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IMPACT OF AN UNLIMITED E-BOOK SUBSCRIPTION SERVICE AND DIGITAL LEARNING SOLUTION IN MANAGEMENT EDUCATION AT A MINORITY SERVING UNIVERSITY

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ABSTRACT

Aim/Purpose	The exorbitant cost of traditional textbooks, which particularly impact low-income, underrepresented minority groups, can be a barrier to student success in higher education that contributes to educational inequities. The aim of this multi-methodology study, conducted at a mid-Atlantic minority-serving institution that serves primarily first-generation and lower-income learners, is to explore the impact of, and student satisfaction with, a one-price per semester unlimited e-book subscription service and digital learning solution that includes a number of embedded interactive features, adaptive student learning activities, and learning outcome assessments. In addition, the paper is purposed to inform individuals in higher education so that they can make knowledgeable decisions when considering various book acquisition options.
Background	A mid-Atlantic minority-serving institution becomes an early adopter of a one-price per semester unlimited e-book and interactive digital learning subscription service. Following adoption, a quantitative assessment regime was conducted to inform the institution.
Methodology	Pass-fail rates for selected courses were compared before and following implementation and cost savings estimates in U.S. dollars were generated in collaboration with the bookstore and publisher. Additionally, student satisfaction and perceived learning efficacy survey were created and distributed.

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Contribution	This paper contributes significantly to the literature as it includes a population that is frequently neglected in studies that primarily are concentrated at traditionally white institutions (TWIs) with very low enrollments of Black students.
Findings	A positive increase in course pass rates was found. Most students expressed having been concerned about paying for books in prior semesters, that college textbooks cost too much, have struggled to purchase textbooks in the past, believe that the subscription plan helps students save money, and would like to see widespread adoption. With respect to the digital learning solution, the students found it easy to use, appreciated the integrated interactive features, believed the system helped them to learn more and stay on schedule, and were largely in agreement that they would like it adopted in more of their classes. When correlations, crosstabulations, and Chi-Square tests were conducted, students who indicated having the greatest financial concerns were stronger in their satisfaction with the unlimited e-book subscription plan and most likely to want to see a similar plan adopted in all of their courses.
Recommendations for Practitioners	To better meet the needs of students, remove barriers to student success, and improve student learning outcomes, universities must play a role in delivering affordable student-centered course content.
Recommendations for Researchers	E-book subscription services are a relatively new model and one that requires extensive exploration in order to examine the impact on student learning outcomes as well as perceived learner satisfaction.
Impact on Society	The implications of this study are that the adoption of an unlimited e-book subscription that includes access to high-quality digital learning resources positions institutions of higher education well in the instance of a global pandemic or other catastrophic events that causes the sudden pivot to remote instruction. Additionally, such a system has both a positive impact on student achievement as well as perceived favorably by students. Further, the adoption of a low-cost subscription option is particularly beneficial to students who struggle financially.
Future Research	It is the goal of the authors to partner with scholars at a broad range of institutions to further extend this line of inquiry.
Keywords	e-book, e-book subscription, HBCU, minority education, first-generation learners, Cengage Unlimited, MindTap, student learning success, e-learning, affordable course content, learning materials

INTRODUCTION

It is often said that without education there can be no social change and books in various forms are the carriers of knowledge and vehicles for enlightenment. While it is known that books facilitate learning, in American higher education, the high cost of textbooks has long since been burdensome and often prohibitive to many students coming from disadvantaged socio-economic backgrounds. The exorbitantly high cost of textbooks in higher education, which particularly impacts low-income and underrepresented minority groups, not only adds to the financial obligations of attending college but serves as a barrier raising serious issues of equity and accessibility (Curry, 2021). Accordingly, the adoption of low-cost, highly portable e-books with learner-centered features has been heralded as a solution to many of the issues in textbook access and educational equity (Almekhlafi, 2020). More specifically, the introduction of unlimited digital textbook subscription services, which have emerged in recent years, is being touted as the ultimate panacea for making learning materials more accessible.

The adoption and usage of e-textbooks have increased significantly in recent years (DeNoyelles & Raible, 2017), with students appreciating their low cost (Baron et al., 2017). While some studies have shown them equally as effective as printed books at promoting student learning and achievement (Daniel & Woody, 2013), others have found higher levels of student motivation and perceived learning as well as more effective psychomotor learning – learning that involves coordinated movement (Rockinson-Szapkiw et al., 2013). However, not all e-books are the same in terms of effectiveness with learners, and the preponderance of instructional technologists researching the topic agree that for e-books in higher education to live up to their promise of enhancing student learning, they need to include embedded interactive features, multimedia, and enhanced learning tools (Buzzetto-More et al., 2007; DeNoyelles & Raible, 2017; Gueudet et al., 2016; K. Huang et al., 2014).

