital content ranges from video demonstrations for instructors to online practice exercises for students. The research study was designed to examine how textbook adoption decisions are made at public universities in South Africa and the role played by supplementary digital textbook content in these textbook adoption decisions.

In-depth interviews were conducted with twenty-four faculty members responsible for making textbook adoption decisions at two public universities in Gauteng. It was found that the quality of textbook content was the single most important criterion currently applied in textbook adoption decisions followed by the cost of the textbook to students. Supplementary digital textbook content was not found to have an important influence on textbook adoption decisions for most faculties included in the study. The research did find, however, that supplementary digital textbook content can be expected to play an increasingly important role in textbook adoption decisions made at public universities in South Africa with implications for both faculty and higher education textbook publishers.

DECLARATION

I, Gavin B. Caseley, declare that this research report is my own, unaided work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the University of the Witwatersrand, Johannesburg. It has not previously been submitted for any degree or examination at this or any other university.

Signature

Gavin B. Caseley
November 2008

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1. INTRODUCTION

Although electronic textbooks did not take off to the extent that was predicted at the recent turn of the millennium, there is a growing trend towards the digitisation of pedagogic content employed at higher education institutions (Thompson 2005). This trend towards the use of pedagogic digital content is being facilitated by the adoption of course management systems at higher education institutions (McFall 2005), while the institutional use of pedagogic technology is seen as an important factor in the competition for students and university funding, especially in the United States (Appleton 2005).

At the same time that higher education institutions increase their use of digital content, higher education book publishers are seeing global pressure on the sales of printed textbooks. Some believe that traditional paper-based textbooks may be moving from the mature phase to the decline phase of their product life cycle (Kotler 2000; Etzel, Walker & Stanton 2001). As sales of textbooks decline in the United States, by far the biggest market for tertiary textbooks internationally, university educators increasingly look for more choice and flexibility in the course materials that they prescribe and which may or may not include traditional textbooks (Nelson 2006).

These are challenging times for higher education textbook publishers as sell-through rates of textbooks to students decline each year (Thompson 2005). A survey by the national Association of College Stores found that only 43% of students buy the required books for their courses (Clow, McConkey, Stevens, Prather and Topuz 2007). Consolidation within the higher education book publishing industry in recent years has intensified competition among the firms that remain and publishers look more and more to supplementary digital materials bundled with printed textbooks (1) to help differentiate their products in the textbook adoptions market and (2) to keep them relevant in an increasingly digital pedagogic content environment.

The bundling of supplementary digital content with textbooks is also effective in helping to undermine the second-hand textbook market. A textbook bundled with supplementary digital textbook content is usually supplied with a unique code for the purchaser to obtain access to this supplementary content supplied with the textbook. This access code is valid for a limited time period, usually for six months or a year, and once this time period for access to the online content has expired, the textbook becomes devalued as an item for resale.

There are a number of underlying benefits that are driving the trend towards the increased supply of digital pedagogic content by higher education book publishers:

- Digital content delivery reduces production and distribution costs for textbook publishers. Digital content eliminates the need for paper, printing, binding, sorting and the transportation of physical books for publishers, as well as the need to accept damaged or unsold stock returned by retailers. Unsold stock from retailers is often of little value to publishers because it is either (1) damaged stock or (2) has been replaced as the latest edition of the textbook.

- Digital content is easily updated. Online content can be updated regularly and at little cost relative to issuing new print editions of textbooks. This is especially valuable in subject areas where content frequently changes, such as political science or textbooks on economics.

- Digital content offers searchable depth and range. Digital content is scalable and can consist of large quantities of information with a depth and range not possible in most print formats. Since digital content is also searchable, large databases of information can be made more appealing to users if publishers include electronic methods of searching the published information.

- Digital content offers opportunities of expanded markets for publishers. Digital content can appeal to potentially bigger markets, both locally and

globally, since it is available anytime, anywhere and to multiple users at the same time.

- Digital content offers the benefit of richer content. Digital content can be supplemented with other media such as visual images, streaming video and sound clips in ways that enhance the richness and potential pedagogic value of the content for the user. Digital content therefore can offer additional value to users that are not available in printed format.

- Digital content offers the benefit of inter-textual referencing. The primary referencing tools with printed material are footnotes, endnotes and bibliographies. However, digital content offers the opportunity to use more dynamic referencing such as hypertext links to other digital content sources without the user having to physically locate the referenced texts. Links used can also be easily updated by publishers.

- Digital content delivery implies that publishers may be able to bypass intermediaries in the traditional book supply chain. Intermediaries such as book wholesalers, book distributors and book retailers may be cut out of the traditional book supply chain if higher education publishers are able to supply the content directly to the end user as a digital download.

- Digital content is increasingly a minimum requirement in the competition for textbook adoptions. Thompson (2005) argues that the motivation for higher education book publishers to include supplementary digital content with the printed textbook is less to enrich the educational experience of students but is rather driven by the *competitive dynamic of the adoption system* (Thompson 2005: 381). The investment by higher education book publishers in supplementary digital content platforms such as companion websites is no longer considered optional but has become a minimum requirement in competing for many large adoptions in the textbook adoptions market. Major publishers in the United States are increasingly developing printed and electronic materials in tandem to strengthen their

competitive position as the competition for textbook adoptions increasingly revolves around the quality and features of the supplementary digital content offered with the printed textbook (Thompson 2005).

Supplementary digital textbook content as a minimum requirement tends to apply more to major textbooks at lower, introductory levels of the curriculum that have high student enrolments and therefore high potential sales of the textbook once adopted. Examples here include introductory courses in subjects such as Economics, Mathematics and Psychology which have a high number of students enrolling at higher education institutions globally. The potential high sales of these textbooks help justify the ongoing investment made by publishers in developing the supplementary digital content that is bundled with the textbook when submitted for adoption.

The implication from this that supplementary digital textbook content increasingly serves as a barrier to entry for new publishers that wish to compete at lower levels of the curriculum but who cannot afford the required investment in developing digital content in addition to the development of printed content (Porter 1985; Thompson 2005). However, in the publishing of middle-range textbooks and textbooks for more advanced and post-graduate courses the offering of supplementary digital textbook content is less likely to be considered a minimum adoption requirement by faculty responsible for making textbook adoption decisions.

- Digital content is increasingly seen by publishers as future-proofing themselves against changing markets. For major textbook publishers the printed textbook remains the principal revenue generating mechanism for the firm and industry observers expect it to fulfil this function for the foreseeable future (Thompson 2005). If this proves to be the case, then the development of supplementary digital textbook content by publishers strengthens the competitive position of the publisher with digital content serving as a *sustaining* technology for textbook publishers (Bower and Christensen 1995).

However, there are indications that the traditional market for textbooks may be changing and that digital content may act as a *disruptive* technology for textbook publishers (Bower and Christensen 1995). If customer needs and technologies are changing significantly in the higher education book market then it is important that higher education publishers anticipate these industry changes and adapt their value offering as early as possible (Hamel and Prahalad 1994; Van der Heijden, Bradfield, Burt, and Cairns 2002; Watkins and Bazerman 2003).

1.1 Purpose of the study

The purpose of the research study was to examine the role of supplementary digital textbook content in textbook adoption decisions made at public universities in South Africa.

1.2 Context of the study

The printed textbook, while not completely replaced by digital content, is increasingly being sold as a package that combines both printed and digital content. Publishers are investing in elaborate supplementary digital textbook content packages in the competition for textbook adoptions (see Appendix A).

Supplementary digital textbook content bundled with textbooks first took the form of test files supplied on floppy discs, before evolving to include laser discs, videos, CD-ROMs and, with the growth of the internet, textbook companion websites. CD-ROMs tend to be used for larger audio and video files that may be expensive for faculty and students to download. Faculty sometimes specifically request CD-ROMs of video case studies from textbook publishers and there is an increasing supply of audio clips, such as recorded chapter summaries, that are bundled with textbooks with the audio format appealing to the growing sector of MP3 player student users (Daniels 2006).

Supplementary digital textbook content is moving increasingly online with the introduction of textbook companion websites and unique access codes included

with each textbook sold (see Appendix B). Web-based materials are now the most common form of electronic supplement (Thompson 2005). The online delivery of supplementary digital textbook content allows for content that can be regularly updated by publishers with links to online research studies and other websites publishing content relevant to the course. Essentially, purchasers of textbooks are gaining access to additional online content on a subscriber digital-rights-management model. Access is granted on payment of a special fee incorporated into the cost of the textbook with the textbook effectively becoming a portal to the content delivered online (Hilts 2003; Daniels 2006).

Should the evolution to pedagogic content that is delivered online continue, the point may well be reached where the physical, printed textbook becomes no more than a manual to guide instructors and students through the real resources which are published online (Gallagher 2002). While the future of the printed textbook may be unclear, what is certain is that the evolution to digital content in higher education book publishing will continue provided that faculty and students adopt these new emerging technologies (Nelson 2006).

1.3 Problem and sub-problems motivating the study

1.3.1 Main problem

The purpose of the research was to examine the role of supplementary digital textbook content in textbook adoption decisions made at public universities in South Africa.

1.3.2 Sub-problems

1. The first sub-problem was to establish which textbook adoption criteria are currently being applied in textbook adoption decisions made at public universities in South Africa.

2. The second sub-problem was to establish whether supplementary digital textbook content generally influences textbook adoption decisions made at public universities in South Africa.

3. The third sub-problem was to identify the categories of supplementary digital textbook content most valued by faculty members making textbook adoption decisions made at public universities in South Africa.

4. The fourth sub-problem was to identify the benefits from and barriers to the adoption of supplementary digital textbook content as perceived by faculty members making textbook adoption decisions at public universities in South Africa.

1.4 Significance of the study

The development and supply of supplementary digital textbook content by higher education book publishers is based on the assumption that this additional material is utilised - or at least valued - by faculty members and so positively influences their decision of which textbook to adopt. If this assumption is correct, then those higher education publishers that provide the most compelling supplementary digital textbook content will have a distinct advantage in the textbook adoptions market.

If, on the other hand, supplementary digital textbook content has little effect on the textbook adoption decision, then higher-education publishers are offering products that may be different but are not differentiated since buyers do not sufficiently value the supplementary digital textbook content included in the bundled textbook offering (Porter 1985). Higher education publishers may then be better served by diverting the investment made in supplementary digital textbook content into product features that have more value for faculty members responsible for making textbook adoption decisions.

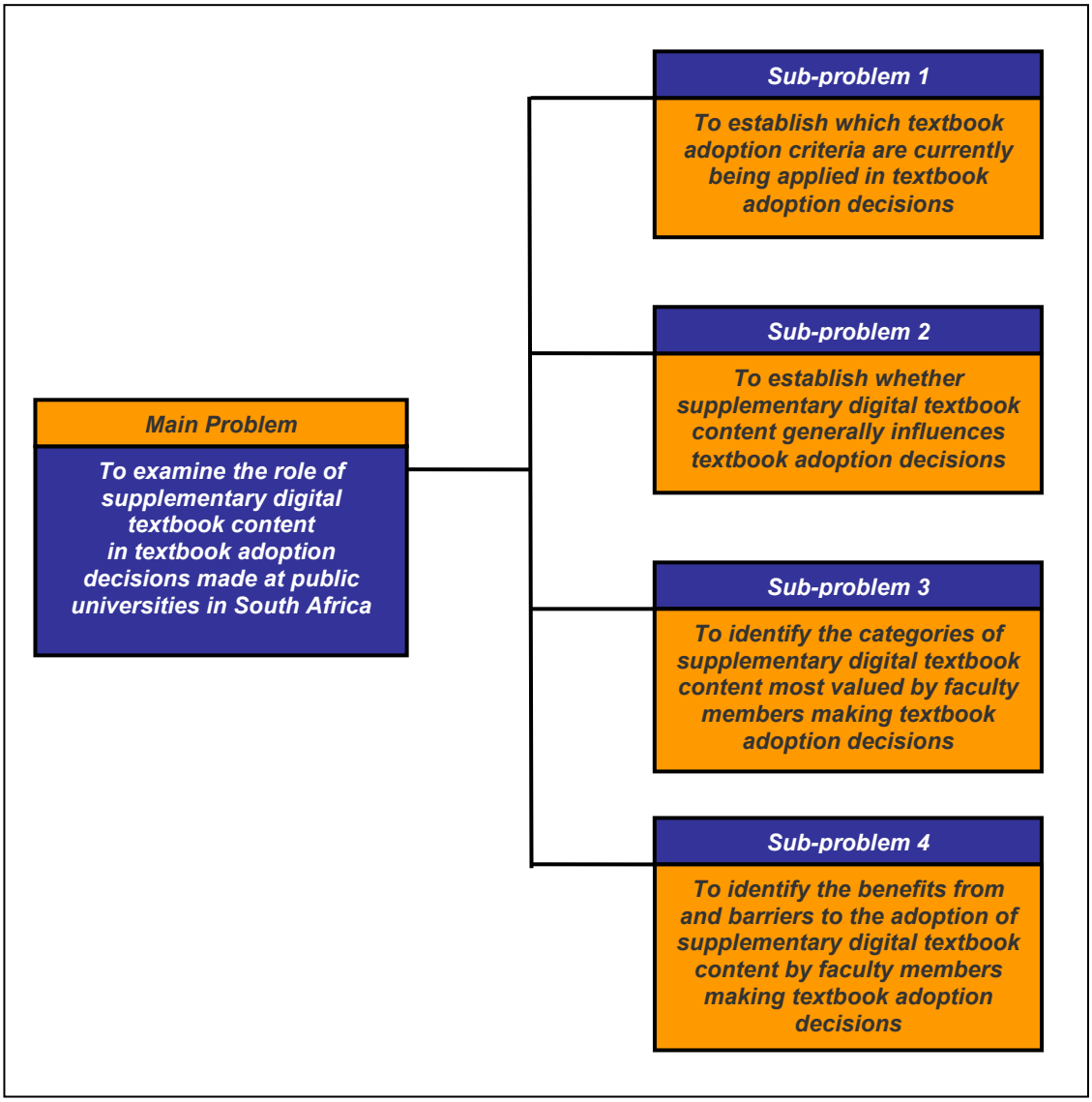


Figure 1. Main problem and sub-problems in the research study

This research study should be of value to the higher education book publishing industry in considering the fundamental question of whether supplementary digital textbook content influences textbook adoption decisions made at public universities in South Africa. By exploring the expectations of faculty members making the textbook adoption decision on the importance of digital pedagogic content in courses offered at their institutions, the study should also provide higher education publishers with additional understanding of how supplementary digital textbook content may be better employed to achieve differentiation in the textbook adoptions market in the future. Publishers currently spend a significant portion of the production cost of a textbook on

promotion with publishers continually seeking more effective ways to promote their textbooks (Clow *et al* 2007). A better understanding of the general textbook adoption criteria used by faculty members making textbook adoption decisions at South African public universities should also be valuable to publishers in developing more effective marketing and promotion strategy for textbooks submitted for adoption in the South African higher education market (Stevens, Clow, McConkey and Tiger 2007).

1.5 Delimitations

The trend to digital publishing in higher education has broad implications for the higher education book publishing industry. It is a trend that is still emerging and that has many important potential areas of impact for both higher education publishers and higher educational institutions. It was therefore important that the research study was contained and clearly delimited so that (1) the study remained of manageable scope given the time and resources available and (2) the study produced results that had a greater likelihood of being useful to organisations (Roth 1995; Leedy and Ormrod 2001).

1.5.1 The research study focused on textbook adoption decisions made at public universities in South Africa. The study did not extend to textbook adoption decisions made at private higher education institutions existing in South Africa.

1.5.2 The research study focused on the two public universities located in Johannesburg, Gauteng. The study did not extend to the twenty-one other public universities located in other parts of Gauteng and in other provinces in South Africa.

1.5.3 The research study used a qualitative research methodology that relied on the views as expressed by faculty members interviewed. Not all these interviewees could be expected to have been equally experienced, articulate or perceptive (Creswell 2003). The content analysis conducted

on the qualitative data generated from the interviews was similarly an inherently subjective process.

1.5.4 The research study focused on the attitudes to the adoption of supplementary digital content at public universities in South Africa from the viewpoint of faculty members that make textbook adoption decisions. The study did not consider the adoption of textbooks with supplementary digital textbook from the viewpoint of students at public universities in South Africa.

1.5.5 The research study did not consider the role that supplementary digital textbook content may play in textbook adoption decisions made in courses specifically developed for distance education. Textbook adoption decisions made at the University of South Africa (UNISA), for example, were not included in this research study.

1.6 Assumptions

The research study was conducted with the following underlying assumptions:

1.6.1 That the sample of faculty members interviewed would reflect normal perspectives and experiences.

1.6.2 That faculty members interviewed were making rational adoption decisions and would select textbooks that best served the educational interests of students.

1.6.3 That faculty members interviewed provided honest answers to the questions presented and from which the research data was drawn.

1.6.4 That faculty members interviewed were able to articulate their motives for the adoption or non-adoption of textbooks submitted for selection.

1.6.5 That the role played by supplementary digital textbook content in the textbook adoption process would be both distinct and identifiable.

1.7 Definition of terms

Supplementary digital textbook content is developed by higher education publishers for both instructors and students. For purposes of this research study the definition of supplementary digital textbook content was contained to the twelve categories of digital content specified in Appendix C.

2. LITERATURE REVIEW

2.1 The consumer adoption process

Many universities are facing challenges created by the diffusion of new technologies into the teaching and learning environment (Hall and Elliot 2003). A useful model for understanding the adoption of new and emerging technologies is the innovation adoption curve (Rogers 1976, 2003; Groves and Zemel 2000; Nelson 2006). The innovation adoption curve shows that new technologies are not adopted equally quickly by all ultimate users of the technology and that consumers can be classified by the time it takes them to adopt a new technology relative to other adopters (Blackwell, Miniard and Engel 2001). Instead, adoption occurs in stages with more risk-averse adopters becoming willing to try the new technology over time, as shown in Figure 2.

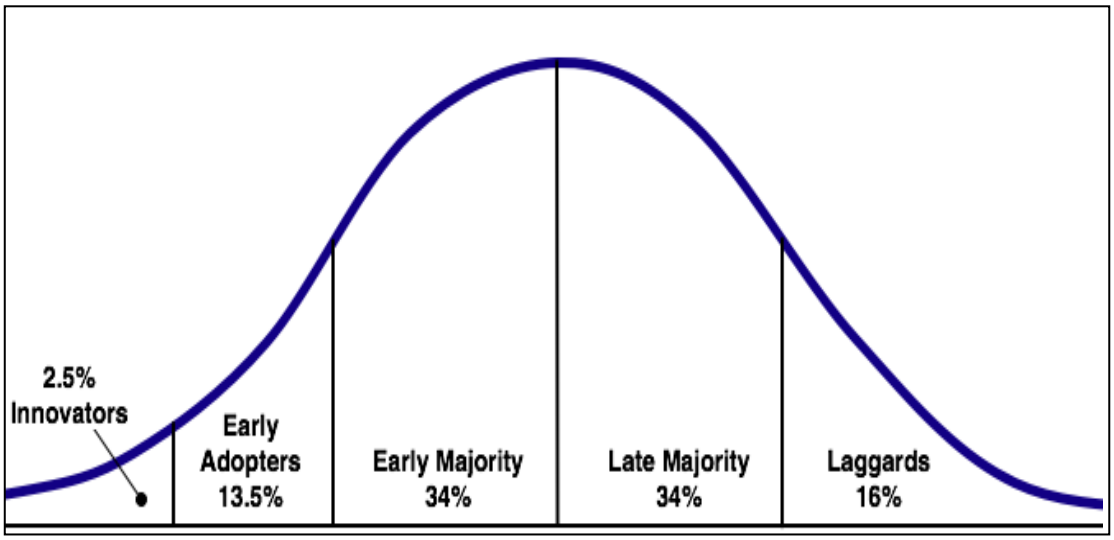


Figure 2. Adoption curve for innovations adapted from Rogers (2003)

The diffusion of an innovative technology is described in the model as an acceptance process for new products and services which tend to follow a normal distribution (Rogers 1976; Boone and Kurtz 1989). Some innovations require many years before they become widely adopted and a common problem for the innovator is often how best to speed up the rate of adoption (Rogers

2003). Few users tend to take up adoption of an innovation at first but the number of adopters increases rapidly as the value of the innovation becomes more widely recognised. The rate of adoption will then slow as fewer of the potential users of the new product remain. Since the categories identified are based on a normal distribution the size of each category is determined by standard deviations with non-adopters being excluded completely from the model (Rogers 1976, 2003). Roger's model has been criticised for this approach of using a normal distribution and standard deviations from the mean because this classification explains little of the characteristics of the adopters involved (Blythe 2008). However, Roger's classification of adoption categories is meant to provide *ideal-type* categories rather than descriptions of actual adopters (Rogers 2003). According to Rogers adopters can be classified into five ideal-type categories in terms of the innovativeness of their adoptive behaviour as a time-dependent phenomenon (Rogers 1976; Boone and Kurtz 1989; Adcock, Bradfield, Halborg and Ross 1993; Rogers 2003).

2.1.1 Innovators

Innovators tend to be pioneers in adopting new technologies and often push the use of the technology forward prior even to the development of standards. Innovators may be described as venturesome and willing to accept a setback when one occurs (Rogers 2003). Faculty members who are innovators tend to be intrigued by new technological developments and are largely able to learn how to use new technologies independently (Hall and Elliot 2003). A study by Medlin (2001) using Roger's innovation adoption curve categories found that faculty members who identified themselves as *innovators* were by far the largest users of new technologies in the classroom.

2.1.2 Early adopters

Early adopters tend to be opinion leaders that are open to new ideas (Rogers 1976). Early adopters tend to be more respected by their peers than innovators are and potential adopters often look to early adopters for advice on new

innovations (Rogers 2003). Faculty members who are early adopters tend to combine their technological competence with a desire to integrate new technologies into the classroom and into the teaching process (Hall and Elliot 2003).

2.1.3 Early majority adopters

Early majority adopters adopt new ideas just before average adopters do (Rogers 2003). Early majority adopters typically constitute 34% of ultimate users of a new technology, one of the two largest adoption categories in the model. These adopters tend to be more risk-averse than early adopters are but are more willing to experiment with new technologies and to accept technological change than the average person is (Rogers 1976; Nelson 2006). Early majority adopters may deliberate for some time before fully adopting a new technology and their *innovation-decision period is relatively longer than that of the innovators and early adopters* (Rogers 2003: 284). Faculty members who are early majority adopters tend to be receptive to adopting a new technology but only after the technology has been demonstrated to improve faculty teaching performance or to enhance student learning (Hall and Elliot 2003).

2.1.4 Late majority adopters

Late majority adopters will employ an innovative technology only after most others have already done so (Rogers 1976). Their reasons for adoption are often economic necessity or the result of increasing peer pressures and most of the uncertainty about a new idea must first be removed before the late majority will feel that it is safe to adopt (Rogers 2003). Faculty members in this adoption group tend to be sceptical of new technologies and must often be coerced into using new technologies in the classroom (Hall and Elliot 2003).

2.1.5 Laggards

Laggards make up 16% of all ultimate users of a new technology. These adopters tend to deliberately avoid new technologies (Rogers 1976) and have been described as *almost isolates* in their social systems (Rogers 2003: 284). Faculty members who are laggards tend to hold on to traditional approaches to teaching unless they have absolutely no alternative but to adopt a new technology in their instruction (Hall and Elliot 2003).

While no set of general or reliable indicators of innovativeness has emerged from research into adoptive behaviour there are some research findings that innovators tend to be younger and better educated (Adcock *et al* 1993). Nelson (2006) argues that students are more likely to be innovators or early adopters of new technologies than is the general population and, if a new technology is not adopted by students, there may be fundamental technical or organisational barriers to the adoption of the technology (Nelson 2006).

2.2 Rates of adoption

Not all innovations are adopted at the same rate and the rate of adoption of an innovation is determined by five of its inherent characteristics (Boone and Kurtz 1989; Hall and Elliot 2003; Rogers 2003).

2.2.1 Relative advantage

Relative advantage is the degree to which the innovation appears to the potential adopter as superior over similar previous products. What is important here is the *perception* of relative advantage by potential adopters rather than *objective* advantage (Rogers 2003). Relative advantage is usually considered by the user in terms of lower price, physical improvements or ease-of-use (Boone and Kurtz 1989). To speed up the rate of adoption of supplementary digital content by faculty members higher education publishers need to

effectively communicate the relative advantages and benefits of textbooks with supplementary digital content over traditional print-only textbooks.

2.2.2 Compatibility

Compatibility is the degree to which an innovation is consistent with the existing values, past experiences and needs of potential adopters (Boone and Kurtz 1989; Rogers 2003). As educators, faculty members can be expected to value improving the education and learning experience of their students and, provided that supplementary digital textbook content is perceived by faculty members to help achieve better learning by students, this compatibility should facilitate the adoption of supplementary digital content supplied with textbooks.

2.2.3 Complexity

Complexity is the degree to which an innovation is perceived as difficult to understand and use (Rogers 2003). The more difficult the innovation is for potential users to understand, the slower the expected rate of adoption will be (Boone and Kurtz 1989). The greater the perceived ease-of-use of the supplementary digital textbook content the greater the likelihood of faculty members trying the technology in the classroom or prescribing it for students and potentially adopting it. Education and training by higher education book publishers of faculty members in the use of supplementary digital textbook content could play a role in supporting the adoption of the supplementary textbook content by reducing the perceived complexity of the innovation for faculty members.

2.2.4 Divisibility

Divisibility refers to the ability to trial the innovation on a limited basis with minimal financial or other attached risks (Rogers 2003). The more divisible an innovation is the greater the potential rate of adoption of the innovation (Boone and Kurtz 1989). Higher education publishers regularly supply sample copies of

textbooks to faculty members for evaluation in making textbook adoption decisions. Supplementary digital content bundled with textbooks would be included with sample copies supplied for evaluation by faculty members.

2.2.5 Observability and communicability

Communicability refers to the degree to which an innovation's benefits and superiority over earlier technologies can be observed, demonstrated and communicated to potential users. The easier it is for individuals to see the results of an innovation the more likely they are to adopt it (Rogers 2003). Similarly, the greater the communicability inherent in an innovation, the greater the potential for a faster rate of adoption of the innovation (Boone and Kurtz 1989). Publishers' sales representatives can enhance the adoption of supplementary digital textbook content by actively demonstrating to faculty members the advantages in teaching and learning from using the supplementary digital textbook content in their courses.

2.3 Textbook adoption decisions

A textbook has been defined as *a book which is written for and used by teachers and students for the purposes of teaching and learning* (Thompson 2005: 196). Textbooks generally play an essential role for students in obtaining a higher education with the textbook and its ancillaries forming an integral component in the higher education process (Rosenfeld 2006; Stevens *et al* 2007; Clow *et al* 2007). The textbook adoption process is the primary means faculty have to ensure that they have access to well-designed instructional materials (Stein, Steun, Carnine and Long 2001). It has been estimated that textbooks constitute 75% to 90% of classroom instruction on higher education courses (Tyson and Woodward 1989; Stevens *et al* 2007).

2.3.1 Importance of textbook adoption decisions

The importance of faculty members selecting an appropriate textbook for courses taught at higher education institutions is recognised in the literature (Quereshi and Zulli 1975; Chatman and Goetz 1985; Sommer, Estabrook and Horobin 1988; Ade-Ridder 1989; Griggs 1999; Stein *et al* 2001; Clow *et al* 2007; Stevens *et al* 2007). Some of the reasons given in the literature for the importance of faculty selecting the right textbook include the effect that the decision has on student attitudes to both the course and the instructor (Stang 1975); that the textbook may in some cases be the only book the student ever reads (Muther 1985); that selection of the right textbook can reduce the time and effort required for faculty to design and coordinate other instructional materials and activities used on the course (Chatman and Goetz 1985); and that the textbook is often the only learning tool available to students apart from the classroom experience (Ade-Ridder 1989). With more and more textbooks becoming available to faculty members correct textbook selection by them is becoming increasingly important (Stang 1975; Griggs 1999). Informed textbook selection is considered especially important for introductory university courses which often have large student enrollments and where textbooks need to provide a vital theoretical foundation for students new to the discipline (Griggs 1999; Stevens *et al* 2007).

2.3.2 Complexity of textbook adoption decisions

The textbook adoption decision is often a time-consuming and complex process (Altman *et al* 2006). Textbook selection is has become more difficult with the increase in both the quality and quantity of textbooks available (Stang 1975). While there is anecdotal evidence that provides information as to textbook selection criteria used by faculty members, limited empirical research is available on how textbook adoption decisions are actually made at higher education public institutions (Smith and De Ridder 1997; Stein *et al* 2001; Clow *et al* 2007).

Morris (1977) describes the process by which textbooks are adopted as far from ideal and Chatman and Goetz (1985) have called for more systematic, comprehensive and reliable methods of textbook selection, such as content assessment methods, which are more responsive to learner characteristics and course objectives. However, a study by Landrum and Hormel (2002) found that the most common process of textbook selection was individual instructor selection (64.5%) while the next most common was by committee vote or consensus (30.8%). This implies that more systematic and comprehensive assessments of textbooks would be hard to enforce on individual faculty decision makers.

The variety of textbooks prescribed for similar courses across many higher education institutions indicates that there are clearly different opinions among faculty members of what constitutes the best textbook for a particular course (Smith and De Ridder 1997). The textbook adoption decision is often based on intuition, familiarity with known publishers and personal preferences by faculty members making the textbook adoption decision.

> "Unavoidably, decisions about which texts to adopt hinge, in part, on impressions gleaned from advertisements, discussions with colleagues, and superficial glances through potential texts." (Weiten 1988: 10).