Recently, with Covid-19, higher education found itself pivoting as a global pandemic forced the sudden shift to remote learning. An unprecedented increase in the adoption of e-learning resources ensued, and a dramatic uptick in e-book usage as schools struggled to pivot to online remote instruction while ensuring students' access to high-quality immersive educational resources (Dignan, 2020; Govindarajan & Srivastava, 2020; Lederman, 2020). This phenomenon has shed a spotlight on the need to understand better the implications and options available in the book and e-book market.

This paper contributes significantly to the literature as it includes a population that is frequently neglected in studies that primarily are concentrated at traditionally white institutions (TWIs) with very low enrollments of Black students. While Historically Black Colleges and Universities (HBCUs) make up just 3% of America's colleges and universities, they produce almost 20% of all African American graduates and 25% of African American graduates in the fields of science, technology, engineering, and mathematics. Further, 50% of public-school teachers of African-American descent and 70% of Black doctors and dentists attended Historically Black Colleges of Universities, otherwise known as HBCUs (United Negro College Fund [UNCF], 2015).

Established in 1886, the University of Maryland Eastern Shore (UMES) is a Historically Black, 1890 land grant institution. It is a member of the University System of the State of Maryland and primarily serves first-generation, low-income, and minority learners. The student population is approximately 2,600, as of the fall of 2020, with a student body that is 71.1% African American, 14.9% white, 5% Hispanic, 3.6% multi-ethnic, and 3% international. UMES was ranked in the top 20 among Historically Black Colleges and Universities (HBCU) in 2020, and the acceptance rate for applying students was 61%, with the majority of students coming from the mid-Atlantic region, more specifically the Baltimore and Washington D.C. urban centers. UMES has a long history of providing academic programs and services for ethnically and culturally diverse students and, toward that end, offers programs and assistance that attract, serve, retain, and graduate many first-generation college students (Buzzetto-Hollywood & Mitchell, 2019; Buzzetto-Hollywood, Mitchell, & Hill, 2019; Buzzetto-Hollywood, Quinn, Wan & Hill, 2019).

To better meet the needs of students, remove barriers to student success, and improve student learning outcomes, in the Fall of 2018, the Department of Business, Management, and Accounting at UMES became an early adopter of a one-price per semester unlimited e-book and computer adaptive digital learning solution subscription service. In order to evaluate the efficacy of the adoption, pass-fail rates were collected and compared, cost savings estimates were calculated, and student satisfaction and perceived learning efficacy surveys were created and distributed to students in selected courses.

The Cengage Unlimited product was introduced to the public in the Fall of 2018 and is a subscription service that allows students to pay a single price (\$119 per semester, \$179 per year, or \$239 for two years as of Fall 2020) for access to all of their Cengage e-textbooks as well as for use of the digital learning platforms such as MindTap and WebAssign. Additionally, students have the option of print rentals at \$7.99 per book with free shipping.

Cengage MindTap is a digital learning solution produced by Cengage that includes a fully interactive e-book with embedded study tools, adaptive quizzes that respond to student performance and allow multiple attempts, highlighting and notetaking capabilities, a Readspeak feature that reads text aloud to students, a centralized dashboard designed to keep students organized and on track, an e-portfolio app, 12 different metrics to provide actionable insight on student engagement, and a mobile app so that course learning is available across devices. To distinguish the difference between Cengage Unlimited and MindTap for this study, Cengage Unlimited is the one-price-per-semester subscription service, whereas MindTap is the digital learning solution where instructors customize courses built around a multimedia-infused e-book with enhanced features and adaptive assessments.

The interactive elements of Cengage MindTap include personalized adaptive study plans that help students review and understand the concepts and skills in their courses. Adaptive elements start with quiz-based assessments and generate a customized set of study materials based on results. The study materials are built around specific concepts from the assessment that the student did not understand and include target readings and a range of additional exercises. After working through their adaptive study plan, students can retake assessments with new questions focused on only the content they could not answer the first time correctly. The instructor can set the number of attempts up to unlimited, and scores can only improve. Finally, a student can view a line graph checking their progress through their plan at any time. Cengage Unlimited/MindTap can be integrated with most learning management systems (LMS), including Canvas, Blackboard, Moodle, and Brightspace. The LMS integration allows students to access the digital learning enhanced e-book content directly from a campus LMS making the transition from the LMS components of the course to the MindTap portions seamless. For this study, the institution used Blackboard, and full integration with the LMS was achieved. This integration allowed students to move between the systems with ease and linked the grade books so that the scores earned in MindTap transferred into the grade book in Blackboard.

In order to measure the efficacy of program adoption, a survey was initiated and the data collected during this study were used to test the following research questions:

Research Question 1: Students are satisfied with using a digital learning platform in core management education courses.

Research Question 2: Management students attending a mid-Atlantic HBCU often struggle with the cost of textbooks.

Research Question 3: Unlimited e-book subscription services are beneficial to students with financial concerns.

The remainder of the paper is organized as follows: literature review, methodology, findings, discussion, limitations, conclusion, references, and author biographies.

LITERATURE REVIEW

While compiling this literature review, the authors sought to present a thoughtful exploration of the e-book literature that would support and illustrate critical topics being explored in this paper. Accordingly, the literature review is organized as follows: e-book definitions, the efficacy of e-books, e-book features and the Cognitive Theory of Multimedia, student perceptions and intent, concerns about e-books, cost as a motivating factor for adoption, Covid-19 and e-books, and summary thoughts.

E-BOOK DEFINITION

There are many definitions of e-books. According to the Merriam-Webster Dictionary (2022), an e-book is “a book composed in, or converted to, a digital format for display on a computer screen or handheld device.” Mattison (2002) defined an e-book as a monograph akin to a printed book made

available in a digital format to be read online or downloaded to a handheld device. According to Weber and Cavanaugh (2006), an e-book is a digital publication that includes multimedia features, including pictures, animation, sound, music, video, and hyperlinks, which can be viewed on desktop computers, laptop computers, and portable devices.

Abbott and Kelly (2004) explained that while an e-book can be as simple as a scanned version of a printed publication, inherent is the ability to make available a number of features to the reader, which include multimedia, hyperlinks, and other interactive components, searchability, and customizability to change text size or convert text to audio so as to meet the needs of readers who require accommodations. As a result, they explained that print-on-demand books should not be considered e-books, as once printed, many of the qualities inherent in the electronic format cease to be available.

EFFICACY OF E-BOOKS

What about efficacy? Multiple studies have shown that interactive e-book technologies can reinforce student learning, assist with assignments, help students develop confidence about the subject matter, and provide students with immediate, formative feedback (Y. Huang et al., 2012; Schwan & Riempp, 2004; Tung & Deng, 2006).

Buzzetto-More and Ukoha (2009), who explored an interactive online e-book and adaptive digital learning system in remedial mathematics instruction, found students perceived the system easy to use, a valuable learning tool, successful at helping them learn course concepts, and an aide that helped them perform better on their course assessments. Further, an analysis of longitudinal student performance data compared to a control group found a significant decrease in withdrawal rates and a measured increase in students' pass rates in sections that had adopted the digital learning solution versus students exposed to only printed course content.

Edgcomb et al. (2015) reported that students using interactive textbooks in introductory STEM (Science, Technology, Engineering, Math) courses found grades improved by 0.28 points on a 0-4 point scale or 1/4 letter grade. Hwang and Lai (2017) found similar results with students in a flipped math class using an interactive e-book. They reported significant benefits in student learning achievement and self-efficacy. The study also found that students with lower self-efficacy benefited more than those with higher self-efficacy, and these students also spent more time reading the e-books before and after class.

Rockinson-Szapkiw et al. (2013) conducted a study with 538 students that explored the relationship between textbook format and student grades and perception of learning. The results found no difference in either cognitive learning or grades between e-book users and printed-text users. However, when effective and psychomotor learning was considered, the authors found that students who selected e-books reported higher perceived effective learning and psychomotor learning than peers who had selected printed texts.

Asrowi et al. (2019) explored the impact of using interactive e-books on students' learning outcomes in junior high school social science courses. Using a control and an experimental group and employing a comparative test of the knowledge, the authors found significant differences in the scores between the control group and the experimental group, with the experimental group outperforming the control group by a sizeable margin. Accordingly, they concluded that students using interactive e-books had higher learning outcomes on social issues than those using printed course books.

Scheiter and Gerjets (2007) examined the effectiveness of self-controlled learning with hypermedia included in many e-books and found that digital reading meets the social and psychological needs of readers in a wider range and ensures the maintenance of attention. Further, Güneş (2010) concluded that reading an e-book from a screen activates various brain regions and improves skills, such as attention, decision-making, and controlling complex thoughts at the highest level. Finally, Karakoç

Öztürk (2021, p. 9) concluded that “the use of e-books in reading education may contribute to individual differences and needs of students, who learn in different ways and keep and maintain their attention in different forms, and to sensitive teaching.”

K. Huang et al. (2014) explored the impact of concept maps and videos integrated into multimedia-infused e-books on learners. According to their findings, the presence of concept maps in e-books reduces learners’ cognitive load and enhances learning outcomes, and that embedded videos are superior to text in terms of learning efficacy. They concluded that as a result of the benefits in terms of reducing cognitive load and learning efficacy, it is likely that e-books will eventually become the norm in higher education moving forward; however, they added that knowledge about effective instructional design centered around e-book adoption and digital learning strategies is paramount to success.