The textbook selection process is further complicated by the instructor's consideration of textbook attributes, publisher practices, as well as the instructor's experience of teaching the course (Landrum and Hormel 2002). Systematic standards and procedures are seldom applied (Chatman and Goetz 1985) and Morris (1977) has questioned the ethical basis on which some textbook adoption decisions are made. Insufficient time is generally allocated to the process (Morris 1977; Stein *et al* 2001) and sufficient information is often unavailable to faculty members making the adoption decision, although this is being reduced by increased information being made available by publishers on the internet. In the study by Clow *et al* (2007), 42.8% of faculty members

surveyed indicated that they always access the publisher's website when reviewing a textbook in the textbook adoption process.

2.3.3 Variability of textbooks submitted for adoption

Some observers believe that the textbook adoption decision should be becoming less complex because textbooks are increasingly similar to each other. This trend is described as due to textbook adoption market dynamics driving growing conformance in textbook content (Durwin and Sherman 2008). As higher education book publishers strive to produce textbooks that appeal to as broad a market as possible, the result is bigger, more comprehensive textbooks that cover multiple topics in a bid to match course syllabuses taught at as wide a range of higher education institutions as possible (Thompson 2005). Textbooks are likely to become even more similar in content and format as the fewer publishers remaining in the industry compete for the same adoptions and as publishers model their own publications on the structure and content of market-leading textbooks (Cush and Buskist 1997). Authors may be discouraged from producing content that is potentially controversial or idiosyncratic and which may alienate potential textbook-adopting faculty members (Thompson 2005). A study by Quereshi (1993) found that newer textbooks had become more similar to each other than the researcher had found in previous studies using content analysis of introductory psychology textbooks adopted at universities in the United States.

However, other empirical studies in the literature do not support the view of reducing variability between textbooks. A study by Chatman and Goetz (1985) found that there was a great deal of variability among introductory educational psychology textbooks. Altman *et al* (2006) found that the perceived similarity between textbooks was based more on presented chapter topics and content organisation than on the actual content provided within each chapter. Textbooks also varied greatly on several dimensions including core concepts and key terms, the level of difficulty, the promotion of critical thinking and the inclusion of supplementary pedagogical aids such as end-of-chapter review exercises

and student learning self-assessments (Griggs and Marek 2001; Altman *et al* 2006). A study of textbook glossaries conducted by Griggs, Bujak-Johnson and Proctor (2004) confirmed earlier research by Zechmeister and Zechmeister (2000) that introductory psychology textbooks do not share a very large common core vocabulary, while Drake (2007) found that there is real variation between textbooks in terms of writing style, approaches to theory and techniques adopted within the text. A study by Griggs and Marek (2001) specifically found strong variation across introductory texts in the supplementary digital content supplied with the textbooks used in the study.

2.3.4 Adopted textbooks and student learning

The literature is divided on the extent to which the choice of prescribed textbook influences student learning. The impact of the textbook on student's learning has been described by Morris (1977) as *critical and what ultimately determines* [the textbook's] *worth* (Morris 1977:22); McKeachie (1976) believes that the textbook, more than any other element of the academic course, determines student learning; while Griggs (1999) argues that research on teaching suggests that the textbook selected is the major influence on what students learn and not the teaching method applied.

However, some recent studies in the literature have provided conflicting results on this issue. Durwin and Sherman (2008) found that there is little empirical evidence available on whether the choice of textbook impacts differently on student learning. A study by Podolefsky and Finkelstein (2006) found that there is little correlation evident between student textbook reading habits and course grades achieved. While the selection of the textbook may be important for a number of important reasons, the relationship between textbooks and student learning is not necessarily one of them. The authors concluded that the relationship between textbook adopted by faculty and the student learning that results from this selection is best described as complex (Podolefsky and Finkelstein 2006).

2.3.5 Usage by students of adopted textbooks

A study by Sikorski, Rich, Saville, Buskist, Drogan and Davis (2002) found that despite many college and university courses being typically organised around a prescribed textbook, most students who purchased introductory textbooks used them infrequently and spent less than three hours per week reading these textbooks. The students in the study believed that studying class notes and attending lectures were more effective in obtaining good course grades than time spent studying the textbook. The study also found that, if instructors wished to increase the use of textbooks by students, that they needed to structure their courses *in ways that promote frequent and critical reading of the textbook* (Sikorski *et al* 2002: 313).

Podolefsky and Finkelstein (2006) found that students use their textbooks in different ways. Some students tend to rely primarily on the textbook in preparing for their examinations while other students tend to rely more on lecture notes in their studies, using the textbook primarily for completing homework assignments or for help in understanding the content presented in lectures. Most students will only read the sections of the textbook specifically prescribed by the instructor while other students may choose to read sections of the textbook that are not prescribed out of personal interest.

2.3.6 Changing of adopted textbooks

Introductory textbooks are typically revised on a three-year schedule and generally stay on the adoptions market for approximately ten years (Cush and Buskist 1997). Faculty changing prescribed textbooks typically every three years is supported by two recent studies: just under 40% of faculty responding to a survey by Stevens *et al* (2007) stated that they changed textbooks approximately every three years while a study of finance faculty conducted by Clow *et al* (2007) found that 44.8% of respondents reported changing textbooks approximately every three years.

The most important reasons for changing textbooks given in the study by Stevens *et al* (2007) were (1) better content in the new textbook (2) the new textbook being better suited to faculty's teaching style and (3) faculty were unhappy with the current textbook and wanted a change in textbook. The three primary reasons given for changing textbooks in the Clow *et al* (2007) study were similar: (1) better content in the new textbook (2) faculty were unhappy with the current textbook and (3) the new textbook was better suited to the respondent's teaching style. These results are illustrated in Table 1.

Table 1. Reasons given by faculty members for changing adopted textbooks

REASON FOR CHANGE	PERCENTAGE
Better content of new textbook	64.1%
Unhappy with current textbook	61.4%
New textbook better suited to my teaching style	51.7%
New edition of current text out	46.2%
Dissatisfied with ancillary materials	29.7%
Better ancillary materials with new textbook	29.7%
Unhappy with the publisher	9.7%

Source: Clow, McConkey, Stevens, Prather and Topuz 2007

Better supplementary digital content offered with the new textbook (31.7%) or dissatisfaction with current textbook ancillary materials (29.4%) were less frequently a reason given for changing textbooks in the Stevens *et al* (2007) study. In the Clow *et al* (2007) study 27.9% of respondents provided '*better ancillary materials with new text*' as their reason for their changing the prescribed textbook.

2.4 Criteria used in textbook adoption decisions

A number of studies exist in the literature to determine which textbook adoption criteria are most important to faculty members making textbook adoption decisions.

Durwin and Sherman (2008) showed that student preferences should be considered an important textbook adoption criterion. This view supported the importance of an earlier study by Stang (1975) that found that the five most important criteria to students in their evaluation of textbooks were: (1) interest; (2) balance; (3) depth; (4) learning aids and (5) level of reading difficulty.

In a study of textbook adoption criteria used in the United States, Muther (1984) identified the six most important textbook adoption criteria as: (1) visual appeal; (2) durability; (3) currency of content; (4) suggestions for instructors; (5) ease-of-use, with simple, clear guides for students and teachers; and (6) the credibility of the author(s). Durability has become arguably less important as a selection criterion since 1984 because of minimum durability standards that have become required of textbook publishers.

A 1997 study by Smith and De Ridder found that accounting faculty placed the most value on comprehensibility, understandability and readability of textbooks for students in selecting textbooks for adoption. The relevance of the textbook content was ranked second and textbook graphics ranked seventh in importance as selection criteria, while ancillary support materials such as student tutorials, student study guides, instructor teaching guides, instructor teaching videos, and computerised practice tests were ranked tenth or more in the list of textbook adoption criteria (Smith and De Ridder 1997).

Altman *et al* (2006) identified five textbook selection criteria that were considered most important by faculty responding to the survey.

1. *Content*: Content in the study included the right topics covered; depth of content in topics covered; rigor applied in content; diversity in content.

2. *Pedagogy*: Pedagogy in the study included layout; writing style; appropriateness for student learning styles; student comprehension; relationship of visual elements to the text.

3. *Student ancillaries*: Student ancillaries included printed and online practice-tests; CD-ROMs; companion websites.

4. *Instructor ancillaries*: Instructor ancillaries included instructor manuals; test banks; videos; audio files; companion websites.

5. *Support of publisher representative*: This referred to the supportiveness of publisher representatives for faculty members before and after the textbook adoption decision.

A large 2007 survey of 1398 faculty members in the United States found that content; appropriate ancillary materials; edition of the textbook and the cost of the textbook to students were the four primary criteria used in textbook adoption decisions made by the faculty members surveyed (Stevens *et al* 2007).

In a second 2007 study by Clow *et al* of the textbook adoption process for finance textbooks found that content was the single most important criterion used in selecting a textbook: 95.9% of respondents indicated that this criterion was either important or very important. Only 2.8% of respondents stated that content was not important in the textbook selection process. The second most important criterion identified in the Clow *et al* (2007) study was ancillary materials supplied with the textbook. The third criterion identified was edition of the textbook, with higher editions indicating to potential adopters that the book

was likely to have been more editorially refined and more widely accepted that lower editions of alternative textbooks. The cost of the textbook for students ranked as fourth most important in this study (Clow *et al* 2007). In the 1997 Smith and De Ridder study cost ranked ninth in importance suggesting that the cost of textbooks to students had possibly become more important in textbook adoption decisions made by faculty members.

2.4.1 Textbook content

The importance of textbook content as a key textbook adoption criterion is widely supported by empirical studies conducted in the literature (Muther 1984; Smith and De Ridder 1997; Smith and Muller 1998; Altman, Ericksen and Pena-Shaff 2006; Stevens *et al* 2007; Clow *et al* 2007). One of the most important considerations in selection of a textbook by faculty is that it presents content consistent with the goals set for the course (Morris 1977). The textbook content must both cover the scope of the content to be included in the course as well as support the course learning objectives.

Some studies have also identified the importance to faculty members of textbook content being current (Muther 1984; Smith and De Ridder 1997; Smith and Muller 1998). A study by Landrum and Hormel (2002) found that the most frequent response (14%) to what instructors wanted to see added to introductory textbooks was material that related more to *current issues* (Landrum and Hormel 2002: 248).

2.4.2 Textbook readability

Readability has been described is one of the most important factors to consider in the selection of a textbook (Sommer 1980; Quereshi 1981; Smith and De Ridder 1997; Dake 2007; Durwin and Sherman 2008). A study of marketing textbook selection practices by Smith and Muller (1998) found that there was almost universal agreement among faculty surveyed that student ability to comprehend textbook material was of paramount importance to textbook

selection, followed by the relevance of the textbook's content. Some of the studies in the literature argue that because of its importance readability should be considered as an independent criterion to be evaluated in textbook adoption decisions (Spinks and Wells 1993; Durwin and Sherman 2008).

Students themselves are often good judges of the readability of textbooks (Durwin and Sherman 2008) and when students evaluated textbooks in one research study they ranked readability as a more important selection criterion than the extent or depth of the textbook's content (Landrum and Hormel 2002). In the study by Stang (1975) one of the five most important criteria for students in evaluating textbooks was the level of reading difficulty inherent in the textbook. Sommer (1980) has suggested that pre-publication student evaluations of textbooks could help improve comprehensibility for students in the published textbooks.

While the trend has been for newer textbooks to be more readable than textbooks published in previous years (Quereshi 1993), assessing readability of a textbook should not be reduced to simplistic readability formulas, which has tended to be the case (Muther 1985). Publishers, anticipating the use of readability formulas in textbook evaluations at higher education institutions, have increasingly published textbooks with shortened sentences and reduced vocabulary which may have the ironic negative effect of obscured meaning for students. In assessing readability faculty should rather review the *quality* of writing in a textbook which is more important than testing the text against readability rules which may be simplistic (Tyson and Woodward 1989).

Linked to the readability of textbooks for students is the need to match the academic rigour of the textbook being evaluated and the academic level of the course for which it is to be prescribed. The instructor must consider both the knowledge level of the student and the intrinsic academic level of the course. However, matching the level of textbook difficulty with student ability is not an easy task and the depth of content, breadth of content and how rigorous the

treatment of the content is must all be considered in the textbook adoption decision (Griggs 1999; Durwin and Sherman 2008).

2.4.3 Cost of the textbook to students

The cost of textbooks to students directly affects the quality and affordability of higher education. From studies in the literature it is clear that there is growing concern about the escalating cost of textbooks for students (Sommer 1980; Quereshi 1981; Sommer, Estabrook and Horobin 1988; Griggs, Jackson and Marek 2002; Fairchild 2004; Rube 2005; Thompson 2005; Rosenfeld 2006; Case 2006; Clow *et al* 2007; Stevens *et al* 2007). Faculty members increasingly support changes that will result in lower costs of textbooks to students (Fairchild 2004) and students have been found to be especially concerned with the rising price of textbooks (Sommer 1980; Thompson 2005; Drake 2007).

Since the mid-1990s textbook prices in the United States have increased at 6% per annum. This is twice the annual inflation rate and significantly more than the growth in prices of other book products in the United States (Griggs *et al* 2002; Fairchild 2004; Rube 2005; Clow *et al* 2007). A 2003 study by the California Student Public Interest Research Group (CALPIRG) into higher education publisher practices found that between 1997 and 2003 textbook costs for students had increased by as much as 24% (Fairchild 2004). A separate study found that between 1994 and 2005 the wholesale prices of textbooks in the United States increased by as much as 62%. In comparison, prices charged for all finished goods increased by only 14% and prices charged by publishers for general books increased by 19% over the same period (Rube 2005).

In the United States students now spend an average of $700 - $1000 per year on college textbooks (Holland 2008). The cost of textbooks as a percentage of tuition fees in this, the biggest market for higher education textbooks globally, is now as much as 26% for a full-time student attending a four-year public institution; and 72% for a full-time student attending a two-year public institution (Rosenfeld 2006). With the majority of university textbooks that are sold in

South Africa being imported from the United States, the rising cost of textbooks in the United States directly affects the price of textbooks sold in South Africa. In a research study completed by Yellowwood in October 2008, South African students interviewed reported spending as much as R4000 to R5000 per annum on textbooks (Robinson 2008). This is despite the availability of International Student Editions of North American textbooks which are sold at lower prices in many countries around the world, including South Africa.

In response to these increasing prices many students are turning to borrowing, sharing or copying new textbooks, as well as purchasing second hand textbooks where they become available. A survey by the National Association of College Stores in the United States found that only 43% of students buy the textbook prescribed for their courses (Nelson 2006). A study by Sikorski *et al* (2002) found that 21% of students who did not buy the prescribed textbook reported doing so because the textbook was 'too expensive', while 43% of students in a July 2004 survey in the United States said that they had chosen not to purchase textbooks prescribed for at least one course in order to save on overall tuition costs (Rube 2005). In a 2008 study of the South African textbook market local students interviewed at three public universities in Gauteng (University of the Witwatersrand; University of Johannesburg; University of Pretoria) indicated that they often resorted to making copies of relevant sections of prescribed textbooks from copies purchased by friends or made available in libraries. This was due to the increased cost of new textbooks (Robinson 2008).

The textbook market has been described in the literature as an anomaly or 'broken market' in that the party that selects the textbooks to be purchased is not the same party making the purchase (Sommer *et al* 1988; Rosenfeld 2006; Allen 2007). Students are largely a captive market and are expected to buy the specific textbooks that course instructors indicate are required for the course (Thompson 2005). If faculty members making textbook adoption decisions do not use price as a primary selection criterion or if they lack accurate price information at the time of making the adoption, then textbook publishers will be less inclined to compete with other publishers on price, a market dynamic that

may have directly contributed to higher education having become one of the most profitable areas of book publishing (Rosenfeld 2006; Sommer *et al* 1988). It is argued that higher education publishers sometimes take advantage of this market anomaly by deliberately de-emphasising price as an important textbook selection criterion for faculty members (Sommer *et al* 1988; Case 2006). In the CALPRIG study as much as 77% of faculty members surveyed reported that publishers rarely or never present the price of the textbook in sales presentations to faculty members (Allen 2007).

Quereshi (1981) argues that a higher price for a textbook is not an indicator of quality of content supplied in the book but rather of its bulkiness and design. To encourage faculty members to consider the cost of the textbook as an important textbook selection criterion Rube (2005) and Rosenfeld (2006) argue that:

1. Faculty members should be made aware by their institutions of how their choice of textbook affects students financially;

2. Textbook prices should be made clear to faculty members early in the textbook selection process and before the adoption decision is made;

3. Publishers' representatives should be required when submitting books for adoption to supply faculty members with full information on textbook pricing and any substantive content differences between new and previous editions of the textbook.

Textbook price information becomes especially significant as the quality difference between textbooks competing for adoption diminishes (Sommer *et al* 1988). Faculty should clearly give preference to the lowest-cost textbook option when the educational content provided by textbooks competing for an adoption is largely equal (Fairchild 2004; Rube 2005; Case 2006).

A publishing strategy employed by textbook publishers that is often blamed for contributing directly to increased textbook prices is the frequent publishing of

new editions of textbooks to combat the used textbook market (Fairchild 2003; Rube 2005; Stevens *et al* 2007). Publishers typically issue new editions of successful textbooks every three years (33%) or four years (43%). These new editions cost between 45% - 58% more than used copies of older editions do (Fairchild 2004; Rube 2005) and, on average, 12% more than previous editions of the book (Rube 2005). Many faculty members believe that new editions of textbooks are published too frequently by higher education publishers. As much as 40% of faculty members surveyed in 2004, for example, believed that new editions of textbooks are "rarely" or "never" justified (Fairchild 2004). New editions of textbooks often include new illustrations, examples, problems and revised pagination, effectively reducing the value to students of previous editions available on the second-hand textbook market. Interestingly, Sommer *et al* (1988) found that the used textbook market itself contributes to higher new textbook prices since publishers need to recover their publishing investment sooner as new editions of the textbook will be sold in smaller quantities once the first academic year from publication is completed and second-hand copies become available.

Researchers also argue that cost of textbooks is being driven up by the publishing strategy of including supplementary digital content with textbooks (Fairchild 2004; Rube 2005; Rosenfeld 2006; Case 2006; Clow *et al* 2007). Supplementary digital textbook content has development, production and often online distribution costs, all of which need to be recovered in the purchase price of the bundled textbook product. The result is higher production costs for the textbook and higher retail textbook prices to students (Rosenfeld 2006; Clow *et al* 2007). Publishers typically include supplementary digital content with textbooks to help differentiate the textbook in an increasingly competitive market (Porter 1985; Thompson 2005) and to counter the resale value of the textbook on the second-hand market (Clow *et al* 2007). The used textbook market is undermined through the inclusion of supplementary digital content with textbooks because of user or time restricted access controls attached to the digital content, such as single-user passwords for access to companion websites, which reduce the resale value of the textbook package (Case 2006).

A study by Fairchild (2004) found that:

1. Nearly half of all textbooks surveyed came bundled with supplementary digital content in 2003.

2. The practice of publishers supplying supplementary digital content with textbooks increased by 21% between sequential editions in the study.

3. The number of items included in the supplementary digital textbook content offered increased by almost 50% between sequential editions in the study.

4. Textbooks for disciplines such as science or mathematics tended to carry supplementary digital content (66% of textbooks surveyed) more often than textbooks for the liberal arts (25% of textbooks surveyed), while books for business courses included supplementary digital textbook content in 50% of cases.

5. That 65% of faculty claim to 'never" or "rarely" use the supplementary digital content in their teaching or prescribe it for their students. Only 24% of faculty reported that they "always" or "usually" use the supplementary digital textbook content while 11% reported using supplementary digital textbook content "half the time" (Fairchild 2004).

Some research studies argue that higher education book publishers should be required to offer both bundled and unbundled versions of textbooks to give students the option of paying less for the paper-only version of the book (Fairchild 2004; Rube 2005; Rosenfeld 2006; Case 2006). While publishers have begun offering bundled and unbundled textbook options to some extent, more than half (55%) of the bundled books are not available to students as unbundled versions (Rube 2005). In cases where publishers have offered unbundled versions of the textbook, the textbook with supplementary digital textbook content is, on average, 10% more expensive than the unbundled version (Rube 2005). Since the difference in price between bundled and

unbundled versions of the same textbook can be as high as 48%, researchers suggest that publishers should also be required to disclose to faculty members the cost of both the bundled and unbundled editions of textbooks submitted for adoption (Rube 2005; Case 2006).

2.4.4 Illustrations and examples

The inclusion of good graphics and well-presented illustrations in textbook content plays a direct influence in textbook adoption decisions (Muther 1984). Faculty review the illustrations and examples included in the text as important components in how new theory and concepts are presented to students. For this reason some publishers deliberately place their best illustrations on right-hand pages of the textbook because they have found that faculty members conducting quick reviews of textbooks tend to hold the book in the right hand and thumb through it with the left hand (Muther 1984). The use of colour in textbook graphics and illustrations is important to the overall impression of the textbook created for faculty and students, although the inclusion of one or more colours adds considerably to the production costs of printed textbooks. Textbook illustrations and examples were found to be important to students in the 2008 Yellowwood study of the textbook market in South Africa, with one respondent stating this was one of the reasons that she used textbooks over other resources: “I study from textbooks because there are examples, problems and solutions” (Robinson 2008).

Worked examples included in the textbook are also very important in textbook selection, especially in the sciences where students are required to complete calculations and derive solutions to quantitative problems. Worked examples and solved problems provided by textbooks should reflect the most recent practice and research findings in the field and be relevant to the learning objectives of the course (Morris 1977; Smith and Muller 1998; Landrum and Hormel 2002).

2.4.5 Supplementary digital textbook content

The literature indicates that supplementary digital textbook content is growing in importance as a criterion in textbook adoption decisions. In a 1997 study by Smith and De Ridder ancillary support materials (defined as student tutorials, student study guides, instructor teaching guides, instructor teaching videos, and computerised practice tests) were ranked tenth in the list of textbook adoption criteria provided to respondents. In the study of textbook selection criteria by Altman *et al* (2006) ancillary materials (defined as practice tests, instructor manuals, test banks, videos, audio files and companion websites) were ranked fourth in importance by students and fifth in importance by faculty members in textbook selection decisions. A more recent study of faculty members by Clow *et al* (2007) ranked ancillary materials the second most important selection criterion while 27.9% of faculty members considered "*better ancillary materials with new text"* as the reason for their changing textbooks (Clow *et al* 2007). This study was supported by a second survey of faculty members by Stevens *et al* (2007) where appropriate ancillary materials were placed second only to content as an important textbook selection criterion. The implication from the results of these studies is that between 1997 and 2007 both digital and other supplementary textbook materials have become increasingly important in textbook adoption decisions made by higher education faculty members.

2.4.6 Teaching style of the instructor

Morris (1977) asserts that choosing a textbook cannot be considered independently of instructor characteristics and teaching format. In recent studies conducted by Stevens *et al* (2007) and Clow *et al* (2007) one of the top three reasons provided by faculty members for changing textbooks was that the new textbook better suited the respondent's teaching style. With textbooks forming an integral component of the higher education process (Rosenfeld 2006) and textbooks constituting 75% to 90% of classroom instruction on higher education courses (Tyson and Woodward 1989; Stevens *et al* 2007), how the instructor prefers to present the course material in the classroom will directly influence

choices made on textbook adoption for the course. The textbook selected effects student attitudes to both the course and the instructor (Stang 1975) and the selection of the right textbook can also reduce the time required for faculty to design and coordinate other instructional materials used on the course (Chatman and Goetz 1985). On many courses the textbook is the primary learning tool available to students apart from the classroom experience (Ade-Ridder 1989) making it understandable that many faculty members consider it important to select a textbook that compliments and supports the teaching style and approach adopted in the lecture room.

2.4.7 Ongoing support from publishers

In the study by Medlin (2001) ongoing support from the publisher was seen as essential in the adoption of new technologies in teaching and learning at higher education institutions. The later study by Altman *et al* (2006) identified *support of publisher representative* as one of the five most important textbook adoption criteria for faculty members. In a study by Clow *et al* (2007) one of the reasons that 9.7 % of faculty members gave for changing a textbook once adopted was discontent with the publisher of the current textbook. Clearly ongoing support from publishers is important to faculty members making textbook adoption decisions both before and after the textbook adoption decision is made (Altman *et al* 2006). This support would be especially important for faculty members wishing to adopt supplementary digital content supplied with the textbook as they may lack the technical skills, understanding and competence needed to adopt this supplementary digital textbook content (Groves and Zemel 2000; Turner 2006; Clow *et al* 2007).

Research question one: Which textbook adoption criteria are currently being applied in textbook adoption decisions made at public universities in South Africa?

The research study expects to identify some or all of the seven textbook adoption criteria identified as important from the literature review, namely

textbook content; textbook readability; cost of the textbook to students; good illustrations and examples; supplementary digital textbook content; teaching style of the instructor and ongoing support from publishers.

Research question two: Does supplementary digital textbook content generally influence textbook adoption decisions made at public universities in South Africa?

As one of the seven textbook adoption criteria identified as important in the literature review, the research study aims to determine the extent to which supplementary digital textbook content generally influences textbook adoption decisions made at public universities in South Africa.

2.5 Categories of supplementary digital textbook content most valued by faculty members

As discussed in Section 2.4.3 one of the primary reasons that higher education book publishers include supplementary digital content with textbooks is to differentiate their textbook product in an increasingly competitive textbook adoptions market (Thompson 2005). One of the key requirements for employing an effective differentiation strategy is that the differentiating attribute or attributes should be widely valued by buyers (Porter 1985). The question of the effectiveness of supplementary digital content as a differentiating attribute for textbooks is whether it is valued by faculty members making the textbook adoption decision.

Value is a highly subjective concept with faculty members likely to perceive differently the value created by the supply of supplementary digital content with a textbook (Morris and Morris 1990; Makkar, Gabriel and Tripathi 2008). Faculty members may have no inclination to use the supplementary digital content supplied with the textbook and will not necessarily adopt the digital content simply because it is included with the textbook offering (Thompson 2005). However, studies do indicate that faculty members are increasingly making use

of supplementary digital content supplied with textbooks. In December 2004 and August 2006 the Association of American Publishers in the United States commissioned two studies into the use by college professors of textbooks that included supplementary digital content (Farmer 2006). The 2004 study found that 75% of faculty either required or recommended that their students purchased textbook packages that included supplementary digital materials. This percentage increased to 86% in 2006. The 2004 study also found that a majority of educators (55%) said that they generally adopt the supplementary content supplied with textbooks in their courses, while in the 2006 study 79% of faculty members said that less-prepared students would do better if they used the supplementary digital materials supplied with textbooks.

Some studies have provided findings that question the effectiveness of supplementary digital textbook content as a positive differentiating factor in the making of textbook adoption decisions. Marek, Griggs and Christopher (1999), for example, found a significant negative correlation ($r = -.82$) between the number of pedagogical aids in a textbook and its level of academic rigour as perceived by faculty members. Another study of psychology faculty textbook adoption criteria conducted by Landrum and Hormel in 2002 found that instructors with less experience in teaching tended to place greater importance on supplementary materials than did more experienced faculty members.

On the question of which specific categories of supplementary digital content are most valued by faculty, studies in the literature tend to be limited since supplementary digital textbook content is both relatively new and steadily evolving. Two recent studies conducted by Stevens *et al* (2007) and Clow *et al* (2007), however, provide useful insight into categories of supplementary digital textbook content considered most important by faculty members. The study by Stevens *et al* (2007) surveyed 1398 faculty members from universities throughout the United States on the issue of textbook adoption and the importance of ancillary or supplementary materials to the adoption decision. The five most important supplementary textbook materials for faculty identified in this study were: (1) supporting cases, including video cases (2) a digital

instructor's manual (3) electronic test banks (4) basic presentation slides and (5) a hard copy of the instructor's manual.

Table 2. Categories of supplementary digital textbook content identified as important to faculty members in two research studies (2007)

ANCILLARY	MEAN SCORE: STEVENS *ET AL*	MEAN SCORE: CLOW *ET AL*	COMBINED MEAN SCORE
Digital instructor's manual	3.46	3.67	3.56
Supporting cases, including video cases	3.51	3.53	3.52
Basic presentation slides	3.27	3.34	3.30
Electronic test banks	3.45	3.22	3.33
Instructor's manual (hard copy)	3.15	3.36	3.25
Test banks (hard copy)	2.84	2.83	2.84
Online class material	2.73	2.86	2.79
Video-enhanced presentation slides	2.75	2.76	2.76
CD for students	2.58	2.71	2.65
Online student quizzes	2.54	2.61	2.57
Online testing	2.19	2.37	2.28

Source: Stevens *et al* 2007; Clow *et al* 2007

A similar study conducted by Clow *et al* (2007) employing the same methodology and categories of supplementary digital textbook content as

Stevens *et al* (2007), identified the same five categories of ancillary textbook material as most valued by faculty members, with some variation in the order of importance. The five most important categories of supplementary digital textbook content identified in this study were: (1) digital instructor's manual (2) supporting cases, including video cases (3) hard copy of the instructor's manual (4) basic presentation slides and (5) electronic test banks.

Table 2 shows the combined results from both research studies calculating an average mean of importance for each of the eleven supplementary textbook content categories used in the research studies. Based on both studies, four of the top five categories of supplementary textbook content identified were digital content: (1) digital instructor's manual (2) supporting cases, including video cases (3) basic presentation slides (4) electronic test banks and (3) a hard copy of the instructor's manual. The nine digital categories of supplementary textbook content identified in the two studies as most important to faculty members are illustrated in Figure 3.

The study by Stevens *et al* (2007) also found that textbook publishers were correct in placing a heavy emphasis on supplementary digital content, but that what may be misdirected was the type and quantity this supplementary content. The study indicated that faculty desired high quality basic supplementary content, such as presentation slides, electronic test banks and instructor manuals provided on compact disc. Rather than adopting a publishing strategy of increasing the range of supplementary digital materials offered, the researchers argued that publishers may gain more adoptions by enhancing existing supplementary digital content in the areas most valued by faculty.