E-BOOK FEATURES AND THE COGNITIVE THEORY OF MULTIMEDIA

According to Karakoç Öztürk (2021), e-books have unique features that make them easily distinguishable from printed books, primarily concentrated around interactivity and integration with assessments and additional course materials. In addition, Abbott and Kelly (2004) explained that inherent in e-books is the ability to include dynamic features helpful to readers, including embedded multimedia, hyperlinks, and other interactive components, search features, and customizability to change text size or convert text to audio to meet the needs of readers who require accommodations.

The Cognitive Theory of Multimedia Learning was originally introduced under the name Multimedia Learning Theory (MMLT) by Richard Mayer in 1997, falling within the grand theory of Cognitivism. It posits that multimedia instructional content is designed with consideration to how the human mind processes information and therefore leads to meaningful learning than when static content is employed (Mayer, 2014). The Cognitive Theory of Multimedia Learning posits that the human mind is a dual-channel, limited-capacity, active-processing system, and educators/creators can construct engaging multimedia messages using text and graphics that stimulate and guide appropriate cognitive processing without overloading a learner’s cognitive system (Mayer, 2014).

How do e-books relate to the Cognitive Theory of Multimedia Learning? Several e-learning scholars have suggested that e-books with interactive and multimedia features support the theory (Bozkurt & Bozkaya, 2015; Buzzetto-More, 2015; Y. Huang et al., 2012; Karakoç Öztürk, 2021). Ravid et al. (2008) assert that e-book usage makes it possible for learners to perform actions, such as investigating the text, highlighting, and even interpreting, beyond simply reading and viewing. Buzzetto-More (2015) discussed the benefits of short embedded videos in course content, noting that videos as instructional aids are consistent with the Cognitive Theory of Multimedia Learning. Ciampa (2012) asserted that e-books are constructivist, supporting active learning by providing students with multimedia and multisensory opportunity to engage with content, and Castek et al. (2006) highlighted that interactive multimedia features support self-directed learning/learner control.

Scheiter and Gerjets (2007) postulated that learner control is one of the significant advantages of hypermedia learning. More specifically, they explain that learner control might increase students’ interest and motivation, facilitate adaptive instruction, or provide affordances for active and constructive information processing. Further, they assert that e-books are revolutionizing our definition of learning and making it a more creative and interactive endeavor.

Finally, Gueudet et al. (2016) documented a collaborative process of creating an e-book, explaining that it should be viewed as creating a toolkit. They elaborated that as a toolkit, an e-book should include a more nonlinear experience with multiple pathways to navigate through the topic areas, concept maps, videos, and other elements purposed to improve learning outcomes for readers.

STUDENT PERCEPTION AND INTENT

Qazi et al. (2018) conducted a study that explored students' intent toward e-book usage in Pakistan using a Likert-scaled survey methodology. According to the findings, compatibility, complexity, observability, ability to try a product prior to purchase, attitude, and awareness significantly impact behavioral intention.

Baron et al. (2017) surveyed 429 students across five countries and found that participating students overwhelmingly indicated a preference for reading printed books over e-books as long as the cost was the same. Cost and convenience were reported as the biggest drivers of e-book selection. The authors concluded that the features that would propel e-book adoption are increased portability and accessibility on mobile devices; low cost; searchability; customizability; incorporation of videos; screen readers, notes, and study guides; and other enhanced interactive features.

Buzzetto-More et al. (2007) conducted a study at the University of Maryland Eastern Shore and concluded that students at that time were receptive to the transition to e-books; however, more widespread adoption and acceptance would increase as e-book technology evolved to include more interactive, adaptive, and learning-centered features. The authors explained that learner-centric features would propel e-book adoption in the future more than would low cost and convenience.

Almekhlafi (2020) reported that preservice student teachers had a significantly more positive attitude towards interactive e-book usefulness for content learning and reported more advantages than non-interactive e-books. Almekhlafi (2020) also recommended that e-books be integrated into all curricula areas across the different academic departments in the United Arab Emirates university system. He further recommended that partnerships with well-known e-books and curriculum development companies be established.

CONCERNS ABOUT E-BOOKS

An article published in *Educause Review* (DeNoyelles & Raible, 2017) explained that not enough e-textbooks offer advantageous interactive features such as instructor annotations, adaptive quizzes, highlighting features, multimedia, and other embedded enhanced instructional activities. The authors concluded that these embedded features are necessary for e-books to live up to their promise.

Daniel and Woody (2013) examined student uses of print and electronic textbooks in-home and laboratory settings. They found that student quiz scores remained the same whether students had accessed print or electronic textbooks. They also discovered that reading times were higher for electronic textbooks. Finally, they found that when students read e-books outside of the laboratory setting at home, there were more extraordinary incidents of multi-tasking. As such, they concluded that students might often be distracted while interacting with e-texts.

Hobbs and Klare (2016) and Jeong (2012) explored challenges related to reading from a screen. In particular, the discomfort involved with reading from a screen, mainly when using a computer monitor, has been found to cause eye fatigue, thereby affecting concentration and comprehension (Jeong, 2012). Research has shown that reading from a screen is 20% to 30% slower than reading from paper (AlShaali & Varshney, 2005). As a result, AlShaali and Varshney (2005) concluded that text displayed on a computer screen should contain at least 25% less text than paper media. They further noted reasons for reducing the amount of text when reading from handheld devices, citing smaller screens resulting in greater effort to move from one screen to the next. Dyson and Haselgrove (2000) examined reading patterns and scrolling movements and found that the overall time spent pausing between movements was the best predictor of comprehension. As a result, De Salas and Ellis (2006) recommend that they be organized strategically into topically meaningful information 'chunks.'

COST AS A MOTIVATING FACTOR FOR E-BOOK ADOPTION

Dr. Keith Curry, President of Compton College, explains that education is a right and not a privilege in the U.S. with many students, particularly low-income and minority groups, underrepresented in higher education struggling to pay school fees, afford books, and handle basic living expenses. Accordingly, he explains that efforts to reduce textbook costs can support equity goals (Curry, 2021).

Research from *Achieving the Dream* (Griffiths et al., 2018) found that the cost of traditional textbooks can account for up to 80% of the cost of college attendance for Pell or other grant aid recipients and 53% of students reported either not purchasing or renting the required materials for a course on at least one occasion. Further, 17% of underrepresented minority students had dropped a course due to the high cost of textbooks. Similarly, a study conducted by Morning Consult (Cengage, 2018) that surveyed 1,651 current and former college students, found that the lack of affordability of course materials had a significant negative impact on learning and course performance. Eighty-five percent of participants cited purchasing textbooks as financially stressful, and nearly half of the participants (43%) said they had saved money by skipping meals to afford course materials. In addition, almost 70% of students reported getting a job to pay for textbooks, and 31% had taken fewer classes to save on textbook costs. Further, the study found that minority students were more significantly negatively impacted by the high cost of textbooks, with 35% of African American participants saying that they had to skip trips home to save money for books. Finally, 81% of respondents said that easily accessible digital course materials would have a positive impact on their grades, and 72% said that cost-effectiveness is very important when considering digital course materials.

Reduced course content costs appeal to many educators across disciplines, who have been using digital learning tools to engage and motivate students and improve the learning experience (Buzzetto-Hollywood, Mitchell, & Hill, 2019; Buzzetto-More, 2015; Quinn & Buzzetto-Hollywood, 2019). Accordingly, the book publishing industry is rapidly changing, focusing on lower-cost products, phasing out print textbooks, and investing in digital courseware and publishing (McKenzie, 2019). Further, the internet is impacting the way academic publishing has been evolving. The top academic publishers are now competing with Massive Open Online Courses (MOOC) and OERs which are providing quality course content at no charge. In an effort to protect revenues, the subscription rental model, where students pay for the content for a specific time period, is gaining prominence.

Open educational resources are often presented as the solution to the high price of college textbooks. They are defined by the University of Maryland Global Campus (UMGC, 2022) as “free digitized materials offered to educators, students, and self-learners under a Creative Commons (or other “open”) license that allows users to copy, use, adapt, and redistribute for educational and research purposes.” The benefits of OERs include that they are available at little or no cost and that they are scalable. While they have been with us for over 20 years, with the term OER having been coined by UNESCO in 2002, they have not become pervasively used, and their future remains uncertain (Berger, 2018). The drawbacks of OERs include quality and accuracy issues, language barriers, static formats, the extra effort required for adoption, a lack of technological support, intellectual property concerns, unsure sustainability, and possible ADA compliance issues (UMGC, 2022). Further, not all specialized program accrediting bodies endorse the use of OERs in accredited degree programs. Nevertheless, OER adoption has been found to result in direct cost savings for students (Griffiths et al., 2018). According to Griffiths et al. (2018), to sustain the use of OERs, institutions will need to develop a plan to cover financial costs, make updates and improvements, support faculty, and develop an OER culture among faculty and administrators.

A paucity of research exists on the topic of e-book subscriptions, and most of what little can be found comes from examinations of college library subscriptions. A study by LaMagna et al. (2020), conducted at a large urban community college, found that a large-scale subscription model has the lowest cost-per-use and serves the largest portion of students. Hollywood et al. (2020) explained that e-book subscription plans help students save money, with students with financial concerns seeing the

most considerable benefits. Finally, in an article in *Education and Career News* (Gawlak, 2019), Jenny Billings, the chair of the curriculum and developmental English and study skills at Rowan-Cabarrus Community College, explained that subscription models help to “meet students where they live.”