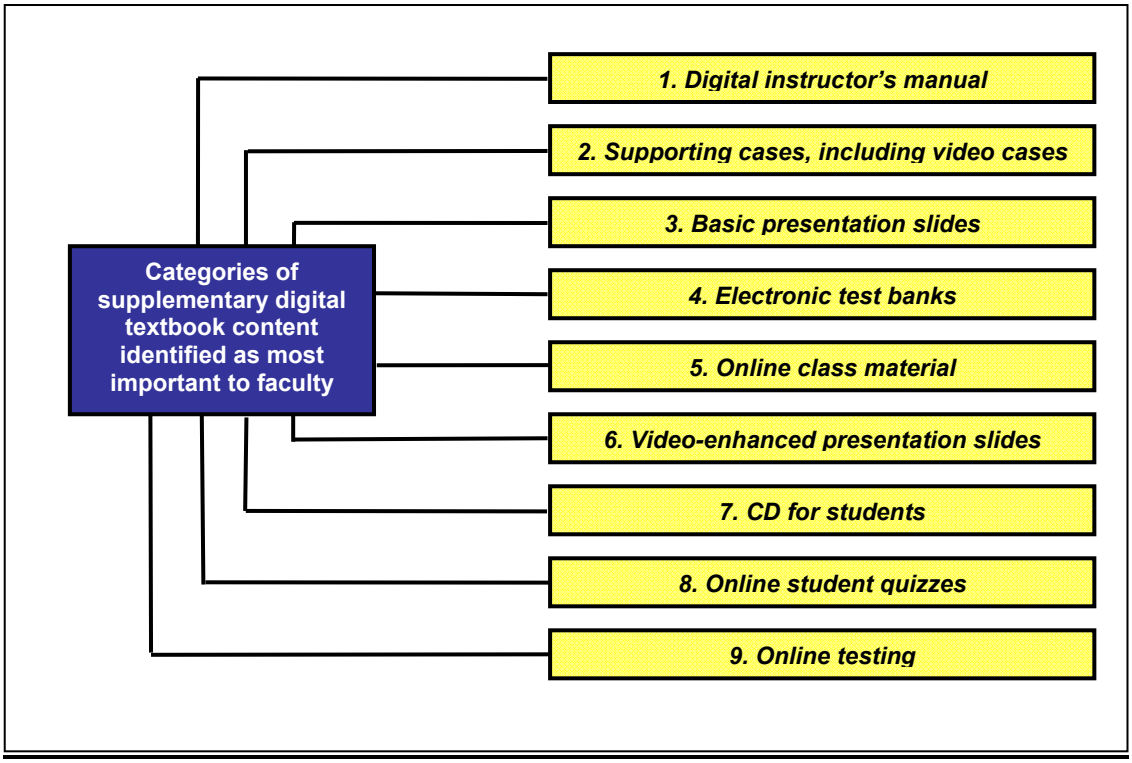


Figure 3. Categories of supplementary digital textbook content identified as most important to faculty members in studies conducted by Sevens *et al* (2007) and Clow *et al* (2007)

The study by Clow *et al* (2007) also found that a digital instructor's manual had an inherent time-saving benefit in that transferring selected assignment questions from an electronic instructor's manual was faster and easier for faculty than having to type the assignment questions themselves. Electronic test banks were also found in the study to save faculty time in the preparation of tests for students. As more faculty members utilise electronic test banks the demand for a hard copy of the test banks is likely to decrease while the use of online quizzes is likely to increase as faculty members become more comfortable in their use (Clow *et al* 2007). Respondents also reported that they valued supplementary cases and basic presentation slides that could be used in their classroom instruction.

Research question three: What are the categories of supplementary digital content most valued by faculty members making textbook adoption decisions at public universities in South Africa?

2.6 Benefits from the adoption of supplementary digital textbook content by faculty members

One of the factors that directly influences the speed of adoption of an innovation is its relative advantage, or perceived benefits, over previous products for the potential adopter (Boone and Kurtz 1989; Hall and Elliot 2003). While some researchers agree that supplementary digital textbook content can benefit both the instructor and the student and are a valid criterion in comparing textbooks for adoption (Gurung 2003; Altman *et al* 2006; Stevens *et al* 2007), other researchers have questioned whether the inclusion of supplementary digital textbook content with textbooks offers real benefits to adopters (Marek *et al* 1999; Landrum and Hormel 2002).

Studies in the literature have, however, identified a number of potential benefits to faculty members from the adoption of supplementary digital textbook content, which are discussed next.

2.6.1 The use of supplementary digital textbook content should enhance student learning

Findings in the literature regarding the impact of the use of supplementary digital textbook content on student learning are mixed. The study conducted by Groves and Zemel (2000) of factors that influence faculty's use of instructional teaching technologies found that 97% of faculty members interviewed identified improved student learning as one of the key benefits to using digital technologies in the classroom.

Table 3. Factors influencing the adoption of instructional teaching technologies in the classroom by faculty members

FACTOR	PERCENTAGE OF RESPONDENTS RATING FACTOR AS IMPORTANT
Equipment availability	97
Improved student learning	97
Increased student interest	96
Advantages over traditional methods of teaching	92
Ease of use	91
Time needed to learn	91
Training available on how to use	87
Compatibility with discipline	86
Personal comfort with technology	80
Compatibility with existing materials	77
Frequency of use by departmental colleagues	35

Source: Groves and Zemel 2000

The positive effects on learning from using supplementary digital content was further supported by a study by Gurung (2003) which found that students who reported using pedagogical aids such as practice test questions and online quizzes perceived using these aids as helpful in their studies. A study by Goolkasian, Van Wallendael and Gaultney (2003) showed that performance was better for students that used online pedagogical digital content than for students using a traditional textbook, with 54% of the students in this study agreeing that a website was more useful for learning than a paper-based textbook was. In the study by Dickson, Miller and Devoley (2005) it was found

that undergraduate students who complete supplementary exercises tend to perform better in multiple choice examinations than those who weren't required to complete these exercises. Gurung (2005) found that there is a positive correlation between the meta-cognitive study skills developed in taking quizzes and practice exercises (common forms of supplementary digital textbook content) and better test results. The same study identified that computerised quizzes can be helpful to student learning if students use them to assess their progress in learning and to identify where they most need to focus their study efforts. A 2006 study conducted by the Association of American Publishers of faculty members on their use of textbooks with supplementary digital textbook content found that 79% believed that less-prepared students would do better in their studies if they used the supplementary digital materials supplied with textbooks (Farmer 2006).

However, other empirical studies have failed to find evidence of a positive correlation between the use of supplementary digital textbook content and better academic performance by students (Weiten, Deguara, Rehmke and Sewell 1999; Gurung 2003, 2004). A 2001 study by Brothen and Wambach found that using computerised quizzes to learn course materials was less effective than reading the materials as a study technique. The study by Goolkasian *et al* (2003), while supporting better performance for students using online pedagogical digital content, also found that student class attendance was a more reliable predictor of course performance than time spent with any of the online materials and tools. It is also argued in the literature that, if the use of supplementary digital textbook content by students is less effective for student learning than study time spent on traditional content, then the use of the supplementary digital content may even be counterproductive for students who spend time on this content instead of on more effective learning tools (Brothen and Wambach 2001).

2.6.2 The use of supplementary digital textbook content should improve faculty teaching effectiveness

The adoption of presentation software by instructors in the classroom allows instructors to present text and images, including photographs; to animate text and graphics; and to include audio and video files. Some studies show that the use of presentation software by instructors in the classroom leads to better undergraduate student learning, satisfaction and engagement (Hardin 2007). Gurung (2003) also found that the use of instructional technologies is especially valuable in teaching large introductory classes.

Students with highly visual learning styles appear to get better results from multi-media classroom instruction (Hardin 2007) with approximately 60% of today's students being visually-dominant learners (Hall and Elliot 2003). A 2008 study found that participants in a slide-show-supplemented lecture demonstrated more learning than participants in traditional lecture conditions (Hove and Corcoran 2008).

One of the benefits of using supplementary digital content in the classroom is that it allows faculty to use technology to relate course content more closely to practice and to provide opportunities for the application of course knowledge (Groves and Zemel 2000). Supplementary digital content such as audio and video can be used here to show experiments in class as well as real world applications and demonstrations.

The use of study presentation software by instructors in the classroom is preferred by college students and is increasingly expected of university instructors. However, a study by Hardin (2007) found that presentation software may enhance the teaching of some instructors but may also detract from the teaching of others. Instructors should thus carefully consider their teaching style, comfort using technology and training and experience using presentation software before using it in their teaching.

2.6.3 The use of supplementary digital textbook content should enhance student engagement

The study by Groves and Zemel (2000) of factors influencing faculty use of instructional teaching technologies found that 96% of faculty interviewed believed that improved student interest was the third most important benefit resulting from using digital technologies in the classroom (Table 3). A study by Medlin (2001) identified a number of social, organisational and personal factors that have an influence on a faculty member's decision of whether or not to adopt electronic technologies in the classroom. Of the social factors identified, the growing use of electronic technologies by students was the most influential (Medlin 2001).

A 2007 study measuring student and faculty preferences for using electronic books (e-books) versus paper-based books (p-books) revealed distinct differences between student and faculty preferences regarding the use of digital content (Nelson 2008). The results of the study are shown in Table 4. Nearly a quarter (24.5%) of students preferred e-books over p-books for conducting research and nearly one fifth of students (18.5%) preferred using e-textbooks over p-textbooks. In contrast, only 8% of faculty reported preferring using e-books for research while no faculty members preferred to use e-textbooks for study or e-books for leisure reading (Nelson 2008).

This recent study (Nelson 2008) was based on previous findings by the author that students are more likely to be early adopters of digital content and emerging technologies than the general population may be expected to be (Nelson 2006). There is a growing trend where younger users of information technology want only the specific information required and the flexibility to mix and match digital content (Daniels 2006). Students are increasingly expecting more choice and flexibility in how they access and use pedagogic content (Nelson 2006). Students also want access to pedagogic information and content via as many channels as possible, both on their personal computers and on the

Table 4. Student and faculty preferences in the use of paper-based or electronic content in conducting research, textbook usage and leisure reading

COLLEGE STUDENTS	CONDUCTING RESEARCH	TEXTBOOK USAGE	LEISURE READING
P-Book	53.3%	67.5%	80.1%
E-Book	56.3%	18.5%	2.6%
No Preference	24.5%	7.9%	11.3%
No Response	13.2%	6.0%	6.0%
COLLEGE FACULTY	**CONDUCTING RESEARCH**	**TEXTBOOK USAGE**	**LEISURE READING**
P-Book	80.0%	92.0%	92.0%
E-Book	8.0%	0.0%	0.0%
No Preference	8.0%	4.0%	4.0%
No Response	4.0%	4.0%	4.0%

Source: Nelson, *E-Books in Higher Education*, 2008: 9

many portable devices that increasingly enter the market, such as mobile phones, MP3 players, e-readers and even gaming devices. While supplementary digital textbook content is not designed to *replace* traditional printed textbook content but rather to *enhance* it, there is growing pressure on higher education book publishers to supply their pedagogical content in multiple formats designed to be distributable on multiple electronic devices (Nelson 2006).

2.6.4 The use of supplementary digital textbook content should save faculty members time

Porter (1985) identifies two ways that a firm creates value for buyers:

1. *By lowering buyer costs*: Faculty member responsibilities can be broadly grouped into three categories (1) teaching (2) research and (3) administration. Supplementary digital textbook content such as publisher presentation slides and interactive test banks are designed to save faculty members time in their teaching and administrative duties. The saving of time costs for faculty members should be valuable given the growing pressure on faculty at public universities in South Africa to conduct additional research studies and to publish the research results. By increasing efficiency for faculty in class preparation time and time spent on administration duties such as the marking of tests, supplementary digital textbook content should facilitate more time being available for research activities by faculty members.

2. *By raising buyer performance*: Raising a buyer's performance requires first understanding what constitutes desirable performance for the buyer and then providing tools to help enhance that performance (Porter 1985). Supplementary digital textbook content such as instructor manuals, teaching notes, classroom instruction tools, video case studies, video clips and audio clips are all designed by higher education publishers to facilitate enhanced faculty teaching performance.

A study of faculty by Clow *et al* (2007) found that faculty members' use of digital instructor's manuals tended to save faulty members preparation time. Transferring assignment questions selected from an electronic instructor's manual was faster and easier or faculty than developing new questions, while electronic test banks were also found to save time in test administration (Clow *et al* 2007).

Research question four: What are the benefits from adopting supplementary digital textbook content as perceived by faculty members making textbook adoption at public universities in South Africa?

2.7 Barriers to the adoption of supplementary digital textbook content by faculty members

There are a number of possible reasons for faculty members not adopting supplementary digital textbook content.

2.7.1 Lack of classroom facilities and institutional support

One of the most important barriers to the adoption of supplementary digital textbook content is the real or perceived lack of classroom facilities and institutional support. Hall and Elliot (2003) identified that the adoption of an innovation occurs at both the organisational and individual levels. It may be impossible for an individual to adopt a new technology unless the organisation simultaneously invests in supporting institution resources. Organisational physical resources together with institutional support have been found to be essential to the adoption of a new technology by faculty members. In the study by Groves and Zemel (2000) of factors influencing faculty adoption of instructional teaching technologies, equipment availability was identified as the single most important factor influencing the use of instructional technologies in the classroom. In a similar study of factors that influenced faculty's adoption of electronic technologies in the delivery of instruction, it was found that of the organisational factors expected to have an influence on this physical resource support was the single most influential (Medlin 2001).

For the adoption of supplementary digital textbook content in teaching, facilities required by faculty members include audio-visual equipment such as digital projectors, sound equipment, DVD players and laptop connectivity at the point of presentation. In addition, many faculty members require technical support from their institution, such as with setting up the equipment before a lecture and

the handling of technical problems experienced during the presentation, to be able to adopt some of the supplementary digital content supplied with textbooks in their classroom instruction on an effective and ongoing basis.

2.7.2 Lack of faculty technical skills

Even if institutional facilities and support are made available, faculty may lack the technical skills, understanding and competence needed to adopt supplementary digital textbook content. Faculty members may feel under-prepared for the demands of using technology in their lectures because of having had little or no instruction in its use (Turner 2006; Clow *et al* 2007). Consequently they may not be willing to risk the technology failing during instruction. The study by Groves and Zemel (2000) of factors influencing faculty adoption of instructional teaching technologies found that faculty believed training on how to use the new technologies (87%) and time needed to learn how to use the new technologies (91%) were both important, very important or critically important to their adoption of these new technologies in the classroom (Table 3).

2.7.3 Lack of understanding by faculty of the benefits of supplementary digital textbook content

Groves and Zemel (2000) also found that 92% of faculty members interviewed believed that knowing the *advantages over traditional methods of teaching* of a new technology was important to whether they adopted the new technology in the classroom or not. It may be that faculty members at public universities in South Africa do not fully appreciate all the benefits of using supplementary digital textbook content on their courses.

There may be a need for better signalling criteria by higher education publishers on the benefits to faculty in adopting supplementary digital textbook content. Signaling criteria are purchase criteria that stem from signals of value used by the buyer to determine the value of a firm's offering. It is important that firms do

not underestimate the need to effectively signal the differentiated value of their offering to potential buyers in the market (Morris & Morris 1990). Signaling criteria are important because the buyer might not fully understand all the ways in which a firm's offering could benefit them by lowering their costs or improving their performance. Signaling criteria can be included in publisher activities such as presentations by sales representatives, advertising, sales promotions and public relations (Porter 1985).

2.7.4 Established teaching methods

Hall and Elliot (2003) found that established teaching methods, together with faculty autonomy, can act as an effective barrier to the adoption of new technologies in teaching and learning environments. For faculty members that have developed and refined their classroom teaching materials, often over many years, adopting new digital technologies supplied by publishers with the textbook may well be seen as creating additional and unnecessary work on their part.

2.7.5 The use of and access to supplementary digital content by students

One of the potential barriers for faculty members in adopting supplementary digital textbook content on their courses is whether students would be both willing and able to use this digital content. Students often find supplementary digital textbook content provided by publishers of little value or relevance (Altman *et al* 2006) and are generally unlikely to make use of it (Dake 2007). However, the use of supplementary digital content by students seems to be influenced by more than one factor. Marek *et al* (1999) found that first semester students are more likely to use supplementary materials than more advanced students are likely to be. The evaluation and use of supplementary digital content by students also appears to be driven by practical and more immediate perceived benefits, especially with regard to test and examination preparation (Marek *et al* 1999; Weiten et al 1999). Students are more likely to use interactive test banks, for example, if these tests are seen as an effective way to

master prescribed course material in preparation for tests and examinations (Brothen and Wambach 2001).

The demand for the supplementary digital textbook content by students is essentially a *derived* demand with the course instructor effectively determining the usage of this supplementary content by students (Nelson 2006, 2008). It is recognised in the literature that supplementary content needs to be prescribed for courses if students are likely to use the material (Marek *et al* 1999; Foucault & Scheufele 2002; Gurung 2004; Dickson *et al* 2005; Thompson 2005). The study by Gurung (2004), for example, found that if students achieve poor results in early examinations on a course this did not lead to the voluntary use of digital pedagogical aids such as online quizzes and practice exercises. In the study by Dickson *et al* (2005) even those students that indicated that they had found the completion of supplementary exercises helpful in their learning also indicated that they would be less willing to voluntarily complete similar exercises in the future. It has also been found that, in addition to prescribing supplementary digital textbook content for students, instructors also need to guide students in the use of the supplementary content to enhance the effectiveness of the material in achieving student learning (Gurung 2003, 2004; Clow *et al* 2007).

However, even if the supplementary digital textbook content is prescribed for students and students are guided in its use, students may be *unable* to complete the work prescribed using supplementary digital textbook content due to barriers of access.

1. *Lack of access to online materials and resources***.** Not all students in South Africa have equal access to online resources. Limited access to university or personally owned computer equipment is a key barrier to student use of CD-ROM and other electronically-based textbook materials (Cush and Buskist 1997; Rosenfeld 2006). While public universities in South Africa generally have on-campus computer laboratories, these facilities may be insufficient to meet the needs of large classes, in some cases with as many as 2000

students, that may well require access to prescribed online digital material over the same peak time periods.

2. *Lack of access to the supplementary digital textbook material***.** Faculty may be reluctant to prescribe supplementary digital textbook content if all students do not have equal access to this supplementary content. With escalating textbook prices students are increasingly resorting to copying, borrowing or sharing textbooks with other students or using library copies of the textbook (Thompson 2005). Using alternatives such as these to buying a copy of the prescribed textbook may preclude access to the supplementary digital textbook content that is bundled with textbooks. Libraries, for example, do not always include the supplementary CD or DVD with loan copies of textbooks because of the risk of theft.

Research question five: What are the barriers to adopting supplementary digital textbook content as perceived by faculty members making textbook adoption decisions at public universities in South Africa?

2.8 Research questions identified from the literature review

The five research questions identified from the literature review to be answered in the research study therefore are:

1. *Research question one:* Which textbook adoption criteria are currently being applied in textbook adoption decisions made at public universities in South Africa?

2. *Research question two:* Does supplementary digital textbook content generally influence textbook adoption decisions made at public universities in South Africa?

3. *Research question three*: What are the categories of supplementary digital content most valued by faculty members making textbook adoption decisions at public universities in South Africa?

4. *Research question four***:** What are the benefits from adopting supplementary digital textbook content as perceived by faculty members making textbook adoption at public universities in South Africa?

5. *Research question five*: What are the barriers to adopting supplementary digital textbook content as perceived by faculty members making textbook adoption decisions at public universities in South Africa?

3. RESEARCH METHODOLOGY

The research methodology employed in this research study adopted a qualitative research methodology; collected generated, primary data; utilised in-depth, semi-structured personal interviews and applied content analysis to the qualitative data.

3.1 Adoption of a qualitative research methodology

The reasons for adopting a qualitative research methodology over a quantitative approach in this study were:

3.1.1 The nature of the research question

A qualitative research methodology was adopted for this research study due to the nature of the research problem itself. In trying to understand the adoption decision of textbooks with supplementary digital textbook content the research was exploratory and interpretive in nature, rather than confirmatory or predictive. This type of research problem is better suited to a qualitative over a quantitative research methodology (Creswell 1998; Leedy and Ormrod 2001).

The research problem was also complex in nature with a number of variables potentially impacting on textbook adoption decisions and the role supplementary digital content may play in these decisions. One of the strengths of qualitative data is their richness and potential for revealing this type of complexity (Miles and Huberman 1994).

3.1.2 Flexibility within the research process

As the research was exploratory in nature a qualitative research methodology had the benefit of being more flexible allowing the adaption of questions used in the personal interviews to explore emergent factors relevant to the research questions. As Creswell (2003) points out, one of the important characteristics of

qualitative research is that it is emergent, allowing the research questions to be refined during the data collection process.

3.1.3 Analysis of the data

Researching the role played by supplementary digital textbook content in textbook adoption decisions involved inductive rather than deductive reasoning. Inductive reasoning is better suited to a qualitative research methodology (Leedy and Ormrod 2001) as the qualitative research methodology is fundamentally interpretative (Creswell 2003). The analysis of the data generated from the twenty-four interviews conducted in this research study required interpretation to understand faculty member motives and perceptions in answering the five research questions employed in the study.

3.2 The collection of generated and primary data

The nature of the data to be collected, to a large extent, determines the research methodology adopted in the research study (Leedy and Ormrod 2001). The data collected in this research study were both generated and primary data.

3.2.1 Naturally occurring data and generated data

Lewis (2003) draws a distinction between naturally occurring and generated data collected in a qualitative research study. Naturally occurring data are studied using methods such as observation, document analysis, analysis of conversation and discourse analysis; while generated data are primarily generated through the use of in-depth interviews and focus groups.

This research study required generated data. As the research was exploratory, generated data allowed a deeper understanding of the views of faculty on textbook adoption decisions and the role played by supplementary digital textbook content in making these adoption decisions. If collecting naturally occurring data, such as by observing the use or non-use by faculty members of

supplementary digital textbook materials in the classroom, the motivations for the use or non-use of the materials would not have been clear and the naturally occurring data would probably not have given a sufficiently full picture of the research problem being explored (Lewis 2003). Thus, given the exploratory and subjective nature of this research study, a generated data collection method was used rather than the collection of naturally occurring data.

3.2.2 Generation of primary data versus relying on secondary data

The research study generated primary qualitative data through the direct interviewing of faculty members responsible for textbook adoption decisions rather than by relying on secondary data. Leedy and Ormrod (2001) argue that primary data is often more illuminating than secondary data is and, given the exploratory nature of the research problem in this study, there was limited secondary data available specifically on the role played by supplementary digital textbook content on textbook adoption decisions made at public universities in South Africa.

3.3 Use of in-depth and semi-structured interviews

According to Lewis (2003), personal interviews as a method for collecting qualitative data are appropriate for (1) generating in-depth personal accounts; (2) understanding the personal context of issues; and (3) understanding complex processes and issues, such as personal motivations. All three of Lewis' criteria for the use of personal interviews in data collection applied to this research study. In exploring the question of the role that supplementary digital textbook content may play in textbook adoption decisions, the personal perspectives of faculty responsible for making the adoption decisions (1) need to be understood in depth (2) need to be understood in the personal context of the decision-maker (3) need to be understood as an often complex decision-making process with many potential personal motivations influencing the adoption decision. The research study involved exploring the personal perspectives of faculty members responsible for making textbook adoption

decisions and needed to be firmly set in the context of the personal experience and insights of these faculty members, making the personal interview the appropriate source of data for the study (Wisker 2001).

Bell (2005) argues that an additional advantage of the qualitative personal interview has over a quantitative survey is its adaptability:

> "A skilful interviewer can follow up ideas, probe responses and investigate motives and feelings, which the questionnaire can never do. The way in which a response is made (the tone of voice, facial expression, hesitation, etc) can provide information that a written response would conceal. Questionnaire responses have to be taken at face value, but a response in an interview can be developed and clarified." (Bell 2005: 157).

As this research study was exploratory and unanticipated variables were expected to emerge, the flexibility of the personal interview was an additional reason that it was employed in this study.

The interviews were conducted in a semi-structured framework. The semi-structured interview addresses the need for comparable responses - the same questions were being asked of each faculty member interviewed - while still giving the interviewee the opportunity to expand and develop their ideas and allowing for possible divergence before returning to the pre-structured interview questions (Wisker 2001).

3.4 Population and sample

In the research study public university faculty members who been involved in making textbook adoption decisions were interviewed at their respective institutions. Each of the respondents agreed to the interview being tape-recorded which allowed for better interview data capture and each interview was conducted at the higher education institution and office of the respondent.

There are six public universities in the Gauteng Province of South Africa, two of which are located in Johannesburg (see Table 5). A convenience sample of the two Johannesburg-based public universities was used in the study. The two institutions in the sample were the University of Johannesburg, a comprehensive public university and the University of the Witwatersrand, a traditional public university.

Table 5. Public universities located in Gauteng, South Africa

INSTITUTION	INSTITUTIONAL CATEGORY	LOCATION
University of Pretoria	Traditional University	Pretoria
University of the Witwatersrand	Traditional University	Johannesburg
University of Johannesburg	Comprehensive University	Johannesburg
University of South Africa	Comprehensive University	Pretoria
Tshwane University of Technology	University of Technology	Pretoria
Vaal University of Technology	University of Technology	Vanderbijlpark

Source: Government Department of Education

Leedy and Ormrod (2001) suggest that between five and twenty-five interviews make up a typical interview sample size in studies of this nature. Twelve interviews were therefore conducted at each of the two public universities used in the study, making up twenty-four interviews in total.

The interviews in the study were held across four faculties at the two institutions:

1. Faculty of Science
2. Faculty of Engineering
3. Faculty of Economics and Management Sciences
4. Faculty of Humanities

These faculties were selected to obtain data from the more quantitative disciplines, such as Science and Engineering; the more qualitative disciplines, such as the Humanities; and a discipline that represents a mixture of both quantitative and qualitative course content, such as Economic and Management Sciences. Six faculty members were interviewed in each of the four faculties, three from each of the two institutions. To obtain data as comparable as possible faculty members were selected from the same three schools (at Wits University) or departments (at the University of Johannesburg) in each of the four faculties included in the study.

3.5 Use of qualitative content data analysis

The qualitative data generated from the semi-structured interviews required content analysis to identify common themes and patterns in the responses generated from faculty members. As Leedy and Ormrod (2001) point out there is no single, correct method in analysing data generated from a qualitative study. Rather, the researcher works with a large body of information and must use inductive reasoning to sort and categorise it and to identify the underlying themes to the data (Leedy and Ormrod 2001; Bell 2005).

The analysis of the qualitative data generated by the study broadly followed the framework presented by Creswell (2003), while also drawing from the thematic method framework of Ritchie, Spencer and O'Conner (2003).

1. *Preparation of the data*. Audio tapes of the interview and observational notes taken during the interviews were used in the collection of the qualitative data. The audio tapes were used to develop detailed and often verbatim notes of the interviewees' responses to questions. The result was qualitative data that was detailed but large in volume and a systematic process to manage and organise the data was essential for the analysis phase of the research study.

2. *Organisation of the data*. The data were then classified and organised according to key themes, concepts and emergent categories and as far as possible themes or topics identified in the data were described in terms as close to the original language of the interviewee as possible (Creswell 2003; Ritchie *et al* 2003). This gave a general sense of the data generated from the interviews and their overall meaning (Creswell 2003), while being able to review the audio tapings and interview notes was an essential tool in this phase of the content analysis.

3. *Labelling and tagging the data*. More detailed analysis was then facilitated by labelling and tagging the material with a short descriptive term that again used language as close to that of the respondent as possible. Labelling or tagging are terms preferred to 'coding' in describing the process used here because coding implies a level of precision that was not available in this stage of the analysis. The process here rather involved carefully reviewing each response by the faculty member and considering what the data were essentially about (Ritchie *et al* 2003).

   A spreadsheet was developed for each of the fifteen questions in the interview guide with separate rows allocated to each respondent. As the researcher completing the analysis was also the person that conducted all the interviews and with both interview observation notes and recordings of the interviews available, care was taken not to use any interview data out of content – a potential danger when breaking down interviewee responses into thematic components (Ritchie *et al* 2003).

4. *Summary and synthesis of the data*. This stage was designed to reduce the amount of overall material to a more manageable amount and to begin distilling the essence of the interviewee responses in terms of answering the six research questions. In the summary and synthesis of the data, all data were worked through systematically to ensure that all interviewee responses were considered for information relevant to the research questions. Key terms, phrases or expressions were retained in the interviewee's own

language as far as possible and material was not removed simply because its initial relevance was not clear. It was understood that issues that did not make sense in the early stages of analysis may well become important in the later interpretative stages of *analysis* (Ritchie *et al* 2003), as proved to be the case in this research study.

5. *Interpretation of the data*. The summarised and synthesised data were then interpreted to establish their meaning in terms of the research questions and sub-problems identified in the research study. Interviews were analysed for relevant statements made by the interviewees as they related to each of the research questions. Recurring patterns and themes were prioritised and clustered to identify the variables most useful in answering each research question. Relationships between these variables were examined and the study attempted to relate the findings back to general theoretical frameworks already identified in the literature review.

3.6 Reliability

Bell (2005) describes reliability as the extent to which a test or procedure produces similar results under constant conditions. Reliability is essentially a measure of *consistency* in the research study, where the measuring instrument used should produce a similar result if the same study were to be conducted in the future and if the entity being measured had not changed (Leedy & Ormrod 2001).

Due to the fact that interpretation by the researcher plays such a key role in both the interview process and with the interpretation of qualitative data it cannot be reliably stated that another researcher using the same qualitative instrument used in this study would achieve exactly the same research results.

3.7 Internal and external validity

Essentially validity is a measure of the accuracy of the research study. Internal validity means that the research study measures what it is supposed to measure and that the conclusions reached by the research can be described as credible (Leedy and Ormrod 2001; Bell 2005). This implies that the conclusions reached in this study should have been reasonably drawn from the data collected in the personal interviews conducted with faculty members responsible for making textbook adoption decisions at the two institutions included in the study.