COVID-19 AND E-BOOKS

In 2020, Covid-19 forced educational institutions to rapidly pivot to remote learning and a dramatic uptick in e-books usage and e-learning resources ensued (Lederman, 2020; Pressman, 2020) as individuals were pushed away from overpriced textbooks into digitized content (Dignan, 2020) and immersive augmented learning software (Govindarajan & Srivastava, 2020). An article in *Harvard Business Review* (Govindarajan & Srivastava, 2020) explains that the forced experiment in online instruction has significantly lowered the psychological barriers to change among parents, students, faculty, and university leaders. Further, Lambert (2020) explains that integrated digital learning solutions are now seen as more valuable than traditional textbooks selling for much less with greater profit margins and with greater acceptability by today’s learners, who see them as a better return on investment. Several studies found that electronic textbooks adopted following a pivot to remote instruction that included interactive features designed to engage and motivate students with immediate feedback and real-time responses enhanced the teaching and learning process (George, 2020; R. H. Huang et al., 2020). At the same time studies such as one released by Chabbott and Sinclair (2020) noted that the move to online learning placed many under-resourced and at-risk students in a position to struggle as they dealt with limited or no access to the technologies and resources necessary to be successful.

CONCLUDING THOUGHTS

While several definitions of e-books exist, for the purpose of this paper, the authors wanted a straightforward definition from which to operate. As such, they decided to define an e-book as a digital collection of text and narrative content available across multiple platforms and devices that incorporates embedded interactive multimedia features and that allow the user to customize and control the experience. Further, when applied to the teaching and learning environment, effective e-books must include assessments and other adaptive content designed to support active learning. Studies included in this literature review have shown that interactive e-books can enhance student learning, encourage multisensory engagement, and provide students with immediate, formative feedback. Further, students consistently report cost savings as an influencing factor for moving to e-books, which is encouraging institutions to consider open educational resources, e-book adoption, book rental programs, and even unlimited e-book subscription models. At the same time, concerns still exist that not all e-books include adequate interactive multimedia components and several studies included in this paper have explored challenges related to reading from a screen and issues with students’ attention spans and tendency to multi-task.

This paper asserts that there is a dearth of research studies that examine the impact of unlimited e-book subscriptions on students especially as it concerns first-generation, primarily low-income students attending a minority-serving institution. Accordingly, the authors believe that this paper will fill a significant gap that currently exists by considering HBCU students’ perception of and satisfaction with the perceived efficacy of a digital learning e-book platform, how students enrolled at a minority-serving institution view traditional textbook costs, and whether an unlimited e-book subscription service is beneficial to students with financial concerns.

The remainder of this paper will explore the results of a mid-Atlantic HBCUs decision to become an early adopter of an unlimited e-book subscription model. It is organized as follows: methodology, findings, discussion, limitations, conclusion, references, and authors’ bios.

METHODOLOGY

BACKGROUND

A business department at a mid-Atlantic minority-serving university had previously engaged in several rounds of inquiry in 2007, 2009, and 2017, via surveys and listening sessions, to determine student receptivity to e-books. During this inquiry, students consistently commented that book fees were often cost-prohibitive and posed an unreasonable financial burden. Additionally, a prior study found that students were overwhelmingly receptive to e-book adoption in their courses when the cost was considered (Buzzetto-More et al., 2007). Further, a study conducted by the lead author a decade earlier (Buzzetto-More & Ukoha, 2009) which explored the impact of an adaptive digital learning system in remedial mathematics instruction at the same institution, found positive outcomes in terms of learner satisfaction, withdrawal rates, and student performance.

In response to the information gained during the inquiries and a University System of Maryland initiative to lower textbook costs, the Assurance of Learning (AOL) Committee in the Department of Business, Management, and Accounting (DBMA) at the University of Maryland Eastern Shore (UMES) began exploring different textbook options. The faculty in the Department were consulted, and built-in assessments, screen reading and notetaking capabilities, translation options, and adaptive content were prioritized as desired features. While open educational resources were found to be the cheapest financial option, they were not found to contain the adaptive multimedia content identified as important by the faculty. Further, faculty teaching in the accounting discipline expressed a strong objection to the use of OERs, citing concerns with quality and accuracy, updates and timeliness of the content, sustainability, language barriers, and possible ADA compliance issues. As a result of the review, the AOL Committee decided that an unlimited e-book subscription was best to meet the needs of faculty and students, remove barriers to student success, and improve learning outcomes. This choice came at the same time that Cengage was launching the Cengage Unlimited program. Accordingly, in the Fall of 2018, the UMES DBMA became an early adopter of a newly launched one-price per semester unlimited e-book and computer adaptive digital learning solution subscription service.