Due to the highly subjective nature of the motivations for the use and non-use of supplementary digital textbook content and the expectations of the future role of digital content in higher education, the conclusions reached from this research study may not easily be generalised to other faculty members at public universities in South Africa. However, it is anticipated that the depth of understanding of faculty views on supplementary digital content created by this research study should provide useful insight for higher education publishers and institutions with an interest in the role played by supplementary digital textbook content in textbook adoption decisions made at public universities in South Africa.

4. FINDINGS AND ANALYSIS

4.1 Introduction

This chapter summarises the key findings from the data collected in the twenty-four interviews conducted with individual faculty members responsible for making textbook adoption decisions at the two institutions in the study. The analysis is structured around the five research questions developed to solve the research sub-problems. Reference to supporting or contrasting theory identified in the literature review is included in the analysis of the findings.

4.1.1 Prescribing of a textbook

Each of the twenty-four faculty members interviewed in the study prescribed textbooks for the courses that they taught. The value in prescribing a textbook in higher education is widely supported in the literature (Quereshi and Zulli 1975; Chatman and Goetz 1985; Sommer *et al* 1988; Ade-Ridder 1989; Griggs 1999; Stein *et al* 2001; Rosenfeld 2006; Stevens *et al* 2007; Clow *et al* 2007).

A reason given by some faculty members for prescribing a textbook was that students needed to improve their literacy skills and one of the best ways to help students achieve this was for them to work through a well-structured textbook. Some faculty members felt that a disadvantage in prescribing a textbook for a course was that the instructor then had to rely primarily on one source of information rather than being able to draw from a variety of sources, such as other books, journal articles and newspaper articles. However, other faculty members interviewed felt that the instructor was free to supplement a textbook with a reading pack or individual articles made available to students at the start or over the duration of the course. Some faculty felt that adopting a textbook provided the instructor with less flexibility in how the course was structured because of the need to follow the pre-determined content structure of the textbook. On the other hand some faculty members preferred using a textbook because it gave their courses more underlying structure while others believed

that it was only *preferable* that the structure of a course followed that of the adopted textbook and did not see any loss of flexibility in adopting a textbook for their courses.

Some respondents indicated that they used textbooks on undergraduate courses but not on more advanced and post-graduate courses, where reading packs were more commonly employed. A reason given for this was that appropriate textbooks are not always available for post graduate courses. As one respondent in the Faculty of Humanities at the University of Johannesburg stated:

> "For the post-graduate course I teach I simply could not find an appropriate textbook because of the specialised nature of the course. Instead, I compile the notes for this course from various readings."

Studies in the literature support prescribing a textbook for introductory and undergraduate courses where textbooks provide a crucial theoretical foundation for students new to the discipline (Griggs 1999; Stevens *et al* 2007).

4.1.2 The textbook adoption decision process

The study conducted by Landrum and Hormel (2002) found that the most common process of textbook selection was individual instructor selection (64.5%). Faculty members interviewed in this study indicated that, in almost all cases, textbook adoption decisions made in their school or department were done so by the individual faculty member responsible for teaching the course, sometimes in consultation with the head of department or another senior faculty member. In one case, the Department of Sociology at Wits University, four different instructors taught the introductory sociology course in four separate modules, which made adoption of a single textbook for the course difficult. As a result no one textbook was adopted for the course and each instructor instead supplied reading packs for their specific module.

4.1.3 *Changing a textbook once adopted*

Faculty members interviewed in the study indicated that they changed prescribed textbooks every 3 – 5 years. The changing of prescribed textbooks by faculty members on a three-year schedule is identified as typical in studies conducted in the literature (Cush and Buskist 1997; Clow *et al* 2007; and Stevens *et al* 2007).

However, some schools or departments reported that, despite reviewing their prescribed textbook annually, they had not changed the prescribed textbook in more than three years. One of the reasons given for not changing the prescribed textbook was that the frequent issuing of new editions of the prescribed textbook by publishers kept the content of the textbook selected sufficiently up-to-date. One respondent linked continuing with the same textbook for longer periods of time to an increased probability that students would buy the prescribed textbook, since students would be able to re-sell it at the end of the academic year. A clear *disincentive* for faculty members to change a textbook once adopted was the amount of additional work created for them in preparing new lecture notes and other required course materials.

> "There is tremendous inertia to changing a textbook. Once you have prepared your notes for the students, set your learning goals, set page numbers and references and developed presentation slides, it's a huge task to change." (Faculty of Science, Wits University).

In responding to the question of why faculty members did periodically change a textbook once adopted, three reasons given were:

1. *Textbook content becoming out-of-date.* If the prescribed textbook's content has become outdated then the adopting faculty member will consider replacing it with another textbook. This was reported to be especially important for subjects where course content was changing more rapidly, such as economics textbooks containing economic data where "the textbook

will be changed if the content is no longer what we are looking for and is no longer considered up-to-date" (Faculty of Economic and Management Science, University of Johannesburg). This view is supported by studies in the literature where better content in a new textbook was the most important reason for faculty members changing textbooks in the studies conducted by Clow *et al* (2007) and Stevens *et al* (2007).

2. *Test bank questions becoming known to students*. For faculty members making use of the test bank questions supplied with a textbook, a constraint to their use was students becoming familiar with the supplementary questions and this was given as a reason for periodically changing the adopted textbook. In the in the Faculty of Humanities at the University of Johannesburg, for example, this was indicated to be the primary reason for changing textbooks every three years for the introductory psychology course.

3. *Institutional requirements to change textbooks*. The higher education institution itself may require that faculties change textbooks at stipulated periods. In the Faculty of Humanities at Wits University, for example, the prescribed textbook was reviewed every year and it was an institutional requirement that the textbook was changed at least every five years. Another respondent in the Faculty of Economic and Management Sciences at the University of Johannesburg indicated that the institution was considering making it a policy for faculty to change the adopted textbook at least every three years.

Generally, updating to new editions of a textbook was seen by faculty members as preferable to changing to an entirely new textbook. On the other hand, faculty members were sometimes frustrated by higher education publishers bringing out new editions of prescribed textbooks with what they considered to be too much frequently. The reason for this frustration was that adopting a new edition of a textbook required the updating of lecture notes, course packs and student notes. Faculty members were not always convinced of the need for

each new edition of a published textbook and indicated that there sometimes seemed to be “very little difference between the old and the new editions” (Faculty of Science, Wits University). Once the new edition was published, however, faculty had little choice but to either change to a completely new textbook or adopt the new edition as the previous edition of the adopted textbook would no longer be imported by publishers and made available to students in local academic bookstores.

4.1.4 Textbook adoption and student learning

In much the same way as the literature is divided on the extent to which the textbook adopted may or may not make a difference to student learning, faculty members interviewed had differing views on whether the textbooks that they adopted made a difference to student learning.

Some respondents believed strongly that the choice of textbook impacted positively or negatively on student learning, a view supported by some studies in the literature (McKeachie 1976; Morris 1977; Griggs 1999). Other faculty members felt that while certain textbooks were better in certain areas of the discipline, provided that the textbook supported what they taught in the classroom and gave theoretical support for the examples and exercises included in the course then the choice of textbook did not make an important difference to student learning. This view is supported in the literature with, for example, a study by Podolefsky and Finkelstein (2006) finding that there is little correlation between student textbook reading and course grades achieved. Durwin and Sherman (2008) argue that there is little empirical evidence that using different textbooks impacts differently on student learning. Other faculty felt that the choice of textbook did not make a significant difference to student learning because the textbook was used more as a reference book on their courses rather than as core content to be relied on in detail by students.

One of the reasons that a number of faculty members interviewed believed that the choice of textbook did not make an important difference to student learning

was that there was, in their view, little essential difference between textbooks submitted to them for adoption. This was considered especially the case with North American textbooks, which one respondent in the Faculty of Science at Wits University described as “clones of each other” and one respondent in the Faculty of Humanities at Wits University considered as “much of a muchness”. One respondent in the Faculty of Engineering at the University of Johannesburg described this perception as:

> “The textbooks available for this course are very similar – eighty percent of them have a very similar approach, even to the extent of having similar chapter numbers.”

This view of increasing conformance in textbook content is supported by some studies in the literature (Quereshi 1993; Cush and Buskist 1997; Durwin and Sherman 2008) but not by others (Chatman and Goetz 1985; Zeimeister and Zeimeister 2000; Griggs and Marek 2001; Griggs, Bujak-Johnson and Proctor 2004; Altman *et al* 2006; Drake 2007). Some faculty members felt that while the content of textbooks may be similar, the examples and illustrations used could vary significantly. North American examples of animals in Biology courses, for example, provided a significantly different content context to Biology textbooks that gave examples from Southern Africa. This view was expressed by respondents in the Faculty of Science at both higher education institutions included in the study.

4.2 Research Question One

Which textbook adoption criteria are currently applied in textbook adoption decisions made at public universities in South Africa?

While some faculty interviewed felt that there was no single adoption criterion that was most important to them in making textbook adoption decisions and that it was rather a combination of influencing factors, there were a number of clear themes evident from the data of what was important for faculty members in

making textbook selections. These criteria emerging from the data were often strongly supported by empirical evidence identified from studies in the literature.

4.2.1 Quality of textbook content

Textbook content was regularly described as one of the most important criteria in selecting a textbook for adoption at the two public universities in the study. As much as half of the respondents identified content of the textbook in relation to course content and objectives as the *single most important* criterion in making textbook adoption decisions. One respondent in the Faculty of Humanities at the University of Johannesburg described textbook content as "coming first and foremost" in textbook selection and that "the most important thing is that the theory that I need to cover in the course is also covered by the textbook in a structured manner."

A strong theme in the research data was that the content of the textbook needed to cover all or most of the range of content required for the course for which it would be prescribed. It also needed to have an appropriate focus of content in terms of the objectives set for the course. The rigour, the application, the accuracy and the interpretation offered in the textbook content were each described as very important in reviewing the content of textbooks submitted for adoption. As one respondent from the Faulty of Economic & Management Sciences, University of Johannesburg, put it: "The course content dictates the selection of the textbook; the textbook content must match the course overview and curriculum". Another faculty member from the Faculty of Humanities at the University of Johannesburg expressed a similar view:

> "The most important thing is that the textbook needs to be in line with the way that we present the course. The way [higher education publishers] package the information, the chapters and the order that they put it in needs to be similar to our syllabus and the way that we put our courses together. There are enough good books to choose from to make this a minimum requirement."

In addition to matching the course objectives and curriculum, some faculty members stressed that the textbook content should also match their teaching style and teaching philosophy. One example given by the Faculty of Mechanical Engineering at the University of Johannesburg of the importance of textbook content focus was the way *Science and Materials* was increasingly being taught on mechanical engineering courses in North American and European universities. A new approach is being adopted at these institutions that is far broader in terms of teaching focus and content. This broader approach had not yet been adopted by the University of Johannesburg and the decision of whether to adopt the traditional or new approach to teaching *Science and Materials* would be critical to which textbook the faculty would adopt.

The role of textbook content as one of the most important textbook adoption criteria - often the most important criterion - is supported by empirical studies conducted in the literature (Morris 1977; Muther 1984; Smith and De Ridder 1997; Smith and Muller 1998; Altman *et al* 2006; Stevens *et al* 2007; Clow *et al* 2007). The importance of the textbook selected matching the instructor's teaching style is also supported in the literature (Morris 1977; Stevens *et al* 2007; Clow *et al* 2007).

Some studies in the literature emphasized the importance of textbook content being both current and relevant in textbook selection (Muther 1984; Smith and De Ridder 1997; Smith and Muller 1998). A study by Landrum and Hormel (2002) found that what 14% of instructors surveyed wanted to see added to introductory textbooks was material that related to more current and relevant issues in the field. However, opinions varied in the study research data on the importance of current and local content as a textbook adoption criterion. Some faculty members felt that current and local content was critical and even "the single most important factor" (Faculty of Humanities, Wits University) to textbook adoption decisions made in their faculty. Some faculty members explicitly stated that if a textbook had too much of an American focus with too many North American examples it would be removed from consideration in the textbook selection process. However, other faculty members felt that local

content was not a factor at all in their textbook selection due to the subject matter of their course being “international” (Faculty of Engineering, Wits University).

Ten of the twenty-four faculty members interviewed stated that if there was a need for more current and local examples this was easily included in supplementary readings provided by the course instructor. This approach made current and local content less of a textbook adoption criterion and more of the lecturer’s responsibility, with “the role of the lecturer [being] to put the theory as presented in the textbook into a local industry perspective” (Faculty of Engineering, University of Johannesburg). The local content supplied by the lecturer is generally in the form of articles from academic journals or newspapers that are handed out individually in lectures or provided to students in a bound reading pack at the commencement of the course. Some faculty also believed that handing out supplementary material in their classes was an additional incentive for students to attend classes rather than to have all required course content included in the textbook.

The importance of current and local content in textbook adoption decisions varied across the four faculties studied. Local content was, for example, considered more important to the teaching of marketing where local marketing and advertising examples were viewed as very relevant to students’ understanding of the theories and concepts than, for example, in the teaching of introductory chemistry where local application of knowledge was viewed as less critical. A study by Smith and Muller (1998) highlighted the importance of current content in the adoption of marketing textbooks. The Faculty of Engineering at both public universities in the study described local content as relevant to textbook adoption as the content of the textbook used needed to reflect local mining conditions. The importance of local content, however, could vary even within a discipline, such as in the Department of Anthropology and Development at the University of Johannesburg, where local content and examples were considered important in choosing a textbook for the field of Development, but not for Anthropology.

Some faculty felt that current local content had become more important since the introduction of democracy in South Africa in 1994 with the changing demography in public university classrooms.

> "Local content is very important and since democracy in 1994 has become even more important. This is more so in the biological than the physical and chemical sciences, but I know that even in the mathematics department faculty have tried really hard to find local examples. The demography in the classroom has changed and students relate far better to local examples than to North American ones." (Faculty of Science, Wits University).

Some faculty considered local examples more important for foundation or introductory courses and less important for more advanced students who "already should have the foundation knowledge" (Faculty of Economic and Management Sciences, University of Johannesburg). Other faculty interviewed had the opposite view in that, at a first year level, local content made "very little difference because we are dealing with a rather superficial presentation of basic sociological theories" (Faculty of Humanities, University of Johannesburg). Local content and examples were considered by some of these respondents to become important at more advanced levels of tuition where theory needed to be applied to local research work. Other faculty felt that local examples on their own were insufficient and needed to be linked to international examples to have the most impact on students.

On the question of adopting imported textbooks or locally published books that contained current local content, some faculty felt that South African textbooks generally did not match the quality of content of imported textbooks. Imported textbooks were widely used by the faculty interviewed who often took the view that local textbooks would only be considered if they met "the standards of presenting theory that the international textbooks do" (Faculty of Science, Wits University). South African textbooks needed to add as much value for faculty

making textbook adoption decisions without costing significantly more than the international editions considered for adoption.

4.2.2 Textbook readability and comprehensibility

In the research study 88% of respondents indicated that readability and comprehensibility of the textbook for students was an important textbook adoption criterion in their textbook selection. Two of the respondents considered readability the second most important of all textbook adoption criteria with other respondents describing readability in terms such as “crucial” or “extremely important”. This finding on the importance of readability for faculty members in textbook adoption decisions is supported by the literature. The literature clearly identifies readability as one of the most important factors to consider in textbook adoption decisions (Sommer 1980; Quereshi 1981; Tyson and Woodward 1989; Spinks and Wells 1993; Smith and De Ridder 1997; Smith and Muller 1998; Dake 2007). Students themselves have identified readability as an important textbook selection criterion (Stang 1975; Landrum and Hormel 2002; Durwin and Sherman 2008).

Thirty-three percent of respondents (33%) who felt that readability was an important textbook adoption criterion pointed out that a growing number of students registering at their institution had English only as a second, third or even fourth language. It is important that textbook content adopted by faculty at public universities in South Africa remains accessible to these students. One example given by a respondent in the Faculty of Science at the University of Johannesburg was that their faculty had changed from an English to an American textbook - primarily because the American edition was considered more readable and comprehensible for students.

Textbook readability was not considered an important textbook adoption criterion for all faculty members interviewed. A reason given by more than one respondent for readability not being an important adoption criterion was the quantitative nature of the subject matter of the courses taught by their faculty.

This applied more in science and engineering faculties where course content tended to be built more around quantitative problem solving.

> "We don't usually look closely at level of language in the textbook because the content is more mathematical in nature. How well the mathematical concepts are explained and how many worked examples are provided in the textbook would be more important in choosing between textbooks than the level of language used." (Faculty of Engineering, Wits University).

On the other hand, one faculty member from the Faculty of Economic and Management Sciences at Wits University felt that readability and understandability had become even more important as economics courses became increasingly quantitative.

> "Economics has become a lot more mathematical even at a first-year and second-year level. We look for textbooks that present this content in an understandable way without intimidating the average student. Readability and understandability are definitely factors for us in selecting a textbook."

Some faculty felt that it was important that the textbook be readable and comprehensible to the point of supporting self-study by students. The textbook content should be so clear, understandable and well-explained that, even if students did not come to class, they could still understand the material if studying on their own. Other faculty felt that readability and understandability of the textbook was most important in choosing textbooks for undergraduate courses. This view is supported in the literature which emphasises the need to match the level of academic rigour in a textbook with the academic level of the course for which it is adopted (Griggs 1999; Durwin and Sherman 2008).

4.2.3 *Cost of textbook for students*

Each of the respondents interviewed – across all the four faculties in the study - indicated that the cost of the textbook to the student was a significant factor in the choice of which textbook to adopt. Some faculty members indicated that the cost of textbooks to students was becoming more important to textbook adoption decisions as the prices of textbooks continued to rise.

> "The price of textbooks to students has not been a major adoption criterion until now – but with the prices of textbooks increasing the way they are this is becoming an important factor." (Faculty of Humanities, Wits University).

This view is supported by studies in the literature that have found that the price of textbooks directly affects the quality and affordability of higher education for students and that there is growing concern by both faculty and students regarding the escalating cost of textbooks (Sommer 1980; Quereshi 1981; Sommer *et al* 1988; Griggs, Jackson and Marek 2002; Fairchild 2004; Rube 2005; Thompson 2005; Rosenfeld 2006; Case 2006; Clow *et al* 2007; Drake 2007; Stevens *et al* 2007).

The primary reason given for concern by faculty regarding the cost of adopted textbooks for students was that students already struggle with high academic fees and rising living costs in South Africa. One respondent in the Faculty of Humanities at the University of Johannesburg referred to recent reports of students sleeping in computer laboratories to avoid the costs of travelling home, something which had not been seen before at the institution.

A second reason given for cost of the textbook being important to the textbook adoption decision was that, if too expensive a textbook was prescribed for a course, students were less likely to purchase the textbook. This view is supported in the literature (Griggs *et al* 2002; Sikorski *et al* 2002; Rube 2005). Students needed to see value in the textbook prescribed and the higher the

price of the textbook the more likely they were to share a copy of the book with other students or to rely on library copies and photocopying important sections of the textbook. Given that the textbook is considered a key component in obtaining a higher education (Rosenfeld 2006); that the textbook is often the only learning tool available to students apart from the classroom experience (Ade-Ridder 1989); and that textbooks provide a crucial theoretical foundation to many university courses (Griggs 1999; Stevens *et al* 2007), faculty making textbook adoption decisions would want to adopt a textbook that students were more likely to purchase, as was indicated in the research data.

Some faculty stated that local books were preferred over imported books due to the relative cost of the book to the student. As one respondent from the Faculty of Economic & Management Sciences at the University of Johannesburg put it:

> "We consider the ultimate cost of the book for the student as very important. This is one of the reasons why locally-written books are more viable than imported books are."

An interesting theme identified from the research data was that, while respondents frequently described cost of the textbook to the student as "very important" and "critical", only one respondent from the Faculty of Engineering at the University of Johannesburg identified price as their *single most important* textbook adoption criterion. For many other faculty members, while cost of the textbook was very important, it came second to the quality of the textbook content in the textbook adoption process. As one faculty member from the Faculty of Engineering at Wits University put it: "While I believe that the cost of introductory science and engineering textbooks in SA is prohibitively high for many students, I would put better quality of content ahead of price as a textbook selection criterion". A faculty member in the Faculty of Humanities at the University of Johannesburg expressed a similar view: "Cost of the textbook to the student is considered but it is not the primary concern. The quality of the textbook's content would be more important to me".

Some faculty believed that the importance of cost of the textbook to students in textbook adoption decisions was diminished to some extent by the fact that many students at public universities in South Africa were on scholarships or bursaries. This was especially the case in the Faculty of Engineering where the majority of students (and as many as 90% of senior students) were reported to be sponsored by mining companies with specific allowances for textbooks. As one faculty member in the Faculty of Engineering at Wits University described their faculty's attitude to the cost of textbooks for engineering students:

> "We do consider cost of the textbook to students but this is becoming less important since many of our students are on bursaries and receive an allowance for books."

Other faculty members, however, felt the fact that students were on bursaries was *not* a reason for the cost of the textbook to be considered any less important as an adoption criterion: "The fact that the students may be on bursaries is not an issue that I consider" (Faculty of Economic & Management Sciences, University of Johannesburg).

While many faculty members felt that the cost of textbooks to students was not the primary textbook adoption criterion and would be considered in most cases only after the quality of content of the textbook, respondents did feel that if the quality of content in two textbooks was roughly equal then they would adopt the lower-cost textbook.

> "If two similar books had a price differential of 20% I'd certainly go for the cheaper one. I would feel uncomfortable prescribing a book that is going to hurt students financially when I know that there is an adequate one available at a cheaper price." (Faculty of Science, University of Johannesburg).

This view is supported in the literature where it is argued that a higher price for a textbook is not an indicator of quality of content supplied (Quereshi 1981) and

that faculty should give preference to the lowest cost textbook option when the educational content provided by textbooks competing for adoption is largely the same (Sommer *et al* 1988; Fairchild 2004; Rube 2005; Case 2006).

On the question of whether publisher representatives deliberately de-emphasised the retail price to students of textbooks submitted for adoption (Sommer *et al* 1988; Case 2006), the respondents reported that this was not generally the case from their experience and that publisher representatives were forthcoming with pricing information on the expected cost of the textbook to students (Rosenfeld 2006).

A number of faculty interviewed indicated that they actively looked for ways to keep down the cost of textbooks to students. These included deliberately rationalising the number of textbooks prescribed per course; prescribing one book at first year level that is continued to be used on second and third year courses; adopting locally produced books; changing textbooks if the price of the adopted textbook was deemed to have become too expensive; identifying whether there is an international student edition that the booksellers can bring in at a special price; and arranging with publishers that the university or faculty library purchase copies of the hardback edition while paperback editions, which are generally sold at lower prices by book retailers, are imported for students to purchase.

Other faculty members indicated that they consider which textbooks other South African institutions are adopting since the more institutions that adopt a particular textbook the greater the economies of scale achieved for importing publishers and the more likely the cost to students for the book will be less. Some faculty suggested that they only adopt textbooks for a course within a certain price-band. In 2007, for example, the Faculty of Humanities at the University of Johannesburg restricted the cost of textbooks to students for a course to between R500 and R600. Certain faculty reported that they simply do not consider a textbook for adoption if priced above a certain value: “If the publisher’s representative tells me that a book will cost R700 in the bookstores

then I would consider it excessive and not prescribe the book" (Faculty of Humanities, University of Johannesburg).

Another method faculty members used to help keep down the cost of textbooks to students was supplying students with reading packs instead of requiring them to buy a prescribed textbook. This was considered an option where only a limited percentage of a textbook would be used on a course. In the Department of Sociology at the University of Johannesburg, for example, approximately only 10% of the prescribed book was used on the first year course and students were therefore not required to buy the textbook. Instead, material was supplied to students in reading packs under a university-wide copyright agreement for the published material. Respondents in the Faculty of Engineering at the University of Johannesburg reported that faculty had been specifically instructed by the university not to prescribe a textbook if only a fraction of the textbook would be used. Faculty in this study indicated that they generally use between 50% and 80% of the textbooks that they prescribe for their courses.

Some faculty responded to the high cost of textbooks by recommending rather than prescribing textbooks to students wherever they felt it was possible for them to do so. The School of Chemistry in the Faculty of Science at Wits University does not prescribe the first year chemistry textbook for students that do not do the full year of this chemistry course. Medical students, for example, do a half-year of chemistry with the first-year textbook being highly recommended rather than prescribed for these students. (In the 2008 study of South African students conducted by Yellowwood (Robinson 2008), however, students clearly indicated that they were very unlikely to purchase a book that was only recommended rather than prescribed). Other faculty members indicated that they placed university-funded, multiple copies of prescribed books in either the university library or faculty resource centre for students to access on a short-loan basis. The School of Mining Engineering in the Faculty of Engineering at Wits University, for example, makes extensive use of this system instead of requiring students to buy their own copies of prescribed textbooks.

4.2.4 Textbook illustrations and examples

It was clear from the research data that faculty review how illustrations and graphics are presented in a textbook as important in the presentation of new theory and concepts for students in evaluating textbooks for adoption. Nine of the twenty-four respondents (38%) pointed out the importance of good illustrations and worked examples in their choosing between textbooks. Good illustrations, clear artwork, easily understandable diagrams, realistic images and the effective use of colour were each identified as important in evaluating textbooks for adoption. Faculty members also indicated the importance of examples that were relevant to the learning objectives of the course and to the local South African context in certain disciplines. This finding is supported in the literature where effective use of good graphics and well-presented illustrations within textbook content is considered to play a direct influence in textbook adoption decisions (Muther 1985). The importance of relevant worked examples and solved problems is also emphasised in the literature (Morris 1977; Smith and Muller 1998; Landrum and Hormel 2002; Robinson 2008).

4.2.5 Ongoing support from publishers' representatives

Ongoing support from the publishers' representatives, although not considered a primary textbook adoption criterion, was very important to some faculty members interviewed. The main reason that publisher representative support post the textbook adoption decision was described as important was that, in the event that academic book retailers did not order sufficient stock of the prescribed textbook, the publishers' representatives can play an important role in securing additional stock. Academic bookstores tend to order fewer prescribed textbooks than the total number of students registered for a course because the bookstores anticipate that some students will buy second-hand copies of the prescribed textbook or might not buy the book at all (Griggs *et al* 2002; Sikorski *et al* 2002). Some faculty want the assurance that the publishers' representatives will be available after the adoption to make sure that their adopted book is readily available to all students registering for the course. The

publisher's representative can help ensure that the adopted book is available to students by "arranging special freighting by air of the books into the country" (Faculty of Humanities, University of Johannesburg).

4.3 Research Question Two

Does supplementary digital textbook content generally influence textbook adoption decisions made at public universities in South Africa?

Despite the fact that nearly 80% of faculty members interviewed believed that supplementary digital textbook content would become more important to textbook adoption decisions made at their institutions in the future, nearly 54% of respondents indicated that they did *not* feel that supplementary digital textbook content *currently* influenced their textbook adoption decisions. Considering that only two faculty members interviewed spontaneously identified supplementary digital textbook content as being an important textbook adoption criterion in response to the first research question, it is interesting that nearly 42% of faculty members indicated that supplementary digital textbook content *did* generally influence textbook their adoption decisions. Clearly, for most of these faculty members, while supplementary digital textbook content did have a general influence on their textbook adoption decisions, it was not an *important* influence for them here. Four percent of faculty members interviewed indicated that they were unsure whether or not supplementary digital textbook content had a general influence on their textbook adoption decisions.

The percentage of faculty members that felt supplementary digital textbook content did generally influence their textbook adoption decisions varied across the four faculties in the study, as shown in Figure 4.

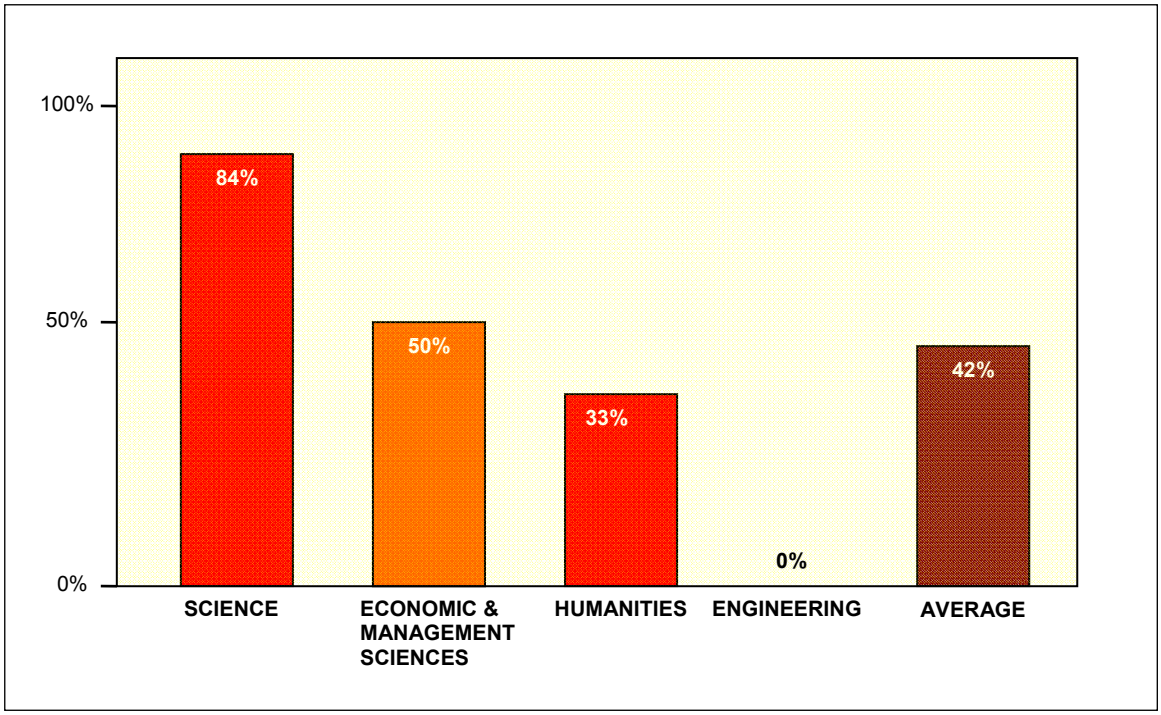


Figure 4. Percentage of respondents by faculty indicating supplementary digital textbook content had a general influence their textbook adoption decisions

The Faculty of Science had the highest percentage (84%) of respondents that believed supplementary digital textbook content did influence their textbook adoption decisions. Given the quantitative nature of most science disciplines and the value of practice exercises and problem solving in teaching the sciences, it is reasonable that supplementary digital textbook content would be *more* influential in this faculty. Similarly, given the more qualitative nature of most disciplines within the Faculty of Humanities and the lower emphasis placed on multiple choice questions by this faculty (as was indicated by respondents in the study), it is not unexpected that supplementary digital textbook content is *less* influential on textbook adoption decisions within this faculty.

What is a surprising result from the research, however, is that *none* of the respondents in the Faculty of Engineering considered supplementary digital textbook content an influence on textbook adoption decisions made in their faculty. The teaching of engineering is largely quantitative in nature with

practice exercises and problem solving almost as widely used as pedagogic tools as they are in the teaching of sciences. What is also interestingly is that as much as 50% of the engineering faculty interviewed indicated that, while supplementary digital textbook content did not *currently* influence their textbook adoption decisions, digital content was growing in importance for the faculty and these respondents expected supplementary digital textbook content to have a greater influence on their textbook adoption decisions in the future. For example, a respondent in the Faculty of Engineering at Wits University said that supplementary digital textbook content "definitely had the potential to influence textbook adoptions" in his faculty and a respondent in the Faculty of Engineering at the University of Johannesburg indicated that the faculty needed to "move in this direction". This view that supplementary digital textbook content was growing in importance as a criterion in textbook adoption decisions is supported by studies in the literature, especially in the more recent research studies (Smith and De Ridder 1997; Altman *et al* 2006; Clow *et al* 2007; Stevens *et al* 2007).

One of the reasons given by respondents for supplementary digital textbook content *not* influencing textbook adoption decisions was that this content had largely become a standard feature with textbooks, especially introductory textbooks, thus having less of an impact on textbook selection. Other faculty felt that the printed content of the textbook was what was important and that supplementary digital textbook content was "simply a nice-to-have" (Faculty of Economic and Management Sciences, University of Johannesburg). For these faculty members supplementary digital textbook content was no more than an additional feature in the modern textbook package and was not considered core to the textbook adoption decision itself. As one faculty member in the School of Civil and Environmental Engineering at Wits University put it: "The content of the book itself will always be more important than what CD is pasted in the back of the book".

However, some faculty members indicated that supplementary digital textbook content not only influenced their textbook adoption decisions but they indicated

that they would not consider adopting a textbook that did *not* include supplementary digital textbook content. For these faculty members the supplementary digital textbook content was core to the textbook product offering. An example of this was in the case of electronic test banks of multiple-choice questions that some respondents indicated they had come to rely on. As one respondent from the Faculty of Humanities at the University of Johannesburg described it: “If no textbook that comes with digital test banks is available we will be forced to create our own test banks”.

4.4 Research Question Three

What are the categories of supplementary digital content most valued by faculty members making textbook adoption decisions at public universities in South Africa?

From the list of the twelve categories of supplementary digital textbook content used in this study and presented to faculty members interviewed, respondents were asked to rank the top three categories of supplementary digital textbook content that they considered to be the most valuable. These three categories were then given a weighted overall score:

Score = 3 if rated most valuable category
Score = 2 if rated second most valuable category
Score = 1 if rated third most valuable category

The categories of supplementary digital textbook content as ranked in terms of value to the twenty-four faculty members interviewed in the study are presented in Table 6 on the following page.

Table 6. Categories of supplementary digital textbook content considered most valuable by all respondents in the study

RANK	SUPPLEMENTARY DIGITAL TEXTBOOK CONTENT	WEIGHTED SCORE
1	Publisher presentation slides	25
2	Video clips, video demonstrations and video case studies	19
3	Digital instructor manual & teaching notes	18
4	Practice exercises for students	17
5	Electronic test banks	15
6	Supplementary audio files, such as interviews with experts in the field of study	5
7	Self-assessment tools	3
8	Chapter summaries	1
8	Electronic versions of the textbook	1
10	Student study plans	0
10	Personal development plans	0
10	Audio files such as MP3 revision notes & chapter summaries	0

As illustrated in Figure 5, the top five categories found in the research study correlate to eight of the nine supplementary digital categories identified by Stevens *et al* (2007) and Clow *et al* (2007). The only category from the literature studies not correlated to the top five categories identified in this research study

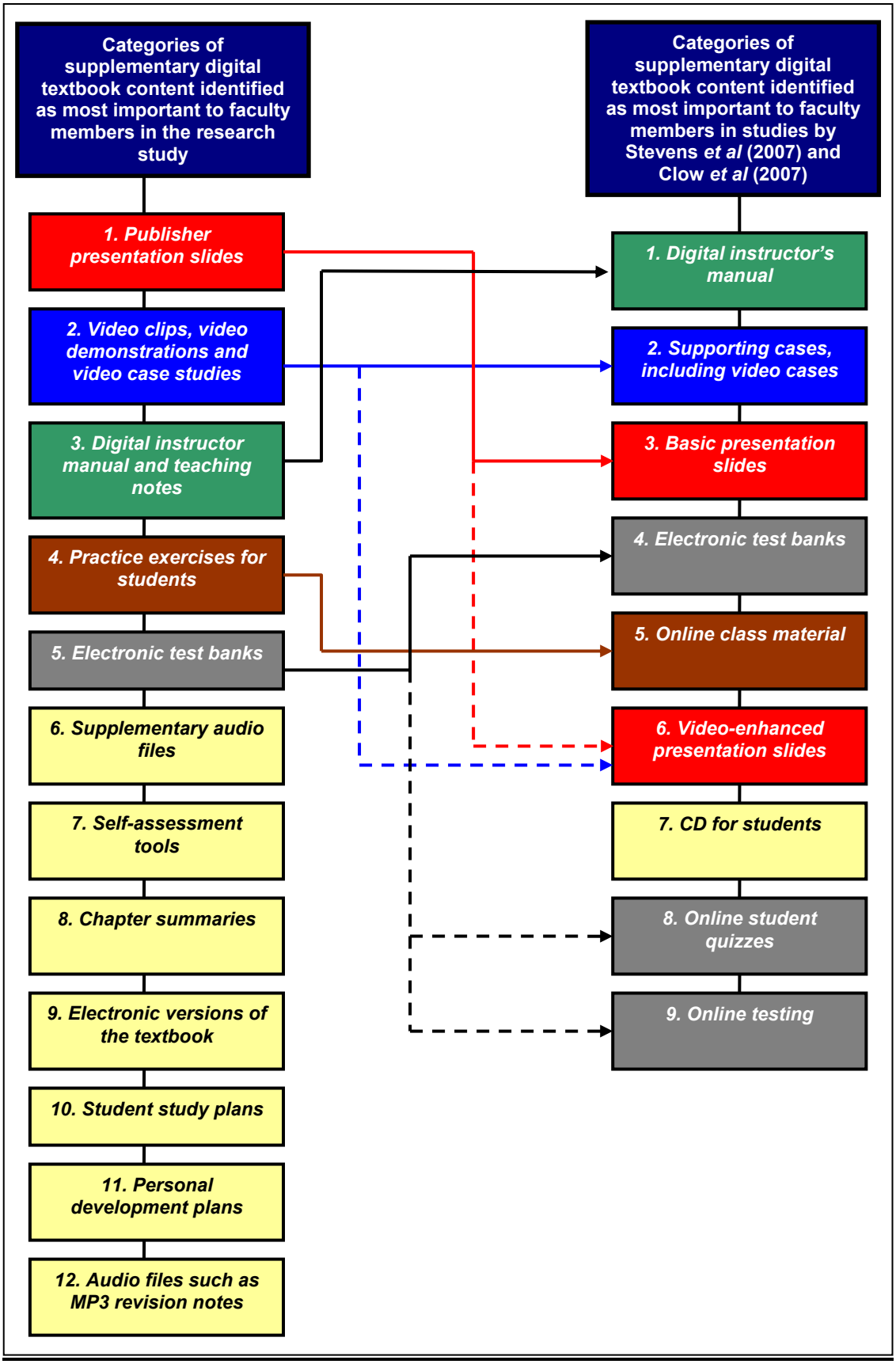


Figure 5. Comparison of top categories of supplementary content identified in the research study with those identified by Sevens *et al* (2007) and Clow *et al* (2007)

is the category *CD for students,* ranked 7th, which is more of a medium supporting supplementary digital textbook content than a supplementary pedagogic content category of its own.

Publisher presentation slides, the category identified as most important in the research study, correlates with *Basic presentation slides* (ranked 3rd) and *Video-enhanced presentation slides* (ranked 6th). The second most important category in the research study, *Video clips, video demonstrations and video case studies*, correlates with *Supporting cases, including video cases* (also ranked 2nd) and *Video-enhanced presentation slides* (ranked 6th). Similarly, *Digital instructor manual and teaching notes*, ranked third in the research study, correlates with *Digital instructor's manual*, the top category identified in the two studies in the literature. The fourth category in the research study, *Practice exercises for students*, correlates with *Online class material* (ranked 5th), while the fifth category of supplementary digital content identified in the research study correlates to three categories from the two 2007 studies: *Electronic test banks* (ranked 4th), *Online student quizzes* (ranked 8th) and *Online testing* (ranked 9th). It can thus be seen that the categories of supplementary digital content identified as most valued by faculty interviewed in this research study are consistent with the results of the two recent studies by Stevens *et al* (2007) and Clow *et al* (2007) as detailed in the literature.

4.4.1 Publisher presentation slides

Classroom instruction tools such as publisher presentation slides were identified as the most valuable category of supplementary digital textbook content by faculty interviewed with an overall weighted average score of twenty-five. The Faculty of Science and the Faculty of Economic and Management Sciences both considered publisher presentation slides the most valuable form of supplementary digital textbook content (Tables 7 and 8), while the Faculty of Engineering and the Faculty of Humanities rated *publisher presentation slides* as the third most valued category (Tables 9 and 10).

Table 7. Categories of supplementary digital textbook content considered most valuable by respondents in the Faculty of Science

RANK	SUPPLEMENTARY DIGITAL TEXTBOOK CONTENT	WEIGHTED SCORE
1	Publisher presentation slides	12
2	Digital instructor manual & teaching notes	7
3	Practice exercises for students	5
4	Electronic test banks	3
5	Video clips, video demonstrations and video case studies	2
6	Electronic versions of the textbook	1
6	Chapter summaries	0
6	Self-assessment tools	0
6	Supplementary audio files, such as interviews with experts in the field of study	0
6	Student study plans	0
6	Personal development plans	0
6	Audio files such as MP3 revision notes & chapter summaries	0

Table 8. Categories of supplementary digital textbook content considered most valuable by respondents in the Faculty of Management and Economic Sciences

RANK	SUPPLEMENTARY DIGITAL TEXTBOOK CONTENT	WEIGHTED SCORE
1	Publisher presentation slides	6
2	Electronic test banks	5
3	Digital instructor manual & teaching notes	4
4	Video clips, video demonstrations and video case studies	1
4	Practice exercises for students	1
4	Chapter summaries	1
7	Self-assessment tools	0
7	Instructor manuals & teaching notes	0
7	Supplementary audio files, such as interviews with experts in the field of study	0
7	Electronic versions of the textbook	0
7	Student study plans	0
7	Personal development plans	0
7	Audio files such as MP3 revision notes & chapter summaries	0

Table 9. Categories of supplementary digital textbook content considered most valuable by respondents in the Faculty of Engineering

RANK	SUPPLEMENTARY DIGITAL TEXTBOOK CONTENT	WEIGHTED SCORE
1	Video clips, video demonstrations and video case studies	9
2	Practice exercises for students	8
3	Publisher presentation slides	4
3	Digital instructor manual & teaching notes	4
5	Self-assessment tools	2
6	Electronic test banks	0
6	Supplementary audio files, such as interviews with experts in the field of study	0
8	Chapter summaries	0
8	Electronic versions of the textbook	0
8	Student study plans	0
8	Personal development plans	0
8	Audio files such as MP3 revision notes & chapter summaries	0

Table 10. Categories of supplementary digital textbook content considered most valuable by respondents in the Faculty of Humanities

RANK	SUPPLEMENTARY DIGITAL TEXTBOOK CONTENT	WEIGHTED SCORE
1	Video clips, video demonstrations and video case studies	7
1	Electronic test banks	7
3	Publisher presentation slides	3
3	Digital instructor manual & teaching notes	3
3	Practice exercises for students	3
6	Self-assessment tools	1
7	Supplementary audio files, such as interviews with experts in the field of study	0
7	Chapter summaries	0
7	Electronic versions of the textbook	0
7	Student study plans	0
7	Personal development plans	0
7	Audio files such as MP3 revision notes & chapter summaries	0

Publisher presentation slides were valued primarily because they saved class teaching preparation time. This was considered especial important with new editions of textbooks being supplied by higher education publishers with increasing frequency, as supported by studies in the literature (Fairchild 2003; Rube 2005; Stevens *et al* 2007). If new editions of the textbook are supplied with publisher presentation slides, then the instructor has basic presentation slides already designed around the new edition's content structure and from which the faculty member can develop their own presentation slides.

Most faculty members that used publisher presentation slides reported first adapting them to their own teaching style. Faculty generally used the publisher presentation slides as a base to which they then added their own materials - such as "jpegs of pictures, diagrams, and scanned material from current journals of chemical education" (Faculty of Science, University of Johannesburg). A reason given by faculty for adapting the publisher's slides was that the course taught did not necessarily follow the structure of the textbook. There was also the need to update some of the textbook content for the classroom, especially if a North American textbook needed to be contextualised for a South African learning content.

Many faculty members indicated that, while publisher presentation slides were valued, they were not used exclusively in classroom instruction but were instead used in conjunction with overhead transparencies and a blackboard or whiteboard. Some faculty reported preferring to use their own slides that were not based at all on those supplied by the publisher. One reason given for this was a belief that the lecturer should present something different to students in the classroom than to what was in the textbook, or students may see little value in either attending classes or buying the textbook.

The School of Economics within the Faculty of Economic & Management Sciences at Wits University reported relying heavily on the publisher's presentation slides and used them with little adaptation. They had a very specific reason for using this approach. With nearly 2000 first-year students in

four economics classes of approximately 500 students each, the school required consistency in how the course material was presented to students as well as in the pace at which the course material was taught. This was because it was common for students to migrate between the four classes. Publisher presentation slides therefore acted as a useful resource for the school and supplementary digital textbook content had become an important criterion in textbook selections made by the School of Economics at Wits University.

4.4.2 Video clips, video demonstrations and video case studies

The second category of supplementary digital textbook content most valued by all faculty members interviewed was *Video clips, video demonstrations and video case studies*, with a weighted average score of nineteen. The Faculty of Engineering and the Faculty of Humanities both considered this the most valuable category of all supplementary digital textbook content (Tables 9 and 10), while the Faculty of Economic and Management Sciences rated it fourth (Table 8) and the Faculty of Sciences rated it fifth (Table 7).

While many faculty interviewed could see the value in using video clips in the classroom, this category of supplementary digital textbook content was less valued than the category of *Publisher presentation slides*. One of the reasons given by faculty for this was a lack of sufficient classroom contact time to allow for the showing of videos in classes. This restriction was described as especially important in the case of first-year undergraduate classes with considerable core course content that needs to be covered by the instructor. As one faculty member from the Faculty of Economic and Management Sciences at the University of Johannesburg put it:

> "The current ninety minute contact sessions are just enough to get through the core course content. With undergraduates the pressure is to ensure that all core content is covered with the students."

Many first-year students entering public universities in South Africa are from previously disadvantaged backgrounds and were described by respondents as often being underprepared for university-level course work. This implies that even more time is required by first-year instructors to get through the prescribed course content and which was “a restriction to using video content in the classroom” (Faculty of Economic and Management Sciences, University of Johannesburg).

However, other respondents did not consider the use of supplementary digital textbook content in the classroom as consuming valuable student contact time. Video clips, video demonstrations and video cases were rather seen as useful in illustrating and reinforcing core course content for students. In the Department of Anthropology and Development Studies at the University of Johannesburg, for example, video clips were described as a useful way to present a subject such as evolution, which some students were described as finding threatening, while “in the subject of linguistic anthropology students in class use video to transcribe body language and language, so video is a big part of what we do” (Faculty of Humanities, University of Johannesburg). Also, with more advanced students such as honours students, it was felt that there was more flexibility in the use of video clips and video case studies because of more time being available in classes which have less pressure to complete required core course material before the students proceeded to more advanced classes.

Some faculty reported using video clips, video demonstrations and video case studies in their classes - but not necessarily those supplied with the adopted textbook. Other sources for this supplementary digital content referred to in the interviews included documentary segments from TV channels such as the Discovery Channel, commercially available DVDs, subject-related websites with video content available online as well as content supplied by industry associations.

4.4.3 Digital instructor manual and teaching notes

The third category of supplementary digital textbook content most valued by faculty interviewed was digital instructor manual and teaching notes, with a weighted average score of 18. This was consistently rated as third most valued category of supplementary digital textbook content across all four faculties, with the exception of the Faculty of Science which rated it second most valued (Table 7).

4.4.4 Practice exercises for students

The fourth category of supplementary digital content most valued by faculty interviewed was practice exercises for students, with a weighted average score of 17. The Faculty of Engineering rated this category second most valued (Table 9) while both the Faculty of Humanities and the Faculty of Science rated it third most valued (Tables 7 and 10). The Faculty of Economic and Management Science rated it fourth most valued (Table 8).

Despite the fact that little is known on how and whether students use the supplementary digital content supplied with textbooks (Thompson 2005), it was widely felt by faculty interviewed that unless supplementary digital exercises were actively prescribed courses most students were unlikely to voluntarily complete them. “The majority of our students don’t do the tutorials made available on *EduLink* [course management system used at the University of Johannesburg] so they are unlikely to complete the supplementary digital exercises supplied with the textbook” (Faculty of Economic and Management Sciences, University of Johannesburg). This finding is supported by the literature where it is argued that supplementary digital textbook content must be prescribed for courses rather than being treated as optional for students to be likely to complete it (Marek *et al* 1999; Gurung 2004; Dickson *et al* 2005).

Other faculty indicated that prescribing supplementary digital content supplied with the textbook was not necessary because the exercises provided in the

printed textbook were considered sufficient. A faculty member in the School of Mechanical Engineering in the Faculty of Science at Wits University, for example, felt that “the digital exercises may be of some value to students in applying the knowledge – but the printed exercises are more than sufficient”. Some schools, such as the School of Chemistry in the Faculty of Science at Wits University, supplied their students with a comprehensive book of supplementary practice exercises published by the university as part of the course. Another reason that online exercises were not always prescribed for students was that a number of faculty interviewed seemed to see supplementary digital textbook content more as optional and additional content made available to students for further exploration, rather than as valuable pedagogic tools for prescription to students in support of learning the core content of the course.

4.4.5 Electronic test banks

The fifth category of supplementary digital textbook content most valued by faculty interviewed was interactive test banks, with a weighted average score of 15. Interestingly, the Faculty of Engineering rated this category as only sixth most valued (Table 9) while the Faculty of Humanities rated it most valued (Table 10). The Faculty of Economic and Management Science rated it second most valued (Table 8) and the Faculty of Science fourth most valued (Table 7).

In completing the research interviews, three faculty members spontaneously mentioned the importance of electronic test banks in their textbook adoption decisions, before the list of twelve categories of supplementary digital textbook content was presented to them. It appears from the research data that for those faculty members that utilised electronic test banks, some had come to rely on them and would not consider adopting a textbook that did not include this supplementary digital material: “Test banks of multiple choice questions are very useful and I am unlikely to select a textbook that does not include a test bank” (Faculty of Economic and Management Sciences, Wits University). A respondent from the Faculty of Humanities at Wits University also referred to

the faculty's growing reliance on electronic test banks from the publisher: "We do need a substantial test bank to draw on and we do rely heavily on the test banks supplied by the publisher".

While electronic test banks were important, they did not necessarily need to be online, interactive or offer automated grading. What was important to faculty that valued electronic test banks was that these banks of questions saved faculty time in setting and marking multiple choice tests. This was especially the case with large introductory classes, where "multiple-choice exams are used extensively" (Faculty of Economic and Management Sciences, Wits University) and: "It is important with big classes for the lecturer to have access to supplementary digital content, especially test banks that save the lecturer a lot of time" (Faculty of Science, University of Johannesburg). This is supported by the literature where, for example, Colle, Vestewig and Baird (1977) argue that, with large classes of 100 students or more, objectively measured, multiple choice tests can be considered a necessity. In the study by Clow *et al* 2007, it was also found that electronic test banks save faculty time in the preparation of tests for students.

4.5 Research Question Four

What are the benefits from adopting supplementary digital textbook content as perceived by faculty members making textbook adoption decisions at public universities in South Africa?

4.5.1 The use of supplementary digital textbook content should enhance student learning

A majority of faculty interviewed (84%) believed that supplementary digital textbook content had the potential to enhance student learning. This view has support in some research studies (Grove and Zemel 2000; Goolkasian *et al* 2003; Dickson *et al* 2005; Farmer 2006; Hove and Corcoran 2008) while some studies do not support the view that supplementary digital textbook content

enhances student learning (Weiten *et al* 1999; Brothen and Wambach 2001; Gurung 2003, 2004).

One of the reasons that many respondents felt that supplementary digital textbook content should enhance student learning was that the supplementary content offered students the opportunity to work through supplementary material, such as practice exercises, at their own pace. Respondents felt that, since not all students learn in the same manner or at the same speed, supplementary digital textbook content provided useful and multiple learning tools that enabled self-study by students. One respondent described supplementary digital textbook content as an "ongoing tutorial" that has the benefit of being constantly available to students.

Faculty generally felt that the benefits for the students in using supplementary digital textbook content would be improved learning and "a better overall educational experience" (Faculty of Engineering, University of Johannesburg). In the School of Physics in the Faculty of Science at Wits University, electronic practice exercises have been made a prescribed course requirement accounting for 8% - 15% of the overall course mark. This school felt that, for the borderline students, this supplementary digital content requirement could make the difference between passing and failing and "definitely add[ed] to student learning". These electronic practice exercises were developed by the School of Physics and were not those supplied with the introductory physics textbook adopted. However, the prescribed use of these supplementary exercises by the School of Physics reflects the potential of supplementary digital textbook content to enhance student learning, with the respondent indicating in the interview that the school would be willing to incorporate electronic practice exercises provided by the textbook publisher on condition that they met the quality standards of the current supplementary digital content used.

This view on the need for pedagogic quality in the supplementary digital material supplied with textbooks is indicative of a theme that emerged from the research data. A number of faculty expressed the view that the supplementary

digital content supplied with the textbook had to meet required faculty standards before they would be adopted as prescribed material for students. For example, in the Faculty of Humanities at Wits University, the multiple-choice questions that were supplied with the textbook were not used by faculty members because they were seen as "dumbing down" the course material and not sufficiently supporting the development of critical thinking ability in humanities students.

Other faculty felt that, while supplementary digital textbook content had the potential to enhance student learning, the key issue was whether students were willing to use the supplementary digital content in order to obtain this benefit.

> "These tools have the potential to enhance learning – the question is whether the students will actually use them. For first year students it is very difficult to transfer responsibility for learning to the student – they generally expect to be told what to learn and do not look for extra learning opportunities." (Faculty of Science, Wits University).

As discussed in 4.4.4 above, the view that supplementary digital textbook content must be prescribed for courses is strongly supported in the literature (Marek *et al* 1999; Gurung 2004; Dickson *et al* 2005).

4.5.2 The use of supplementary digital textbook content should improve teaching effectiveness

Many faculty members interviewed believed that the use of supplementary digital textbook content should improve the effectiveness of faculty teaching. These respondents believed that supplementary digital textbook content in the classroom enabled demonstration of the practical application of theory through images and video clips while supplementary digital textbook content prescribed for students allowed students to test whether they could apply the theory outside of the formal test situation. The supplementary content was seen as an opportunity to provide some variety for students in the classroom and improve

the overall classroom experience. One respondent from the Faculty of Humanities at Wits University believed that supplementary digital textbook content allowed faculty to include “interactive examples that they otherwise would not be able to…which can create better learning experiences for students”. The view that supplementary digital textbook content should result in more engaged students and more effective teaching by faculty is supported in literature studies (Gurung 2003; Hall and Elliot 2003; Hove and Corcoran 2008).

The use of video in the classroom was seen by respondents as especially beneficial to the effective teaching of course content, notably in the two Faculties of Science included in the study. Video content allows the instructor to relate course content more closely to practice and to provide opportunities to illustrate the application of course knowledge for students (Groves and Zemel 2000). Some science experiments, for example, could easily be demonstrated on video in the classroom, saving on both laboratory costs as well as course contact time. Other examples of course material well suited to illustration by video content in the classroom respondents suggested included the interaction of molecules in teaching chemistry; biological processes such as cell division in teaching biology; demonstrating animated waves in teaching physics and illustrating mining operations in the teaching of mining engineering. In the School of Mining in the Faculty of Engineering the use of presentation slides, video and audio in the classroom was also seen as especially beneficial to teaching students who had not been exposed to actual mines and mining operations.

> “Very often we are talking to students about mining equipment and operations that they have never seen before. It is impossible for us to take 150 students underground on a mine visit. When more students were on bursaries they saw this equipment in their time working on the mines. But this is less the case now. So video content in the classroom is very useful in demonstrating this for students.” (Faculty of Engineering, Wits University).

The School of Marketing in the Faculty of Economic and Management Sciences at Wits University also indicated that using presentation technology in the marketing classroom enhanced student learning. Current radio, TV and online marketing campaigns could be effectively demonstrated in lectures using video clips, audio files and live links to websites.

However, while presentation technology could be very effective as a teaching tool in the classroom, a number of faculty members interviewed felt strongly that it was only a tool for teaching and that it had to be used correctly. There is a danger of using presentation technology, especially presentation slides, to bombard students with too much information. One respondent in the Faculty of Science at Wits University warned that the use of presentation slides by instructors in the classroom could be overdone to the extent that "the lecture becomes a bit like watching television" while another respondent in the Faculty of Science at the University of Johannesburg commented that he had seen "some colleagues *PowerPointing* students to death".

Some respondents also felt that presentation slides did not lend themselves to interactive questioning from students or the presentation of thinking behind what was being taught.

> "Presentation slides tended to depict the outcome of thinking in its completed form. It is far more difficult to show students how the thinking developed and how the connections between ideas actually work if relying only on presentation slides in the classroom." (Faculty of Humanities, Wits University).

Other faculty felt that there was a danger of using presentation slides as, what one respondent in the Faculty Engineering at Wits University described as a "substitute for real teaching". Another respondent in the Faculty of Science at the University of Johannesburg believed that, as useful as presentation slides were in classroom instruction, there "is nothing that can replace using chalk and explaining a problem to a student on a blackboard". Other faculty felt that there

was a danger that students could treat the use of supplementary digital textbook content in the classroom as entertainment – sitting back and watching the images and videos, treating them as diversions rather than as part of core content and learning. The study found that the use of presentation technology in the classroom, while it has the potential to improve faculty teaching effectiveness, also has to be handled correctly and match the teaching style of the instructor to achieve improved teaching effectiveness. This view is supported in the literature where a recent study by Hardin (2007) found that presentation software may enhance the teaching of some instructors but it may also detract from the teaching effectiveness of other faculty members.

4.5.3 The use of supplementary digital textbook content should increase student engagement

One of the benefits to using supplementary digital textbook content is that students tend to respond well to this form of pedagogic material (Nelson 2006; Daniels 2006). Faculty interviewed reported that students increasingly expect the use of audio-visual presentations in classroom instruction and generally respond positively when it is used. Faculty felt that higher education had "been moving this way for some time now" (Faculty of Humanities, Wits University) and respondents expected "potentially a greater demand for more digital content from the students in the future" (Faculty of Science, University of Johannesburg).

Faculty felt that the real benefit of using supplementary digital content in the classroom was that it made the lecture more interesting and better held students' attention. Using video clips in the classroom was considered especially useful in helping to keep students engaged. This view is supported in the literature where a study by Groves and Zemel (2000) found that many faculty members believed that one of the most important benefits of using digital technologies in the classroom was improved student attention and interest.

> "Using video clips in the class is a great way to break the lecture and to keep the students' interest. They tend to have a short attention span. Short educational video clips are an excellent tool to use in the classroom as they give the students a chance to demonstrate their intellectual skills. The discussion can even be started in class and then continued online." (Faculty of Humanities, University of Johannesburg).

Using video clips in the classroom also helped the instructor to cater for both the students that are struggling to grasp the basic material and those more capable students that may become bored if classes progress too slowly. Presenting a video clip in class kept all students engaged and allowed the more advanced students to express their views in the class discussions that followed. This approach was reported to be especially effective in the teaching of first-year psychology classes in the Faculty of Humanities at the University of Johannesburg. These large classes were reported to attract students of varying levels of ability and the use of video clips in the classroom helped the instructor manage these differences in student ability.

Online discussion forums were described as something that many students responded well to, possibly because of the growth in popularity of social networking sites. Faculty saw online discussion forums as a useful platform for keeping in contact with students, monitoring their progress and getting feedback from them on how they were finding the course.

4.5.4 The use of supplementary digital textbook content should save faculty members time

Faculty interviewed were divided on whether supplementary digital textbook content did actually save time for faculty members. Some faculty felt that supplementary digital textbook content did save faculty time through (1) less time being required in preparing presentation slides; (2) by the ability to answer a single student's online question and respond to the entire class online; and (3) through the automatic grading of online tests. Other faculty members, however,

felt that utilising supplementary digital content supplied with a textbook often consumed even more of a faculty member's time than was saved.