EVALUATION

Assurance of learning is an ongoing and systematic process for continuous improvement predicated on examining through direct and indirect assessments whether students achieve the learning expectations in the programs in which they are participating. Therefore, when significant changes to the teaching and learning process occur, the AOL committee will consider the change and whether it should engender evaluation. The AOL committee is a standing committee within the DBMA that comprises faculty with training in student learning outcomes and assessment and program improvement. The AOL committee determined that an evaluation would be necessary to consider the impact and efficacy of the adoption. Accordingly, a research protocol was designed which included the collection of cost estimates from the University bookstore, examination of pass-fail rates, and distribution and analysis of student satisfaction and perceived learning efficacy survey. A survey method was selected because it enables scholars to explore social psychological phenomena with representative populations with valid and measurable queries (Visser et al., 2000).

SURVEY

Key areas that the survey should explore were identified and included student satisfaction, perceived learning efficacy, perception of multimedia and adaptive elements, ease of purchase and use, whether textbook costs were causing students to experience financial stress, and whether students with the most significant financial need benefited the most from the adoption. A survey was prepared within the Survey Monkey system that included a combination of dichotomous, Likert-scaled, ordinal, ratio,

short answer, and contingency questions. The Flesh Kincaid formula was applied to ensure readability for the population under consideration. Next, a basic psychometric review of the survey was conducted by a panel that included an assessment expert, an attorney, two subject matter experts, a psychologist, and a survey methodologist. The purpose of the panel was to examine the survey for validity and effectiveness and provide structured feedback to the researchers.

Finally, the survey was pilot-tested before implementation and then modified accordingly before widespread distribution to participants. In terms of sampling, the survey was administered to all students who had completed several required core courses. The courses selected were taught by experienced faculty who had agreed to be the first adopters of the system and who had previously participated in extensive training in student learning outcomes. After completing the courses, students were provided a link via email to complete the survey in Survey Monkey anonymously. The survey was administered from 2019-2020, overlapping with the onset of the Covid-19 pandemic. Approximately 427 students were invited to complete the survey with a response rate of >80%.

DATA ANALYSIS

After data collection was concluded, the data was imported to SPSS, where descriptive statistical analyses including mean, standard deviation, confidence interval at 95%, and skewness were calculated. Crosstabulations, Chi-squares, and Spearman's rank correlation co-efficient were conducted. Crosstabulations are contingency tables that allow people to examine relationships within the data that might not be readily apparent when only looking at total survey responses. A Chi-square is a common inferential statistical test used to examine the differences between categorical variables. This test aims to determine if a difference between observed data and expected data is due to chance or if it is due to a relationship between the variables. A Spearman's correlation determines whether there is a monotonic component of association between continuous or ordinal variables. Monotonic relationships occur when one thing goes up or down with the other. During the analyses, the following hypotheses were explored.

Research Question 1: Students are satisfied with the use of a digital learning platform in core management education courses.

This research question is influenced by the preponderance of existing research literature and considers student responses to a series of Likert-scaled questions included in the survey whereas if a mean of >3.0 were achieved, then the threshold for affirming the hypothesis is viewed as having been met.

Research Question 2: Management students attending a mid-Atlantic HBCU often struggle with the cost of textbooks.

This research question is predicated on an examination of enrollment and financial aid data across HBCUs and in particular the institution in question that indicated that the majority of students attending HBCUs have disproportionately greater financial needs (UNCF, 2016). It was explored in this study by considering student responses to a series of Likert-scaled questions whereas a mean of >3.0 was the threshold for affirming the hypothesis under consideration.

Research Question 3: Unlimited e-book subscription services are beneficial to students with financial concerns.

This research question was considered with student responses to two five-point Likert scaled questions, three Chi-Square tests with crosstabulations, and two Spearman's rank correlations.

FINDINGS

In this section, the data will be presented. In the following discussion section, the findings will be expanded upon, interpreted, and compared to the existing body of literature.

To examine the change in student performance, two courses taught by different instructors who had remained constant throughout the timeframe under consideration were selected for consideration. The pass rates for three semesters prior to implementation were calculated and averaged 77.7% across sections. Additionally, the three semesters following implementation were also considered and found to average 83.3% across sections. Accordingly, an overall positive increase in the course pass rate of 5.6% was noted for the courses under consideration.

The book store was contacted, and estimation was conducted to determine approximate savings following adoption. Initially, the DBMA was the exclusive early adopter on campus; however, courses in several other departments also adopted the system over time. Since customer names and majors could not be disclosed, only an overall estimation for an institution with around 2,600 undergraduate students and less than a sixth of departments adopting the system in at least one course could be provided. The bookstore considered average spending before and after adoption; they estimated that over \$133,000 of book fees had been saved in the three semesters since the Cengage Unlimited program was implemented.

The survey was distributed via the Survey Monkey online survey distribution and collection service. Students were sent an email inviting them to participate and their responses were recorded separately from any identifiers. A response rate of >80% was achieved. Approximately 1.2% of respondents were college freshmen, 24.8% were sophomores, 40.2% were juniors, 31.2% were seniors, and 2.6% responded other. The majority of respondents, 77.6%, said that they receive financial aid at the university with 21% responding negatively and 1.5% skipping the question. The academic classification and financial aid status results are represented in Table 1.