Presentation technology was widely seen as potentially saving time for faculty members. Some examples provided by respondents here included that presentation slides supplied with the textbook by the publisher were often indicated as valuable primarily because they saved the instructor classroom teaching preparation time. This was especially the case with new editions of textbooks being supplied by publishers with increasing frequency (Fairchild 2003; Rube 2005; Stevens *et al* 2007). If new editions of the textbook are supplied with publisher presentation slides, then the instructor has basic presentation slides designed around the new edition's structure and content from which to develop their own presentation slides. The use of video content in classes could also save on the need for live demonstrations or experiments in the laboratory saving on student contact time which can be spent covering additional course content. Finally, presentation slides also saved class contact time in that there was "less writing on the board in the classroom." (Faculty of Science, Wits University).

Some faculty found that companion websites saved faculty time because they served to monitor student progress and give feedback to the entire class in one online response to an individual student's problem. This was especially of value in teaching large classes.

> "For large classes the supplementary digital materials definitely save faculty time. It is also impossible to monitor each student's progress in large classes and online activity can provide invaluable feedback here." (Faculty of Science, University of Johannesburg).

However, one of the reasons given by some faculty for not prescribing supplementary digital content for students was the time requirement in dealing with student queries that would result. Faculty felt that students would use online facilities to forward multiple queries to the instructor which would become

very difficult and time-consuming to manage, especially in the teaching of large classes.

In addition to multiple queries from students, implementing online tests and exercises was also felt by some faculty to be time-consuming rather than time-saving.

> "At first year level I have previously prescribed online quizzes as part of their assessment. But this year I decided not to do so for workload reasons." (Faculty of Humanities, University of Johannesburg).

One of the problems described with prescribing online tests and exercises is that they create additional work for the lecturer. While grading of multiple choice questions can be automated, many faculties – especially in the Humanities – are not willing to rely on multiple choice tests only. Paragraph-based written exercises can in theory be graded automatically, but the reality is that there are many students in South Africa for whom English is not a first language and faculty members that have tried to implement the automatic grading of digital submissions by students reported that spelling and grammar errors make this unfeasible. The result is often the manual marking of multiple online submissions that can offset the time saved with test preparation (Clow *et al* 2007).

4.6 Research Question Five

What are the barriers to adopting supplementary digital textbook content as perceived by faculty members making textbook adoption decisions at public universities in South Africa?

4.6.1 Lack of classroom facilities and institutional support

Groves and Zemel (2000) found that equipment availability was the single most important factor influencing the adoption of technology by faculty members.

Many faculty at both institutions in the study reported that, although audio-visual facilities were not available in all classrooms, classroom facilities were not considered a general constraint in using supplementary digital textbook content. Where audio visual facilities were not available in a classroom faculty reported either booking a classroom with these facilities or, for smaller post-graduate classes, using portable data projectors. None of the faculty members interviewed considered a lack of institutional technical support as a barrier to using supplementary digital content in the classroom, as both Wits University and the University of Johannesburg have established technical support departments and both institutions have computer laboratory facilities for students. Respondents also indicated that both institutions actively supported the use of technology and course management system platforms by faculty members. The University of Johannesburg has a customised course management system named *EduLink*, while Wits University employs *WebCT* as its course management system. The *Teaching and Learning* divisions of both institutions actively encourage faculty members to utilise these course management systems although the University of Johannesburg appears further advanced in this than Wits University. As identified in the literature review, such institutional support at an organisational level is important in the adoption of a technological innovation by faculty members at a university (Medlin 2001; Hall and Elliot 2003).

4.6.2 Lack of faculty technical skills

Studies in the literature indicate that faculty members may lack the technical skills and understanding needed to use technology in their teaching because they have had little instruction in its use (Turner 2006; Clow *et al* 2007). Faculty have identified training on how to use supplementary digital material as a very important factor in their adoption of new technologies in the classroom (Groves and Zemel 2000). Faculty may also not fully appreciate all the benefits of using supplementary digital content in their classrooms and courses and there may be a need in this regard for greater education and training on the benefits and use

of supplementary digital content by higher education publishers (Groves and Zemel 2000; Nelson 2006).

However, in response to the question of whether there was a need for greater education and training of faculty members on the use and benefits of supplementary digital textbook content, only 54% of faculty members agreed; 29% disagreed and 17% were unsure.

Faculty members who supported the need for more education and training in the use of supplementary digital textbook content indicated that little training had been supplied to them on using information technology in teaching and learning by either the publishers or internal divisions within the university. As a result, the use of these technologies across the universities was described as being very uneven. These respondents felt that supplementary digital textbook content was not always easy to use and that faculty would benefit from both training on using the supplementary material and ongoing support of the supplementary content by publishers.

> "The publishers could actually put their money where their mouths are and do more in educating both faculty and students on the use and benefits of the supplementary content. Academics don't necessarily pick up on these things – the benefits need to be demonstrated to them." (Faculty of Humanities, Wits University).

The more complex an innovation is for potential adopters to understand and use the slower the expected rate of adoption (Boone and Kurtz 1989; Rogers 2003). For faculty members that find supplementary digital textbook content difficult to use, education and training has the potential to reduce this complexity and increase the rate of adoption of the supplementary content by faculty members.

On the other hand, 29% of respondents believed that there was not a need for greater education and training on the use and benefits of supplementary digital textbook content. The faculty that least felt that there was this need was the

Faculty of Humanities where 84% of respondents responded negatively to this question on education and training. Some faculty members felt that their colleagues might find it “insulting” if told they needed training on the use of supplementary digital textbook content, which was not considered that difficult or complex to use. The use of supplementary digital content was perceived as largely intuitive and training on using it may well be “resented” (Faculty of Science, Wits University). Other faculty felt that the publishers were not the right people to do such training and that this would be better done by the institution’s own internal e-learning specialists. It was also felt that faculty members may be reluctant to commit the time required for such training and even some of the faculty members that supported the need for such training stated that faculty members may be unwilling to make the time available for such training.

> “Yes, there is a need for training of faculty on the use of the supplementary content. But publishers would have to do [the training] before lectures start in January. It would be valuable, but finding the time around lectures may be a problem.” (Faculty of Economics and Management Sciences, Wits University).

The key issue on the need for training seemed to be whether or not the faculty member interviewed considered supplementary digital textbook content easy or difficult to use. For those that considered the supplementary content relatively complex, training on its use was generally considered valuable, subject to faculty member time constraints.

4.6.3 Lack of understanding by faculty of the benefits of supplementary digital textbook content

The degree to which an innovation’s benefits and superiority over earlier technologies can be communicated and demonstrated increases the potential rate of adoption of the new technology (Boone and Kurtz 1989). Publishers’ sales representatives can enhance the adoption of supplementary digital content supplied with their textbooks submitted for adoption by actively

demonstrating and explaining to faculty the advantages of using this supplementary content on their courses (Porter 1985; Morris and Morris 1990).

On the question of whether faculty members felt that the benefits of supplementary digital textbook content were being effectively communicated to them by publishers' sales representatives, half the respondents believed that this was not the case: 33% responded yes; 50% responded no; and 17% were unsure. For those respondents that did not believe that the benefits of the supplementary content were being effectively communicated by publishers' representatives, the primary reason given was that the representatives were instead focusing on the textbook's content and the changes made to new editions submitted.

> "No, they rely more on the content and the presentation of the book itself. I think they feel that most of us still look at this as a primary indicator of whether we should go for the textbook or not. Usually the supplementary digital content is presented more as a carrot at the end of the presentation - as an additional benefit." (Faculty of Humanities, Wits University).

This focus by publisher representatives on textbook content is understandable given the importance placed by faculty on textbook content in making their textbook adoption decisions (Morris 1977; Muther 1984; Smith and De Ridder, 1997; Smith and Muller 1998; Altman *et al* 2006; Stevens *et al* 2007; Clow *et al* 2007).

From the research data there appears to be a direct link between the effective presentation of the benefits of supplementary digital textbook content by publisher sales representatives and whether this supplementary content has an influence on the textbook adoption decisions by faculty members. Of the 33% of faculty members that responded positively to the earlier question of whether supplementary digital textbook content generally influences their textbook adoption decisions, as much as 70% also believed that publishers' sales

representatives were effectively communicating the benefits of the supplementary digital textbook content to them. Of the faculty members that indicated that supplementary digital textbook content did not influence their textbook adoption decisions, only 15% also indicated that they felt that the publisher sales representative was effectively communicating the benefits of supplementary digital textbook content in their sales presentations.

The link between effective communication of the benefits of the supplementary digital content by publishers and the influence of supplementary digital textbook content on textbook adoption decisions is also evident at a faculty level. In the Faculty of Science, for example, only one of the six faculty members interviewed across the two institutions in the study felt that supplementary digital textbook content was *not* influencing textbook adoption decisions made within the faculty. This was also the only respondent in the faculty to indicate that she felt publishers' representatives were *not* effectively communicating the benefits of supplementary digital content in their sales presentations.

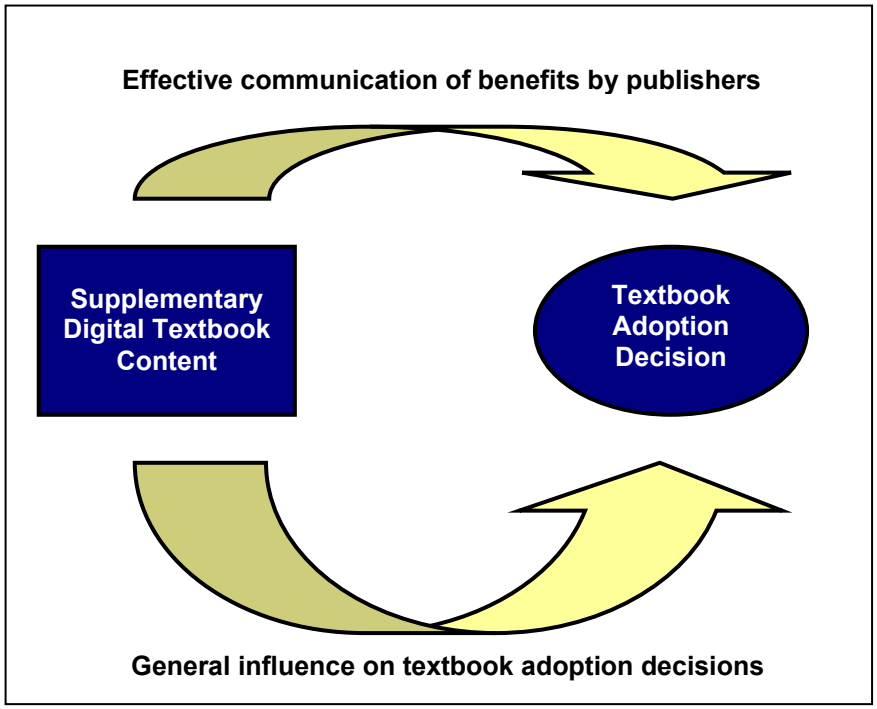


Figure 6. Link between communicating the benefits of supplementary digital textbook content by publishers and the supplementary content's general influence on textbook adoption decisions made by faculty members

All five other respondents in the Faculty of Science believed that publishers' representatives were effectively communicating the benefits of the supplementary digital textbook content *and* that this supplementary content was influencing textbook adoption decisions. Another example is in the Faculty of Engineering where all respondents indicated that the publishers' representatives were *not* effectively communicating the benefits of supplementary digital textbook content and where each respondent also indicated that the supplementary digital textbook content was *not* having an influence on their textbook adoption decisions.

The literature supports the need for higher education publishers to communicate the benefits of a company's offering by employing effective signalling criteria in sales presentations, advertising and promotions. Signaling criteria are important because the buyer may not fully understand all the ways in which a firm's offering might meet their use criteria in lowering their costs or improving their performance (Porter 1985). Faculty members have also indicated in earlier studies that knowing the advantages of a new technology over traditional methods of teaching will influence their potential adoption of the new technology (Groves and Zemel 2000). What may be occurring in the presentation by publishers' representatives of textbooks that include supplementary digital textbook content is that they are only communicating the use and benefits of the supplementary content to those faculty members for whom they believe it is important. So while a faculty member in the study may respond to the question of whether the benefits of supplementary digital textbook content are being effectively communicated by publishers' representatives in sales presentations: "Yes, they know it is important" (Faculty of Humanities, University of Johannesburg), the respondent might also have answered: "Yes, they know it is important *to me.*"

Considering (1) the link between publishers effectively communicating the benefits of supplementary digital textbook content and the influence of this content on the textbook adoption decision evident from the research study and (2) the finding that 80% of respondents believe that supplementary digital

textbook content will become *more* important in their textbook adoption decisions in the future, it is essential that textbook publishing firms do not underestimate the need to clearly signal the value and benefits of supplementary digital textbook content to *all* faculty members and not only to those that are earlier adopters and show a greater interest in the supplementary digital content (Morris & Morris 1990).

4.6.4 Established teaching methods

Hall and Elliot (2003) found that established teaching methods coupled with faculty autonomy could act as a barrier to the adoption of new technologies in teaching and learning. The existence of this barrier was supported by data from the research study. Respondents indicated that there was often faculty inertia to changing established (and even entrenched) teaching methods. A respondent in the Faculty of Science, Wits University described many faculty as preferring to stick to the "tried and tested rather than to explore new tools from publishers". This was a view widely held by faculty interviewed. One respondent, also in the Faculty of Science but at the University of Johannesburg, considered the resistance to change as a matter of additional workload for faculty: "Some faculty are not making the change [to new digital content] because they have their notes and materials already worked out – it is more convenient for them to carry on as they are".

4.6.5 The use of and access to supplementary digital content by students

Only 21% of the faculty members interviewed actively prescribed supplementary digital textbook content for students and in some cases the prescription was limited. In the School of Physics in the Faculty of Science at Wits University, for example, supplementary digital exercises were only prescribed for borderline students requiring extra practice and tuition while in the Department of Economics in the Faculty of Economic and Management Sciences at the University of Johannesburg, supplementary digital textbook content was only prescribed for more advanced students in second year or

higher. The prescribing of supplementary digital textbook content for more advanced students is supported by the study by Marek *et al* (1999) which found that more advanced students would be less receptive to and likely to use the supplementary content, making necessary the prescription of the material by the instructor. Studies in the literature indicate that students are unlikely to use supplementary digital textbook content unless it is prescribed for them to do so (Marek *et al* 1999; Foucault and Scheufele 2002; Gurung 2004; Dickson *et al* 2005; Altman *et al* 2006; Dake 2007). Simply making the supplementary content available to students is unlikely to result in student use of the supplementary digital material (Thompson 2005; Nelson 2006, 2008). The finding in this study that nearly 80% of faculty members interviewed were *not* prescribing supplementary digital textbook content for students implies that most students at the two institutions in the study are unlikely to be using the supplementary digital materials supplied with their prescribed textbooks.

The primary reason given by faculty for not prescribing supplementary digital textbook content for students was that they perceived access by students to online resources to be unequal. Of those respondents that indicated that they did not prescribe supplementary digital content for students, just over 63% cited unequal online access for students as an important reason for their not doing so.

> "Our first year class is around 350 students. Not all these students have internet access. For this reason I wouldn't prescribe the digital content supplied with the textbook. The university does have computer facilities for students but does not have these in sufficient capacity for the very large classes." (Faculty of Humanities, Wits University).

Some faculty members felt that lack of access to the internet would be used by students as "an excuse for not completing prescribed work" (Faculty of Science, University of Johannesburg). Other faculty members distinguished between on-campus and off-campus access to the internet for students.

> "I don't see on-campus access to the internet as a barrier to prescribing supplementary digital content because computer access facilities for students in this faculty are excellent. But I do see off-campus infrastructure as a problem – cost of broadband, speed of connection etc. Many of our students work to support their studies which means that they rely on off-campus access to the internet." (Faculty of Humanities, University of Johannesburg).

Other faculty members interviewed, however, including some of whom did not prescribe supplementary digital textbook content, felt that online access for students was not a barrier to prescribing the supplementary content. Some faculty members indicated that the computer facilities in their own school or department were sufficient to meet the online access needs of students.

> "Access by the students to computer facilities is not a problem. We have an undergraduate and post-graduate computer lab within our school. There are additional campus facilities, students just need to make the effort to use them." (Faculty of Science, Wits University).

Overall, however, unequal student access to online materials is an important barrier to the prescription of supplementary digital textbook content for many faculty identified in the research study. It is also a barrier supported by studies in the literature (Cush and Buskist 1997; Rosenfeld 2006).

4.6.6 The relatively slow adoption of new technologies by faculty

The use of digital content in teaching and learning can be described as a new and emerging technology. One of the best models for understanding the adoption of new and emerging technologies is *Rogers' innovations adoption curve* which shows that new technologies are not adopted equally quickly by all ultimate users. Rather, adoption occurs in stages with more risk-averse users only willing to try the new technology with time as the value of the innovation

becomes more widely recognised (Rogers 1976; Groves and Zemel 2000; Nelson 2006).

In the model adopters can be classified in five categories in terms of the innovativeness of their adoption behaviour as a time-dependent phenomenon, as discussed in the literature (Rogers 1976; Boone and Kurtz 1989; Adcock *et al* 1993). If some categories of adopters are slower in using new and emerging technologies than others, then the category of adopters that the majority of faculty members making textbook adoption decisions falls into will directly affect their adoption of supplementary digital textbook content and its influence on the textbook adoption decision.

In the research study each of the faculty members interviewed were shown a graphic representation of *Rogers' innovations adoption curve* and were asked to identify which of the five categories of adopters they believed faculty members responsible for making textbook adoption decisions in their school or department fell into. This question was asked towards the end of the interview so that the respondent's choice of adoption category did not influence them when answering the questions that followed. Faculty members were also not asked to categorise themselves but rather the faculty members in their school or department so that they did not feel obliged to select an adoption category necessarily consistent with how they had answered the previous interview questions. Some faculty members described themselves as quicker adopters of new technologies than other faculty members in their schools or departments while other faculty members pointed out that it was difficult to generalise on attitudes to new technology in their department as multiple categories of adopters were represented. Younger teaching staff were also described as tending to faster adoption of new technologies than older faculty members.

More than half (54%) of respondents categorised faculty members making textbook adoption decisions within their schools or departments as late-majority adopters. This categorisation was the largest at both Wits University (58%) and at the University of Johannesburg (50%). Across the four faculties surveyed,

late-majority adoption was the largest category in both the Faculty of Humanities (67%) and the Faculty of Engineering (67%). As discussed in the literature review, late-majority adopters are adopters that employ an innovation only after others have already done so, tend to be cautious and sceptical of emerging technologies and often need to be coerced to use new technologies in the classroom (Rogers 1976; Hall and Elliot 2003).

The second-largest adopter category faculty members placed their schools or departments in was the early majority category (30%). This categorisation was the second-largest at both Wits University (26%) and at the University of Johannesburg (34%). Across the four faculties surveyed, the early majority adoption category was largest in the Faculty of Science (50%). However, as early majority adopters seldom hold positions of opinion-leadership in their social systems (Rogers 2003) the relatively high percentage of early-majority adopters in the study does not imply that the 54% of late-majority adopters are being influenced in their adoption of supplementary digital textbook content. Early-majority adopters tend to be more risk-averse than early adopters are but are more willing to experiment and accept change than is the average adopter or late-majority adopter (Rogers 1976; Nelson 2006). Early majority adopters tend to be receptive to new technologies but only after these technologies have been demonstrated to enhance teaching performance or student learning (Hall and Elliot 2003).

Only 8% of faculty interviewed identified their schools or departments as falling into the early adoption category. This was the same percentage across both the University of Johannesburg and Wits University. Early adopters are considered opinion leaders who are open to new ideas (Rogers 1976) and who tend to integrate new technologies into the classroom and teaching process (Hall and Elliot 2003).

Table 11. Self-categorisation of adoptive behaviour by faculty members interviewed in the research study

	INNOVATORS	EARLY ADOPTERS	EARLY MAJORITY	LATE MAJORITY	LAGGARDS
ALL	8%	8%	30%	54%	0%
INSTITUTION					
UJ	8%	8%	34%	50%	0%
Wits	8%	8%	26%	58%	0%
FACULTY					
Economic & Management Sciences	17%	0%	33%	50%	0%
Humanities	0%	33%	0%	67%	0%
Science	17%	0%	50%	33%	0%
Engineering	0%	0%	33%	67%	0%

Similarly, only 8% of faculty interviewed identified their schools or departments as falling into the innovator adoption category. This was the same percentage across both the University of Johannesburg and Wits University. The two faculties where 17% of respondents felt that their schools or departments were innovators were the faculty of Economic and Management Sciences and the Faculty of Science. No respondents in either of the two other faculties in the study believed that textbook adopters in their schools or departments were

innovators. Innovators are considered pioneers in adopting new technologies, are largely able to learn new technologies on their own, tending to push new technologies forward prior to the development of standards (Rogers 1976; Hall and Elliot 2003).

Lastly, none of the respondents identified faculty members making textbook adoption decisions in their schools or departments as falling into the laggards adoption category. Laggards are faculty members who deliberately avoid new ideas and who hold on to traditional approaches to teaching unless forced to adopt new technologies on their courses (Rogers 1976; Hall and Elliot 2003). The fact that no faculty members identified their schools or departments as laggards does not rule out the possibility that faculty members making textbook adoption decisions may well be laggards as it likely that people who are in this category will not self-identify themselves as such. The study by Medlin (2001) which also used Roger's innovation adoption curve categories, for example, found no faculty that self-identified themselves as laggards.

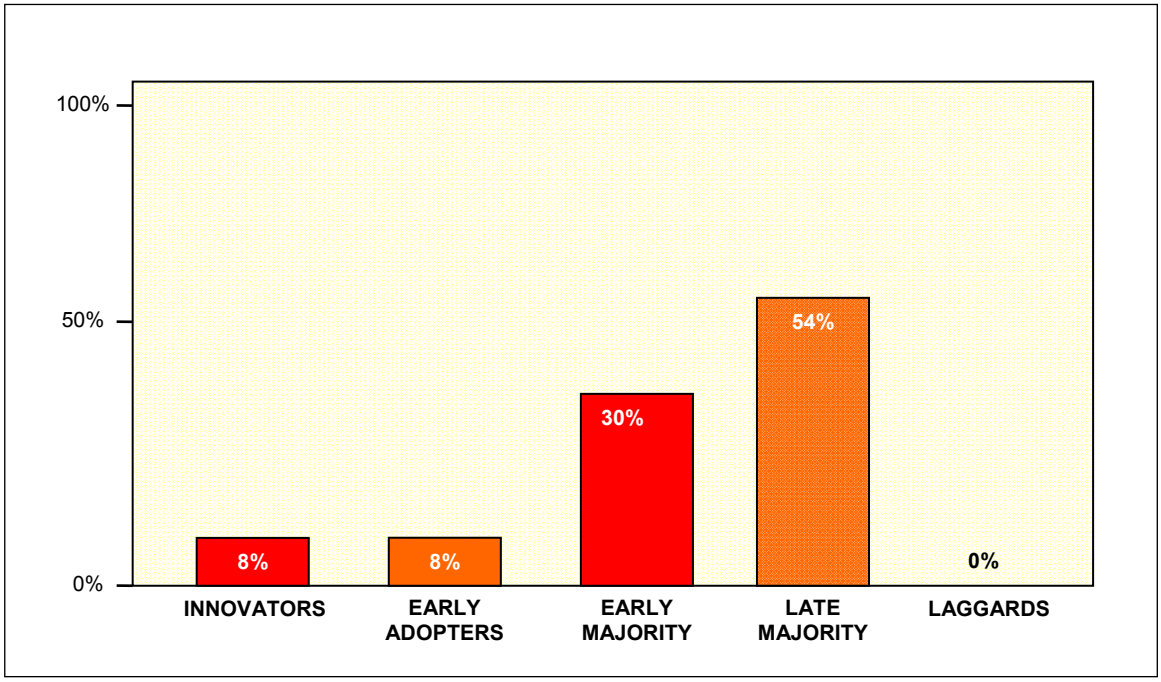


Figure 7. Graph showing self-categorisation of adoptive behaviour by all faculty members interviewed in the research study

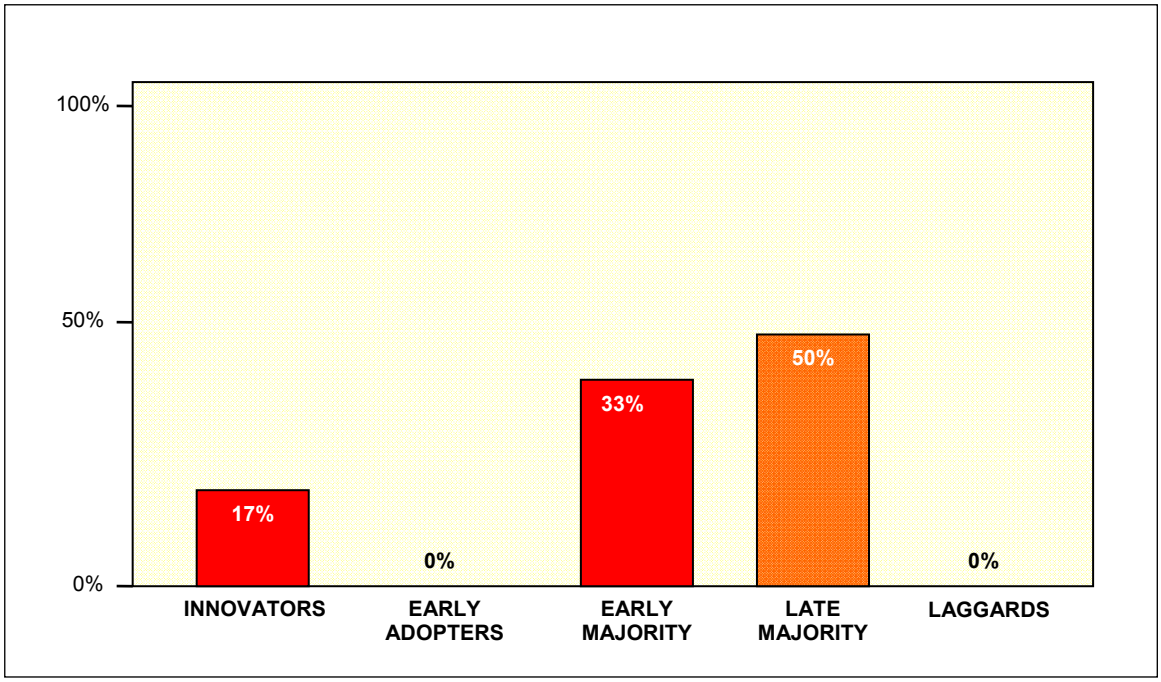


Figure 8. Graph showing self-categorisation of adoptive behaviour by respondents in the Faculty of Economic and Management Sciences

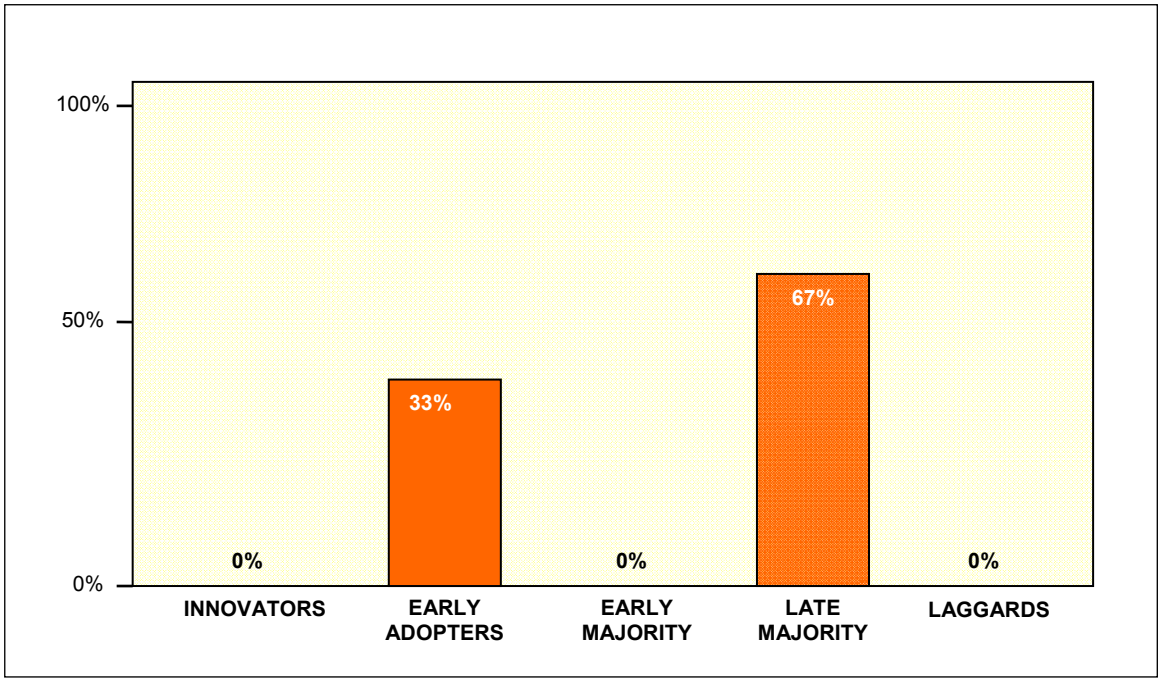


Figure 9. Graph showing self-categorisation of adoptive behaviour by respondents in the Faculty of Humanities

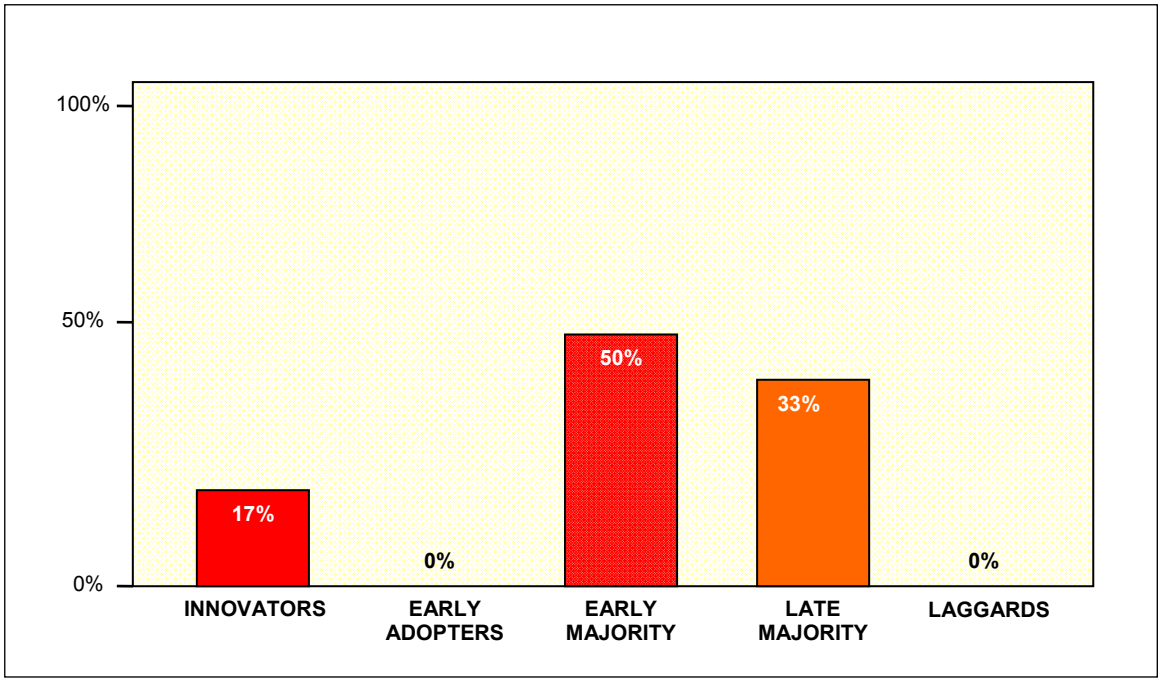


Figure 10. Graph showing self-categorisation of adoptive behaviour by respondents in the Faculty of Science

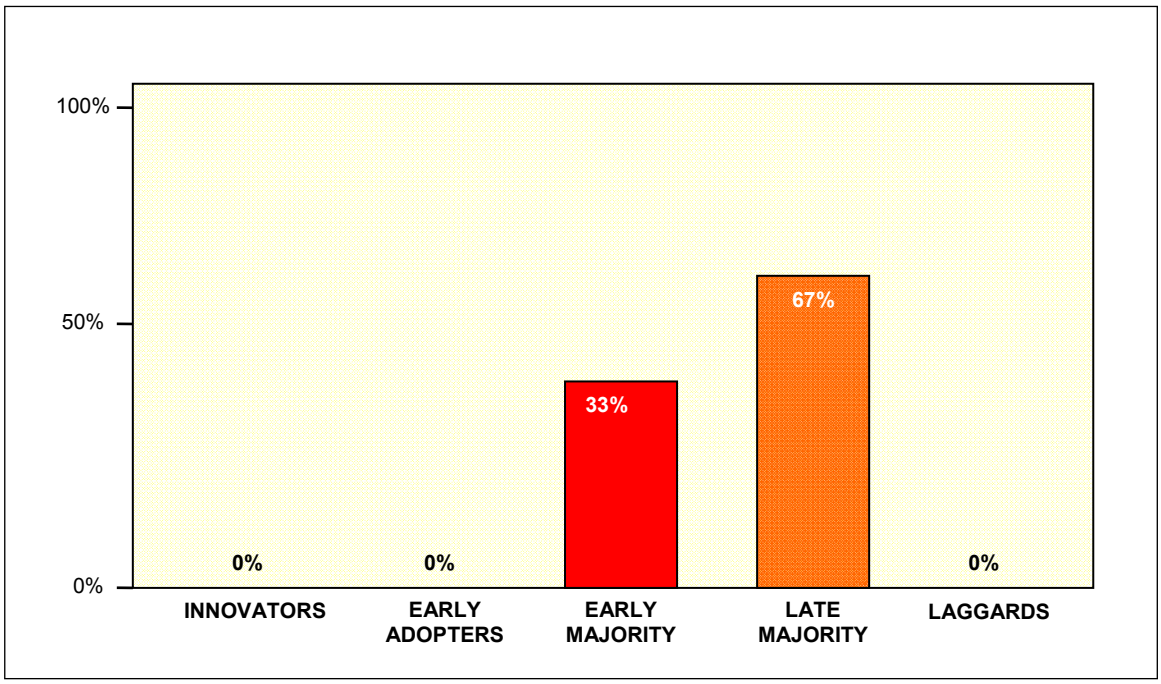


Figure 11. Graph showing self-categorisation of adoptive behaviour by respondents in the Faculty of Engineering

5. CONCLUSIONS AND RECOMMENDATIONS

In this chapter the theory cited in the literature and the findings from the research study are considered in terms of the five research questions.

5.1 Responses to Research Question One

Which textbook adoption criteria are currently being applied in textbook adoption decisions made at public universities in South Africa?

The review of the literature identified six important textbook adoption criteria. These were quality of textbook content; readability and understandability; cost of the textbook to students; good illustrations and examples; the supply of supplementary digital content and the teaching style of the instructor. The textbook adoption criteria identified as important in the literature are illustrated in Figure 12.

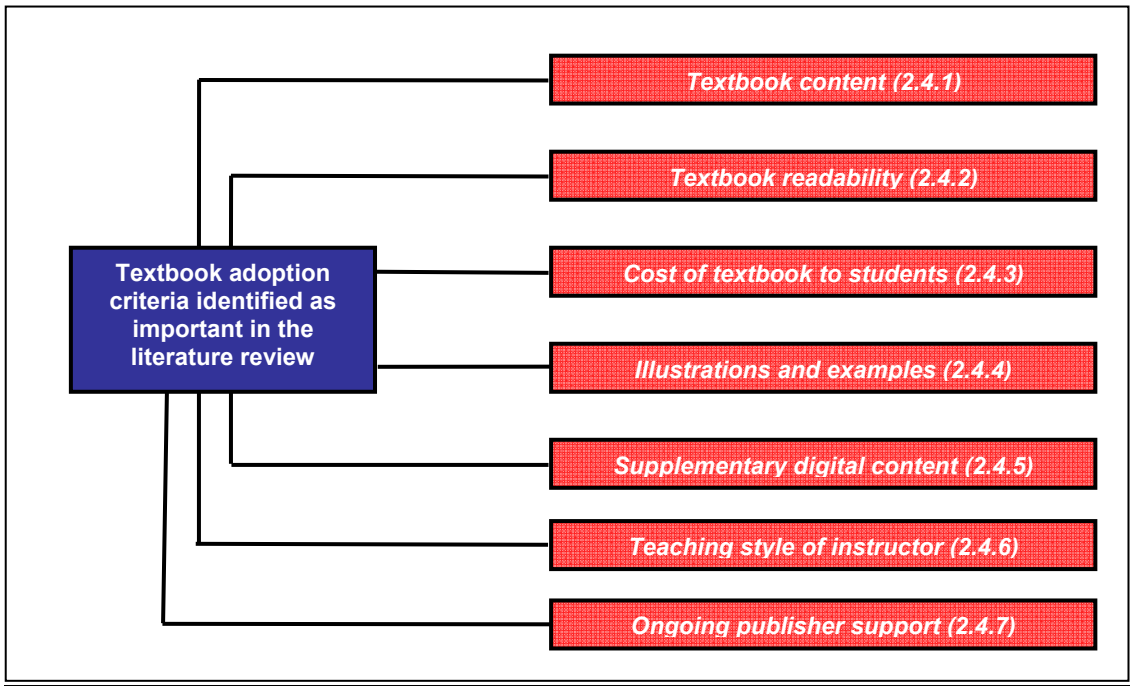


Figure 12. Textbook adoption criteria identified as important in the literature review

Analysis of the data from the research study identified five textbook adoption criteria currently being applied by faculty at the two institutions in the research study. These were: quality of textbook content; readability and understandability; cost of the textbook to students; good illustrations and examples and ongoing support from publishers' representatives. The two criteria that were identified in the literature review but not in the research study were (1) supplementary digital textbook content and (2) the teaching style of the instructor. This is illustrated in Figure 13 below.

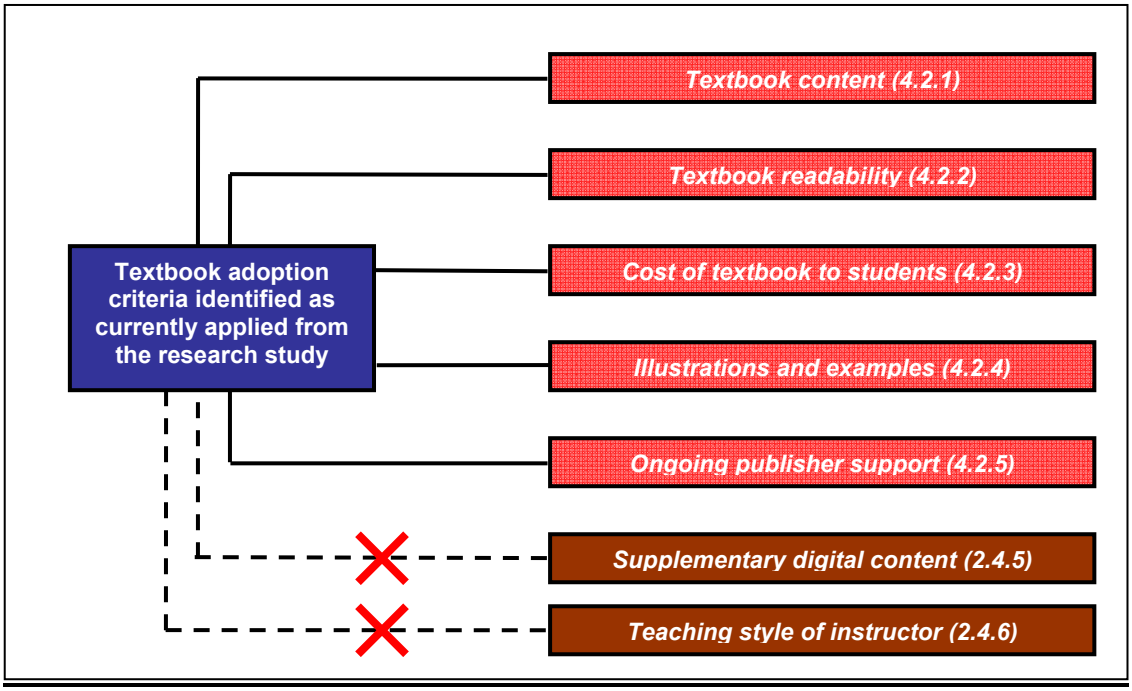


Figure 13. Textbook adoption criteria identified as currently applied in the research study

Only two faculty members interviewed spontaneously identified supplementary digital textbook content as having an influence on their textbook adoption decisions. Both these respondents were from Wits University, one from the Faculty of Science and one from the Faculty of Economic and Management Sciences. The teaching style of the instructor was referred to as a factor in evaluating the content of a textbook (see 4.2.2) but was not a strong enough theme in the data for categorisation as an independent criterion in the analysis.

The one criterion identified by respondents that had only limited support in the literature was the importance of ongoing support from publisher representatives.

5.1.1 Summary of research findings and supporting literature in response to Research Question One

QUALITY OF TEXTBOOK CONTENT	
1. Most respondents (91%) considered the quality of textbook content as an important textbook adoption criterion with 50% of respondents specified quality of textbook content as their *single most important* textbook adoption criterion. 2. Respondents indicated textbook content must match course objectives and curriculum. 3. Respondents indicated textbook content must support faculty's teaching focus and philosophy. 4. Respondent opinions varied on the importance of current and local content in textbook adoptions with opinions varying by faculty, department and school. 5. Respondents indicated that the need for current and local content could be met by the lecturer by providing reading packs and supplementary articles to students. 6. Respondents indicated that the need for current and local content in textbooks is supported by the changing student demography at South African universities. 7. Respondent opinions varied on whether current and local content was more important for introductory or for more advanced course levels in higher education. 8. Respondents indicated that the quality of content in local textbooks needs to at least equal the quality of content of imported books for local textbooks to be considered for adoption.	▪ Morris 1977 ▪ Muther 1984 ▪ Smith and De Ridder 1997 ▪ Smith and Muller 1998 ▪ Landrum and Hormel 2002 ▪ Altman *et al* 2006 ▪ Stevens *et al* 2007 ▪ Clow *et al* 2007 ▪ Prather and Topuz 2007

COST OF TEXTBOOK TO STUDENTS	
1. All respondents (100%) considered the cost of the textbook to students an important textbook adoption criterion. 2. Only one respondent considered cost their *single most important* textbook adoption criterion. For most faculty members cost came second to the quality of textbook content in textbook adoption decisions. However, if the quality of the content was equal between two textbooks most respondents indicated they would adopt the lower-cost textbook. 3. Primary reasons given by respondents for considering cost of the textbook to students as an important criterion were (1) the already high costs of tuition and living for students (2) students were less likely to purchase a more expensive prescribed textbook. 4. Some respondents indicated that they gave preference to local over imported textbooks because local textbooks were perceived to be available at a generally lower cost compared to imported textbooks. 5. Some respondents considered cost of the textbook as a less important textbook adoption criterion because many South African students were on scholarships or bursaries. Other respondents, however, felt that this was not a significant enough factor to diminish the importance of cost in their textbook adoption decisions. 6. Respondents generally believed that publisher representatives were forthcoming with textbook pricing information in textbook sales presentations. 7. Respondents reported they employ various methods to try and keep the cost of textbooks down. These ranged from rationalising the number of textbooks prescribed for a course to using reading packs and articles instead of a prescribed textbook.	▪ Sommer 1980 ▪ Quereshi 1981 ▪ Sommer *et al* 1988 ▪ Griggs *et al* 2002 ▪ Fairchild 2004 ▪ Rube 2005 ▪ Thompson 2005 ▪ Rosenfeld 2006 ▪ Case 2006 ▪ Stevens *et al* 2007 ▪ Clow *et al* 2007 ▪ Drake 2007 ▪ Robinson 2008

READABILITY AND COMPREHENSIBILITY	
1. A majority of respondents (88%) considered readability and comprehensibility an important textbook adoption criterion. 2. Respondents considered readability especially important to textbook adoption decisions because many South African students do not have English as a first (or even second) language. 3. Respondents considered readability less important in adopting textbooks for more quantitative courses, although some faculty interviewed felt readability was just as important for quantitative courses. 4. Respondents considered readability especially important when adopting textbooks for introductory and foundation university courses.	▪ Stang 1975 ▪ Sommer 1980 ▪ Quereshi 1981 ▪ Tyson and Woodward 1989 ▪ Spinks and Wells 1993 ▪ Smith and De Ridder 1997 ▪ Smith and Muller 1998 ▪ Griggs 1999 ▪ Landrum and Hormel 2002 ▪ Dake 2007 ▪ Durwin and Sherman 2008
ILLUSTRATIONS AND EXAMPLES	
1. Respondents (38%) considered good textbook illustrations as an important textbook adoption criterion. 2. Respondents indicated that good graphics, clear artwork, easily understandable diagrams, realistic images and the effective use of colour were all identified as important in evaluating textbook illustrations.	▪ Morris 1977 ▪ Muther 1984 ▪ Smith and Muller 1998 ▪ Landrum and Hormel 2002 ▪ Robinson 2008
SUPPORT FROM PUBLISHERS' REPRESENTATIVES	
1. Respondents (13%) considered ongoing support from publishers' representatives as an important textbook adoption criterion. 2. Respondents indicated that publishers' support was important due to the role publishers play can play in helping ensure that sufficient stock of the prescribed book is made available through booksellers.	▪ Groves and Zemel 2000 ▪ Medlin 2001 ▪ Griggs *et al* 2002 ▪ Sikorski *et al* 2002 ▪ Altman *et al* 2006 ▪ Turner 2006 ▪ Clow *et al* 2007

5.1.2 Conclusions on responses to Research Question One

Respondents in the research study identified five important textbook adoption criteria currently being applied in textbook adoption decisions made at public universities in South Africa. These are:

1. Quality of textbook content
2. Readability of the textbook
3. Cost of the textbook to students
4. Good illustrations and examples
5. Ongoing publisher support

Supplementary digital content and the *teaching style of the instructor*, while identified in the literature review as important textbook adoption criteria, did not emerge as such from the study research data.

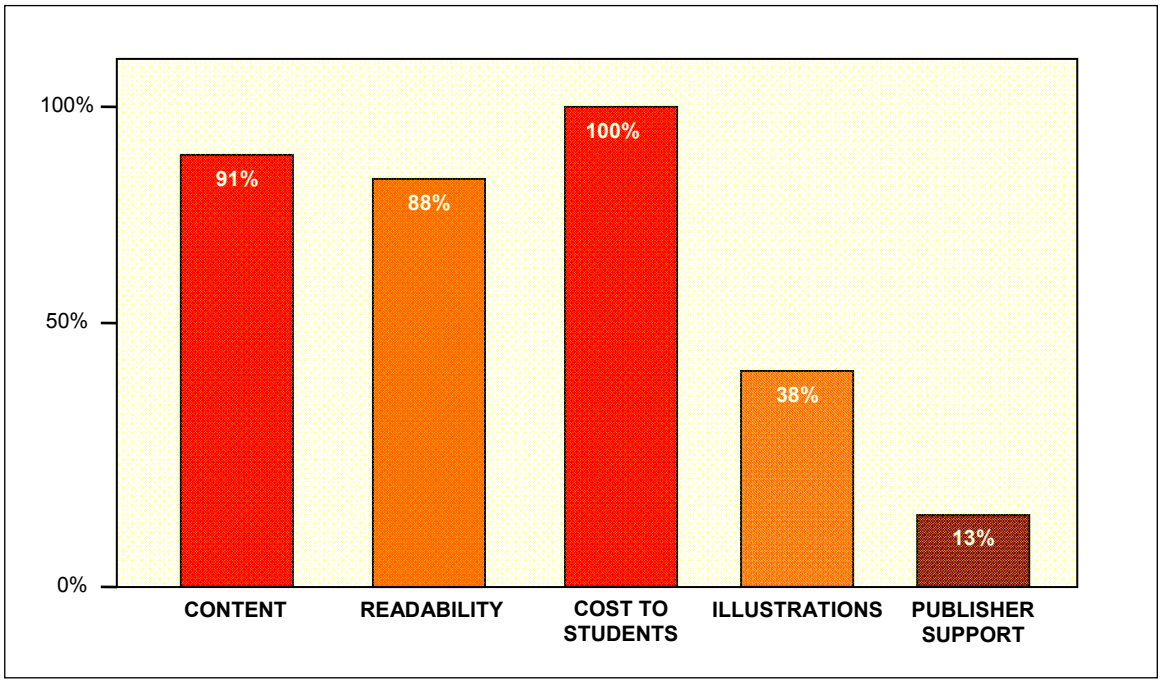


Figure 14. Textbook adoption criteria rated by faculty as important in the study

In terms of which of the five identified criteria is most important in textbook adoption decisions, as illustrated in Figure 5 *Cost of the textbook content to*

students was most widely recognised as an important criterion (100%), followed by *Quality of textbook content* (91%), *Readability of the textbook* (88%), *Good illustrations and examples* (38%) and *Ongoing publisher support* (13%). However, more than half the respondents in the study specified that quality of textbook content was their *single most important* textbook adoption criterion with only one respondent indicating that *cost of the textbook to students* was their single most important criterion.

The conclusion reached in this study is that the five most important textbook adoption criteria being applied at public universities - in order of importance to textbook adopting faculty - are shown in Figure 15 below.

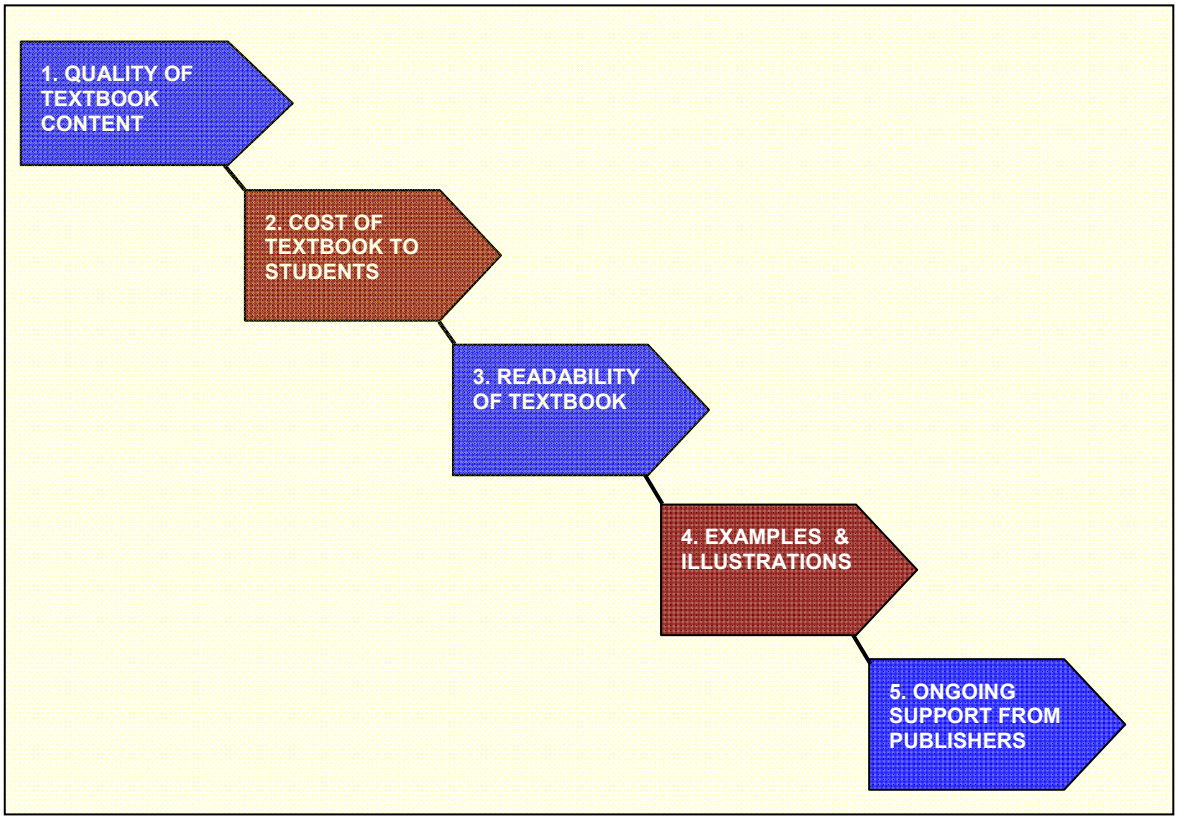


Figure 15. Five most important textbook adoption criteria identified as currently applied at the two institutions in the study

5.2 Responses to Research Question Two

Does supplementary digital textbook content generally influence textbook adoption decisions made at public universities in South Africa?

5.2.1 Summary of research findings and supporting literature in response to Research Question Two

GENERAL INFLUENCE OF SUPPLEMENTARY DIGITAL TEXTBOOK CONTENT	
1. Nearly 54% of respondents indicated that supplementary digital textbook content did not generally influence their textbook adoption decisions. 2. However, 42% of respondents indicated that supplementary digital textbook content did influence their textbook adoption decisions. 3. Given that only two respondents indicated that supplementary digital textbook content was an important textbook adoption criterion in response to research question one, it can be implied that supplementary digital textbook content is not an *important* influence on textbook adoption decisions, even for most of the 42% minority of respondents that indicated the supplementary content did have a *general* influence on their textbook adoption decisions. 4. The percentage of respondents indicating that supplementary digital textbook content influenced their textbook adoption decisions varied by faculty. The faculty with the highest percentage was the Faculty of Science (84%) with the Faculty of Engineering reporting the lowest percentage (0%). However, half the respondents in the Faculty of Engineering did indicate that the importance of supplementary digital textbook content in textbook adoptions made by their faculty was growing.	▪ Smith and De Ridder 1997 ▪ Altman *et al* 2006 ▪ Clow *et al* 2007 ▪ Stevens *et al* 2007

5. Reasons given by respondents for supplementary digital textbook content *not being* an influence on textbook adoption decisions were (1) supplementary digital textbook content increasingly comes standard with textbooks, especially introductory textbooks (2) a number of faculty did not consider supplementary digital textbook content as essential to the textbook product offering but rather as an optional extra. 6. Some respondents did consider supplementary digital textbook content as core or essential to the textbook product offering and indicated that they would not consider adopting a textbook if specific supplementary digital content, such as electronic test banks, was excluded from the bundled textbook offer.	

5.2.2 Conclusions on responses to Research Question Two

The evidence from the research data is not convincing on whether supplementary digital textbook content generally influences textbook adoption decisions made at public universities in South Africa. A slight majority of faculty members (54%) indicated that supplementary digital content does not generally influence their textbook adoption decisions while a slight a slight minority of respondents (42%) indicated that supplementary digital content does generally influence their textbook adoption decisions. The results of the responses to this research question are displayed in Figure 16.

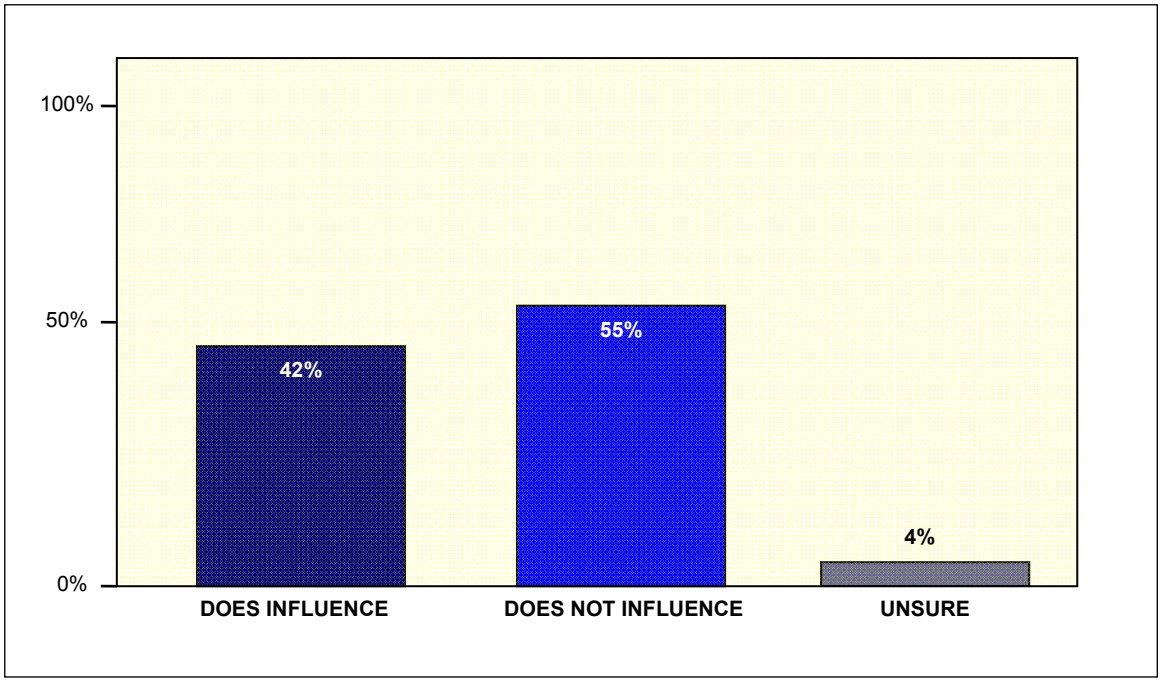


Figure 16. Percentage of faculty members indicating whether supplementary digital textbook content generally influences textbook adoption decisions in their faculty

What can be seen from the research results is that supplementary digital textbook content is more important to textbook adoption decisions made in the Faculty of Science and the Faculty of Economic and Management Sciences. For supplementary digital textbook content to have a stronger general influence on textbook adoption decisions, more faculty members need to perceive the supplementary digital content offered by publishers as core to the overall textbook product offering, rather than as an optional extra.

5.2 Responses to Research Question Three

What are the categories of supplementary digital content most valued by faculty members making textbook adoption decisions at public universities in South Africa?

5.3.1 Summary of research findings and supporting literature in response to Research Question Three

CATEGORIES OF SUPPLEMENTARY DIGITAL TEXTBOOK CONTENT MOST VALUED BY FACULTY MEMBERS	
1. The five categories of supplementary digital textbook content identified as most valued for faculty interviewed in the research study were: 1. Publisher presentation slides 2. Video clips, video demonstrations and video case studies 3. Digital instructor manual and teaching notes 4. Practice exercises for students 5. Electronic test banks 2. These top five categories correlated with eight of the nine supplementary digital categories identified in the studies by Stevens *et al* (2007) and Clow *et al* (2007). 3. Publisher presentation slides were valued primarily because they saved teaching preparation time. This was considered especially important because of the many new editions of textbooks being issued with increased frequency by publishers. 4. Publisher presentation slides are first adapted to the individual instructor's teaching style by many faculty and tended to be used in conjunction with other classroom presentation tools such as overhead projectors and black or white boards.	▪ Colle, Vestewig and Baird 1977 ▪ Porter 1985 ▪ Morris and Morris 1990 ▪ Marek *et al* 1999 ▪ Landrum and Hormel 2002 ▪ Fairchild 2003 ▪ Gurung 2004 ▪ Dickson *et al* 2005 ▪ Rube 2005 ▪ Thompson 2005 ▪ Farmer 2006 ▪ Stevens *et al* 2007 ▪ Clow *et al* 2007 ▪ Makkar *et al* 2008

5. One of the reasons given for video clips, video demonstrations and video case studies being less valued than publisher presentation slides by faculty members is the lack of sufficient classroom contact time to facilitate their use. This was considered a problem especially in the case of first year university classes with the scope of core content that needed to be covered and with some students from previously disadvantaged backgrounds being less prepared for university-level work. Other respondents, however, saw video content as useful in illustrating and reinforcing core course content, especially in advanced student classes which were more flexible.
6. Video clips, video demonstrations and video cases used in the classroom were reportedly not necessarily those being supplied by the publishers with the adopted textbook.
7. The digital instructor manual with teaching notes was rated third most valuable by respondents by three of the four faculties in the study.
8. It was widely felt by faculty interviewed that unless supplementary digital textbook practice exercises were prescribed students would be unlikely to voluntarily complete them. This finding is supported by studies published in the literature.
9. The Faculty of Humanities rated electronic test banks the most valued form of supplementary digital textbook content while some respondents indicated that they would not consider a textbook for adoption if it did not include an electronic test bank.
10. It was found that electronic test banks did not need to be online, interactive or offer automated grading to be valued by faculty members. Faculty interviewed rather valued the time saved in setting multiple choice tests as a benefit offered by electronic test banks.

5.3.2 Conclusions on responses to Research Question Three

Respondents in the study identified twelve categories of supplementary digital textbook as most valuable to them, as illustrated in Figure 17. This ranking of the categories of supplementary digital content most valued by respondents in the study is supported in the literature by the studies conducted by Stevens *et al* (2007) and Clow *et al* (2007).

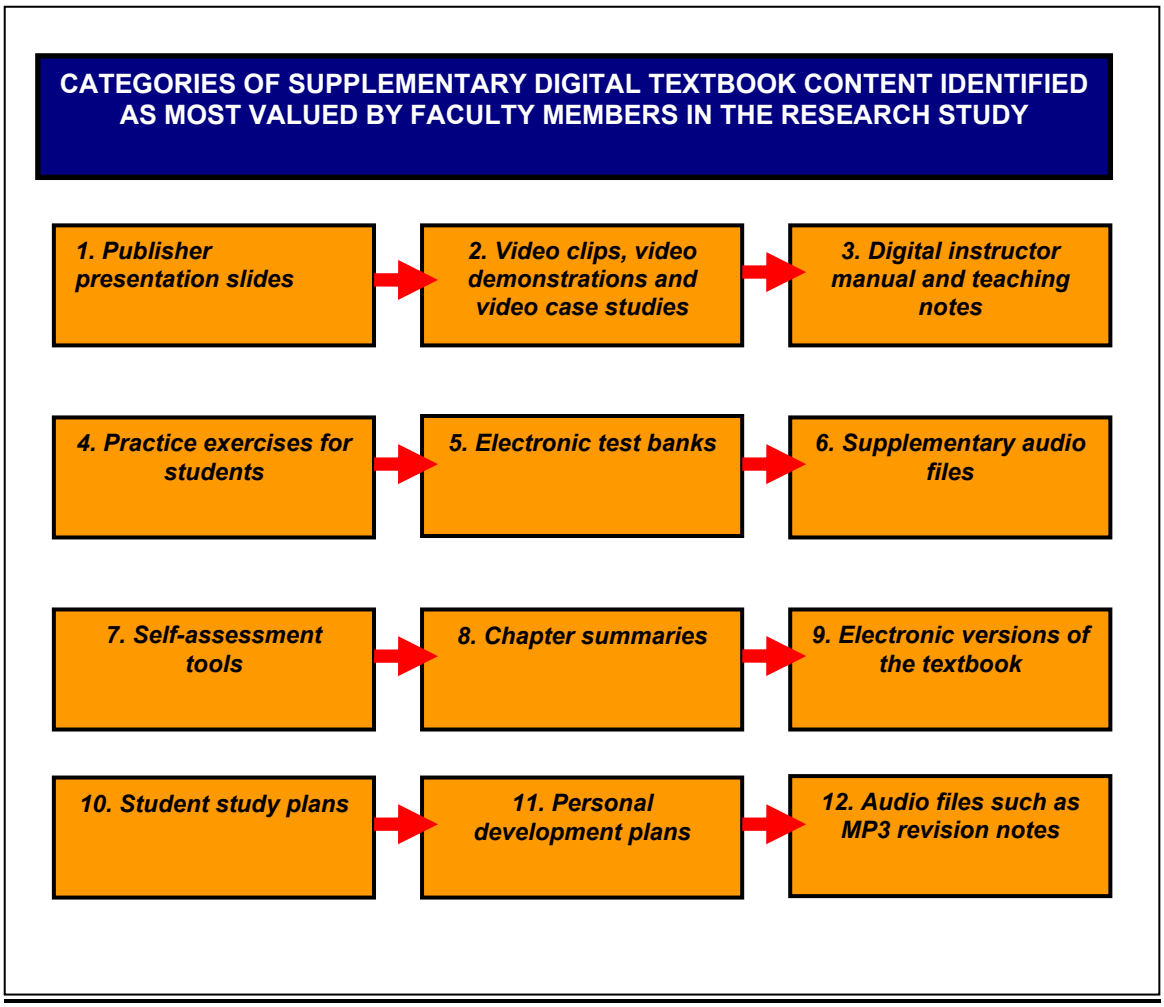


Figure 17. Categories of supplementary digital textbook content identified as most valued by faculty members in the research study

5.4 Responses to Research Question Four

What are the benefits to adopting supplementary digital textbook content as perceived by faculty members making textbook adoption decisions at public universities in South Africa?

5.4.1 Summary of research findings and supporting literature in response to Research Question Four

BENEFITS TO THE ADOPTION OF SUPPLEMENTARY DIGITAL TEXTBOOK CONTENT AS PERCEIVED BY FACULTY MEMBERS	
1. A majority of faculty interviewed (84%) believed that supplementary digital textbook content had the potential to enhance student learning. One of the key reasons given for this view was that supplementary digital textbook content provided multiple learning tools that enabled self-study by students. 2. Faculty indicated that the supplementary digital content supplied by textbook publishers needed to meet pedagogic quality standards before they would consider prescribing it for their courses. 3. Faculty believed that unless supplementary digital content was prescribed for students most were unlikely to complete it. This is a view supported by studies in the literature. 4. Many faculty members believed that the use of supplementary digital textbook content should improve the effectiveness of faculty teaching by introducing variety in the classroom and improving the overall learning experience. 5. Respondents felt that the use of video in the classroom was especially beneficial to teaching effectiveness by allowing the instructor to illustrate the application of knowledge and to relate course materials more closely to practice in the field.	▪ Porter 1985 ▪ Boone and Kurtz 1989 ▪ Marek *et al* 1999 ▪ Weiten *et al* 1999 ▪ Groves and Zemel 2000 ▪ Brothen and Wambach 2001 ▪ Medlin 2001 ▪ Landrum and Hormel 2002 ▪ Fairchild 2003 ▪ Goolkasian *et al* 2003 ▪ Hall and Elliot 2003 ▪ Gurung 2003, 2004 ▪ Rube 2005 ▪ Dickson *et al* 2005 ▪ Farmer 2006 ▪ Nelson 2006, 2008 ▪ Daniels 2006 ▪ Hardin 2007 ▪ Stevens *et al* 2007 ▪ Clow *et al* 2007 ▪ Hove and Corcoran 2008

6. The study found that the use of presentation technology in the classroom, while having the potential to improve faculty teaching effectiveness, also has to be handled correctly and match the teaching style of the instructor for improved teaching effectiveness. Presentation software may enhance the teaching of some instructors but may also detract from the teaching of others, be over-used and act as a substitute for “real teaching”. 7. Many faculty members believed that using supplementary digital textbook content in the classroom improved student attention and interest. This was especially the case with the use of video content in the classroom. Faculty reported that students increasingly expect the use of audio-visual presentations in classroom instruction and generally respond positively when it is used. 8. Faculty interviewed were divided on whether supplementary digital textbook content did actually save time for faculty members. Presentation software was widely seen as potentially saving classroom preparation time for faculty members, especially with the increasing supply of new editions of textbooks by publishers. Companion websites were also seen by respondents as potentially saving time for faculty members by enabling single communications to multiple students. This was considered especially valuable in the teaching of large classes. 9. However, handling multiple queries by students submitted online was seen as potentially very time-consuming for faculty and implementing and managing online tests and exercises was also seen by some faculty members as time-consuming. The reason given here was that the automated grading of non-multiple choice tests was often not feasible at South African universities because many students did not have English as a first language.	

5.4.2 Conclusions on responses to Research Question Four

The four most important benefits to adopting supplementary digital textbook content as perceived by faculty members interviewed in the research study correlate with those identified as important from studies in the literature review.



Figure 18. Benefits from the adoption of supplementary digital textbook content as identified by faculty members in the research study

5.5 Responses to Research Question Five

What are the barriers to adopting supplementary digital textbook content as perceived by faculty members making textbook adoption decisions at public universities in South Africa?

5.5.1 Summary of research findings and supporting literature in response to Research Question Five

BARRIERS TO THE ADOPTION OF SUPPLEMENTARY DIGITAL TEXTBOOK CONTENT AS PERCEIVED BY FACULTY MEMBERS	
1. The study found that lack of classroom audio-visual facilities was not a general constraint in the use of supplementary digital textbook content by faculty. 2. None of the respondents considered lack of institutional technical support a barrier to the adoption of digital content in the classroom. Both institutions in the study have technical support departments and actively encourage faculty to make use of course management systems employed by the university. 3. While studies in the literature indicate training of faculty on the use of supplementary digital textbook content is essential to its adoption, only 54% of faculty interviewed in the study believed that there was a need for education and training of faculty members on the benefits and use of supplementary digital textbook content; 29% disagreed. 4. The key issue on whether there was a perceived need for training of faculty on the benefits and use of supplementary digital textbook content appeared to be whether or not faculty members considered the supplementary content to be difficult to use. For those respondents that consider it difficult to use, training on its use was generally supported, subject to faculty member time constraints.	▪ Rogers 1976, 2003 ▪ Porter 1985 ▪ Boone and Kurtz 1989 ▪ Morris and Morris 1990 ▪ Adcock *et al* 1993 ▪ Cush and Buskist 1997 ▪ Marek *et al* 1999 ▪ Groves and Zemel 2000 ▪ Medlin 2001 ▪ Blackwell *et al* 2001 ▪ Foucault and Scheufele 2002 ▪ Hall and Elliot 2003 ▪ Nelson 2006 ▪ Rosenfeld 2006 ▪ Turner 2007 ▪ Clow *et al* 2007 ▪ Blythe 2008

5. The research data indicates a direct link between how effectively the value and benefits of supplementary digital textbook content are communicated to faculty members by publishers and the general extent to which supplementary digital textbook content has an influence on textbook adoption decisions. This is especially important for publishing companies because more than 80% of respondents indicated in the study that supplementary digital textbook content will become more important to their textbook adoption decisions in the future. The tendency by publisher representatives may be to only sell the benefits of supplementary digital textbook content to those faculty members that show an early interest in it and not to the majority of faculty for whom it will become increasingly important.
6. Respondents in the study supported the literature in identifying established teaching methods as a barrier to the adoption of supplementary digital textbook content.
7. Only 21% of respondents actively prescribed supplementary digital textbook content for students. In some of these cases this was only to a limited extent or only for more advanced students.
8. Studies in the literature indicate that students are unlikely to use supplementary digital textbook content unless it is prescribed by the course instructor. This implies that most students at the two institutions in the study are unlikely to be using the supplementary digital content currently supplied with their textbooks.
9. The primary reason given by faculty for not prescribing supplementary digital textbook content was unequal online access by students. Of those faculty that indicated they did not prescribe the supplementary material 63% cited unequal student access as an important reason for not doing so.

10. Faculty believed that students would use lack of internet access as a reason for not completing prescribed work with either on-campus or off-campus online access being considered insufficient for students. 11. Most respondents (84%) categorised faculty members making textbook adoption decisions in their schools or departments as either early or late majority adopters. The perception by faculty that the vast majority of their colleagues tended to be cautious and relatively slow adopters of new technologies indicates an underlying barrier to the adoption of supplementary digital textbook content by faculty members. Only 8% of faculty identified their schools or departments as falling into the innovator adoption category. The faculty of Science was self-identified as the most innovative faculty in adopting new and emerging technologies.	

5.5.2 Conclusions on responses to Research Question Five

The five most important barriers to adopting supplementary digital textbook content as perceived by faculty members interviewed in the research study corroborate those identified as important from studies in the literature review. The one exception to this was *lack of classroom facilities and institutional support* which as not found in the study to be a barrier to the adoption of supplementary digital content at the two institutions in the study.



Figure 19. Barriers to the adoption of supplementary digital textbook content as identified by faculty members in the research study

5.6 Recommendations to organisations

1. PUBLISHERS SHOULD FOCUS THEIR SALES AND PROMOTIONAL STRATEGY ON THE QUALITY OF TEXTBOOK CONTENT IN COMPETING FOR TEXTBOOK ADOPTIONS

With 91% of faculty in the study indicating that the quality of textbook content was important in textbook adoptions and a full half of respondents indicating that it was their single most important textbook adoption criterion, publishers would do well to focus on how the quality of content of textbooks submitted for adoption supports (1) course scope (2) course objectives (3) course curriculum (4) course academic rigour and (5) the teaching approach of the instructor.

2. PUBLISHERS HAVE AN OPPORTUNITY TO DEVELOP QUALITY CONTENT LOCAL PUBLICATIONS IN COMPETING FOR TEXTBOOK ADOPTIONS

Although opinions by faculty varied on the importance of local content in textbook adoptions, respondents indicated that the changing student demography at South African universities was creating an opportunity for local textbooks that offered local content and examples. However, faculty interviewed were adamant that the quality of content of local publications needed to at least equal the quality of content of imported textbooks while the expectation was that local textbooks would be priced more competitively than overseas editions are.

3. PUBLISHERS NEED TO ALLOW FOR THE COST OF TEXTBOOKS TO STUDENTS BECOMING AN INCREASINGLY IMPORTANT TEXTBOOK ADOPTION CRITERION IN TEXTBOOK ADOPTION DECISIONS

The study found that the cost of textbooks to students was important to all faculty members in making textbook adoption decisions. Cost of textbooks to students was identified as the third most important textbook adoption criterion at the two public universities in the study. If trends in the United States are to be followed in South Africa cost of textbooks to students will become increasingly important in textbook adoption decisions. A number of faculty indicated that they already use various methods to try to keep the cost of textbooks down for local students. Publishers will need to develop textbook offerings and promotional strategies that take the cost of textbooks strongly into account in their bid to win local textbook adoptions.

4. PUBLISHERS SHOULD EMPHASISE THE READABILITY AND COMPREHENSIBILITY OF THEIR TEXTBOOKS IN COMPETING FOR TEXTBOOK ADOPTIONS

Readability was the third most important textbook adoption criterion identified for faculty in the study. Publishers should emphasise the readability and comprehensibility of their textbooks in competing for textbook adoptions at public universities in South Africa, especially for introductory courses and for courses with a high number of students enrolled who do not have English as a first language. Readability of textbooks was, however, found to be less important for teaching courses with predominantly quantitative content.

5. PUBLISHERS SHOULD ALLOW FOR THE GROWING IMPORTANCE OF SUPPLEMENTARY DIGITAL TEXTBOOK CONTENT IN TEXTBOOK ADOPTION DECISIONS

The study found that supplementary digital textbook content only influenced textbook adoption decisions for 42% of faculty and that, for most of these respondents, it was not an important influence on their textbook adoption decisions. However, more than 80% of faculty interviewed indicated that they expect supplementary digital textbook content to become more important to their textbook adoption decisions in the future, a position supported in the literature. Publishers should ensure that their sales and marketing communications reflect the growing importance of supplementary digital textbook content. Publishers could test new promotional ideas developed around supplementary digital textbook content in competing for adoptions in faculties where supplementary digital textbook content is identified as already more important, such as in the Faculty of Science.

6. PUBLISHERS NEED TO BETTER SIGNAL THE BENEFITS OF ADOPTING SUPPLEMENTARY DIGITAL TEXTBOOK CONTENT TO FACULTY MAKING TEXTBOOK ADOPTION DECISIONS

Groves and Zemel (2000) found that 92% of faculty members interviewed believed that knowing the benefits of using a new method over traditional methods of teaching was important to whether or not they adopted a new pedagogic technology. This research study indicated a direct link between how effectively the value and benefits of supplementary digital textbook content are communicated to faculty members by publishers and the general extent to which the supplementary digital textbook content has an influence on textbook adoption decisions. There may be a need for better signalling by publishers of the benefits to faculty in adopting supplementary digital textbook content in publisher sales presentations, advertising, promotions and public relations.

7. PUBLISHERS NEED TO PROMOTE AND POSITION SUPPLEMENTARY DIGITAL TEXTBOOK CONTENT AS CORE TO THE OVERALL TEXTBOOK OFFERING

The study found that one of the reasons that supplementary digital textbook content was not an important influence on textbook adoption decisions was that many faculty members did not consider it core or essential to the overall textbook offering. If publishers wish to leverage the benefits of supplementary digital content included with their textbooks in competing for adoptions, they need to position supplementary digital textbook content as core to the bundled textbook offering in the minds of potential adopters. Some textbook adopters in the study indicated that they will not consider textbooks that do not include supplementary digital content such as electronic test banks. Publishers need to develop this type of essential positioning for the supplementary digital content included in all bundled textbook offerings.

8. PUBLISHERS SHOULD CAPITALISE ON THE PERCEPTION BY FACULTY THAT USING SUPPLEMENTARY DIGITAL TEXTBOOK CONTENT IN THE CLASSROOM CAN IMPROVE TEACHING EFFECTIVENESS

Many faculty interviewed believed that the use of supplementary digital textbook content in the classroom should improve faculty teaching effectiveness. This was considered to be especially the case using video content which allowed faculty to demonstrate course content in relation to practice in the field. Faculty also indicated that students increasingly expect the use of audio-visual content in classroom instruction. Publishers should capitalise on these perceptions by faculty in their competition for textbook adoptions.

9. PUBLISHERS NEED TO KNOW WHICH CATEGORIES OF SUPPLEMENTARY DIGITAL TEXTBOOK CONTENT ARE MOST VALUED BY FACULTY

The research found that, rather than adopting a publishing strategy of increasing the full range of supplementary digital materials offered, publishers should gain more adoptions by enhancing existing supplementary digital content in the areas most valued by faculty. The five categories of supplementary digital textbook content identified as most valuable to faculty in the research study were

1. Publisher presentation slides
2. Video clips, demonstrations and case studies
3. Digital instructor manuals
3. Practice exercises for students
5. Electronic test banks

Publishers should consider focusing their promotion of the supplementary digital content supplied with textbooks in these five key areas and possibly develop local supplementary digital content in one or more of these areas.

10. PUBLISHERS SHOULD CAPITALISE ON THE TIME-SAVING BENEFITS OF ELECTRONIC TEST BANKS THAT ARE INCLUDED WITH TEXTBOOKS SUBMITTED FOR ADOPTION

Some faculty interviewed considered electronic test banks their single most valued category of supplementary digital content and indicated that they would not consider adopting a textbook that did not include this category of supplementary content. It was also found that electronic test banks did not need to be online, interactive or offer automated grading to be valued by faculty members. The benefit most valued here was the time saved in preparing multiple choice tests for students. Publishers should consider capitalising more on the benefits offered by electronic test banks included with textbooks submitted for adoption. This could be done by specifically promoting the time-saving benefits of electronic test banks for faculties making use of multiple-choice questions for large introductory classes.

11. PUBLISHERS NEED TO SUPPORT THE GENERAL PRESCRIPTION OF SUPPLEMENTARY DIGITAL TEXTBOOK CONTENT BY FACULTY

The study showed that only 21% of faculty actively prescribed supplementary digital textbook content for students. This was despite the fact that 84% of faculty believed that supplementary digital textbook content had the potential to enhance student learning. Both the literature and the research data show that unless supplementary digital textbook content is prescribed for students they are unlikely to utilise it. Publishers should consider promoting the prescription of supplementary digital textbook content by faculty members. This could be done, for example, through sponsoring on-campus computer facilities for students as the biggest barrier to the prescription of the supplementary digital textbook content identified in the study was unequal online access for students.

12. PUBLISHERS SHOULD CONSIDER LOBBYING UNIVERSITIES TO MAKE THE ADOPTION BY FACULTY OF DIGITAL CONTENT AN INSTITUTIONAL REQUIREMENT
Given that most respondents (84%) categorised faculty members making textbook adoption decisions as early majority or late majority adopters, there may be a need by publishers to lobby public universities to make the adoption of digital content by faculty an institutional requirement. The literature identifies late majority adopters of new technologies as often needing to be coerced into using new technologies in the classroom (Hall and Elliot 2003). Public universities in South Africa are already moving to the implementation of course management systems that support digital content and should be responsive to the need to require faculty to adopt digital content. However, since the study also showed that most textbook adoption decisions at the two public universities in the study were made by the individual faculty members responsible for teaching the course, publishers would need to be careful not to alienate textbook adopting faculty in efforts to achieve digital content adoption at an institutional level.
13. PUBLISHERS SHOULD PLAY AN ONGOING SUPPORTING ROLE FOR FACULTY IN THEIR ADOPTION OF SUPPLEMENTARY DIGITAL TEXTBOOK CONTENT
The study found that ongoing support from publisher representatives was an important criterion in textbook adoption decisions for 13% of respondents. Publishers should structure their organisations to play an ongoing role in support of institutions and faculty adopting supplementary digital textbook content. Such ongoing support could take the form of local call centre facilities and regular demonstrations on the use and benefits of supplementary digital textbook content for both faculty and students. This ongoing support should give faculty more confidence in adopting supplementary digital textbook content and also give the publisher a distinct competitive advantage in the competition for textbook adoptions. This is because the research shows that supplementary digital textbook content is expected by faculty to play an increasingly important role in textbook adoption decisions in the future.

5.7 Recommendations for further research

5.7.1 This study focused on the adoption decisions of textbooks with supplementary digital content made at public universities in South Africa. It would be valuable to extend the study to private higher education institutions in South Africa and to compare textbook adoption decisions made at public and private higher education institutions.

5.7.2 It would be useful to extend the questions raised in this research study to textbook adoption decisions made in high schools in South Africa. While the barriers to the adoption of supplementary digital content may be

higher and available resources lower for public high schools in South Africa, private educational institutions such as the Crawford College group of schools would be expected to already be considering the benefits of adopting digital content in high school education.

5.7.3 This study focused of the adoption of supplementary digital textbook content at two public universities located in Johannesburg, Gauteng. Future studies may expand this research to a larger sample where the role of supplementary digital textbook content in textbook adoptions could be compared between provinces.

5.7.4 This study adopted a qualitative research methodology. It would be useful to compare the responses to the research questions attained from this study with results achieved from a quantitative study across a wider sample of faculty members making textbook adoption decisions.

5.7.5 This study focused on the attitudes to the adoption of supplementary digital content at public universities in South Africa from the viewpoint of faculty members that make textbook adoption decisions. It would be interesting to consider the adoption of textbooks with supplementary digital textbook from the viewpoint of the students at public universities in South Africa. The research could consider the textbook adoption criteria most valued by students; whether students prefer textbooks adopted that include supplementary digital content; whether they use the supplementary digital supplied with textbooks and whether they believe this supplementary content is effective in supporting learning.

5.7.6 Future studies could consider whether supplementary digital textbook content plays a role in textbook adoption decisions made for courses specifically designed for distance education. Textbook adoption decisions made at the University of South Africa (UNISA), for example, were not included in this research study and this public university may

well consider digital content a valuable pedagogic component in supporting distance learners.

5.7.7 A potential area for further research related to this study is the influence that the growing adoption of course management systems by public universities in South Africa may be having on textbook adoption decisions made by faculty members within their institutions. Course management systems such as *WebCT* or *Moodle* rely on the supply of pedagogic content in digital form. Textbooks submitted with supplementary digital content that is designed to integrate easily into established course management systems may increasingly have a better likelihood of adoption at public universities in South Africa.

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APPENDIX A: Textbook sample with supplementary digital content

Title: *Harrison's Principles of Internal Medicine, 17th Edition*

Publisher: McGraw-Hill

ISBN: 978-0-07-146633-2

APPENDIX B: Pearson Education Publishers' supplementary online textbook content

Pearson (Prentice Hall, Longman, Allyn & Bacon, Benjamin Cummings, Addison Wesley) is the largest international higher education publisher and offers multiple online textbook support websites.

APPENDIX C: Categories of supplementary digital textbook content specified for purposes of the research study

SUPPLEMENTARY DIGITAL TEXTBOOK CONTENT FOR FACULTY
1.1 Digital instructor manual & teaching notes
1.2 Publisher presentation slides
1.3 Video clips, video demonstrations and video case studies
1.4 Supplementary audio files, such as interviews with experts in the field of study
SUPPLEMENTARY DIGITAL TEXTBOOK CONTENT FOR STUDENTS
2.1 Practice exercises for students
2.2 Student study plans
2.3 Self-assessment tools for students
2.4 Personal development plans for students
SUPPLEMENTARY DIGITAL TEXTBOOK CONTENT FOR FACULTY AND STUDENTS
3.1 Chapter summaries
3.2 Electronic test banks
3.3 Electronic versions of the textbook
3.4 Audio files, such as MP3 revision notes and chapter summaries

APPENDIX D: Interview discussion guide

The questions used in the discussion guide were drawn directly from the research questions using an open-ended structure to allow for flexibility in the answers provided by respondents.

DISCUSSION GUIDE

1. **Do you prescribe a textbook for the courses that you teach? What are your reasons for doing this?**

2. **Do you believe that the choice of textbook makes a difference to student learning?**

3. **How frequently do you change textbooks once adopted? What are some of your reasons for changing an adopted textbook?**

4. **How are textbook adoption decisions currently made within your faculty?**

5. **What are the adoption criteria considered most important in making textbook adoption decisions within your faculty?**

6. **Do you believe that supplementary digital textbook content generally influences textbook adoption decisions made within your faculty?**

7. **What are the categories of supplementary digital textbook content most valued by faculty members making textbook adoptions decisions within your faculty?**

   [Respondents shown list of 12 categories of supplementary digital textbook content: Appendix A]

8. **In your view, what are some of the benefits to faculty and students in using supplementary digital textbook content supplied by publishers?**

9. **In your view, what are some of the barriers to using the supplementary digital textbook content supplied by publishers?**

10. **In which of the following five new technology adoption categories would you place faculty members making textbook adoption decisions in your school or department?**

    [Respondents shown diagram of *Rogers' Adoption Curve for Innovations and Adopter Categories:* Figure 1]

11. **Do you believe that supplementary digital textbook content will become more or less important to textbook adoption decisions made within your faculty in the future? What are your reasons for this view?**

APPENDIX E: Respondents interviewed in research study

	RESPONDENT	DATE OF INTERVIEW
1	Professor G. Van Zyl, Head of Department of Economics, Faculty of Economic and Management Sciences, University of Johannesburg	25 July 2008
2	Professor T. De Wet, Head of Department of Anthropology and Development Studies, Faculty of Humanities, University of Johannesburg	31 July 2008
3	Professor G. Els, Head of Department of Finance and Investment, Faculty of Economic and Management Sciences, University of Johannesburg	31 July 2008
4	Professor M. Gohnert, Head of School of Civil and Environmental Engineering, Faculty of Engineering, University of the Witwatersrand	18 August 2008
5	Mr. P. J. Knottenbelt, Department of Mining Engineering, Faculty of Engineering, University of Johannesburg	18 August 2008
6	Dr. G. Fanourakis, Department of Civil Engineering, Faculty of Engineering, University of Johannesburg	18 August 2008
7	Professor H. D. Chandler, School of Mechanical Engineering, Faculty of Engineering, University of the Witwatersrand	19 August 2008
8	Ms. C. Taylor, School of Anthropology, Faculty of Humanities, University of the Witwatersrand	20 August 2008
9	Dr. M. Dos Santos, Department of Marketing, Faculty of Economic and Management Sciences, University of Johannesburg	21 August 2008

10	Professor R. F. Laubscher, Department of Mechanical Engineering Science, Faculty of Engineering, University of Johannesburg	26 August 2008
11	Dr. G. H. Kruger, Department of Psychology, Faculty of Humanities, University of Johannesburg	26 August 2008
12	Professor G. J. Kruger, Department of Chemistry, Faculty of Science, University of Johannesburg	26 August 2008
13	Mr. C. R. Beaumont, School of Mining Engineering, Faculty of Engineering, University of the Witwatersrand	27 August 2008
14	Professor J. Carter, School of Physics, Faculty of Science, University of the Witwatersrand	27 August 2008
15	Ms. L. Groenewald, Department of Sociology, Faculty of Humanities, University of Johannesburg	1 September 2008
16	Dr Y. Broome, Senior Lecturer, School of Psychology, Faculty of Humanities, University of the Witwatersrand	9 September 2008
17	Ms. L. Hagemeier, Department of Sociology, Faculty of Humanities, University of the Witwatersrand	10 September 2008
18	Professor Scholes, School of Animal, Plant and Environmental Sciences, Assistant Dean Faculty of Science, University of the Witwatersrand	10 September 2008
19	Professor H. Zarenda, School of Economics, Faculty of Economic and Management Sciences, University of the Witwatersrand	15 September 2008
20	Professor C. Auret, School of Finance and Investment, Faculty of Economic and Management Sciences, University of the Witwatersrand	15 September 2008

21	Mr. S. R. Habtay, School of Marketing, Faculty of Economic and Management Sciences, University of the Witwatersrand	15 September 2008
22	Professor H. Winkler, Department of Physics, Faculty of Science, University of Johannesburg	17 September 2008
23	Dr. N. A. Moteetee, Department of Botany and Plant Biotechnology, Faculty of Science, University of Johannesburg	19 September 2008
24	Professor J. P. Michael, Head of School of Chemistry, Faculty of Science, University of the Witwatersrand	26 September 2008