Table 1. Academic classification and financial aid status

Academic Classification		Frequency	Percent
Valid	Freshmen	4	1.2
	Sophomore	85	24.8
	Junior	138	40.2
	Senior	107	31.2
	Total	334	97.4
Missing	System	9	2.6
Total		343	100.0
I receive financial aid at this university		Frequency	Percent
Valid	Yes	266	77.6
	No	72	21.0
	Total	338	98.5
Missing	System	5	1.5
Total		343	100.0

All students participating in this study were enrolled in courses that required them to purchase Cengage Unlimited as each course used the digital learning and e-book system MindTap which was acquired through the Cengage Unlimited purchase. In each of the courses under consideration, at least 60% of the students' work for the term was completed and assessed in MindTap. Students were asked how they accessed MindTap with the option of selecting multiple methodologies. According to the respondents, 93.6% of students accessed MindTap through either a laptop or desktop, 21.9% used a tablet and 41.1% responded that they used a phone, with results shown in Table 2.

Table 2. Accessing course materials and enrolled course format(s)

How Did You Access MindTap	Laptop/Desktop	Tablet	Phone
Percentage	93.6%	21.9%	41.1%

A series of five-point Likert-scaled questions were posed where one equaled strongly disagree and five equaled strongly agree. The number of respondents, the mean, the standard deviation, the skewness, and the upper and lower confidence interval of the mean at 95% were recorded. The findings are discussed in the text and then visually displayed in tables.

Respondents were asked to reflect on the ease of purchasing Cengage Unlimited and the ease of accessing MindTap and its associated components. According to the participants, most students $\mu=4.162$ agreed that purchasing Cengage Unlimited was easy. Similarly, most students $\mu=4.1095$ agreed that they did not have any problems accessing course materials through MindTap. These results are presented in Table 3 and include mean, standard deviation, skewness, lower confidence interval at 95%, and upper confidence interval.

Table 3. Ease of purchasing and accessing Cengage Unlimited

	N	Mean	Std. Deviation	Skewness		95% Confidence Interval of the Difference	
				Statistic	Std. Error	Lower	Upper
I found purchasing Cengage Unlimited easy	336	4.1642	0.99996	-1.184	.133	4.0567	4.2716
I did not have any problems accessing my course materials via MindTap	338	4.1095	1.04349	-1.103	.133	3.9978	4.2211

A series of questions explored participants' overall views of e-books and whether those viewpoints were positive. The mean for the 4-question series was 3.7945 and the standard deviation was 1.03708. With respect to the individual questions, most students ($\mu=3.8427$) do not mind reading off a computer screen and will choose to purchase an e-book over a hardcopy ($\mu=3.504$). In addition, students reported that they like accessing e-books on their phones ($\mu=3.8635$). Finally, participants indicated appreciation for when e-books have a feature that reads text aloud to students ($\mu=3.9318$). These results are presented in Table 4 and include mean, standard deviation, skewness, lower confidence interval at 95%, and upper confidence interval.

Table 4. Perceptions of e-books

	N	Mean	Std. Deviation	Skewness		95% Confidence Interval of the Difference	
				Statistic	Std. Error	Lower	Upper
I do not mind reading off a computer screen	337	3.8427	1.02159	-1.012	.133	3.7333	3.9522
Whenever I have the option I will purchase an e-book over a hardcopy	337	3.5401	1.15433	-.390	.133	3.4164	3.6637
I like being able to access e-books on my phone	337	3.8635	1.03470	-.810	.133	3.7526	3.9744

	N	Mean	Std. Deviation	Skewness		95% Confidence Interval of the Difference	
				Statistic	Std. Error	Lower	Upper
I prefer when e-books have a feature that reads text aloud to students	337	3.9318	.93769	-.604	.133	3.8313	4.0322
		3.7945	1.03708				

Two questions explored whether students want to see more expanded adoption of the Cengage Unlimited program. With respect to the statement “I wish more of my courses would participate in the Cengage Unlimited program,” the majority of students ($\mu=4.2714$) indicated strong agreement with a standard deviation of .98364, a skewness of -1.354, a lower confidence interval of 4.1663, and an upper confidence interval of 4.3765. With respect to the statement “I would like the opportunity to purchase Cengage Unlimited for and have it applied to all of my courses” the majority of students ($\mu=4.2663$) indicated agreement with a standard deviation of 1.02206, a skewness of -1.458, a lower confidence interval of 4.1569, and an upper confidence interval of 4.3756. These findings are depicted in Table 5.

Table 5. Perception of Cengage Unlimited

	N	Mean	Std. Deviation	Skewness		95% Confidence Interval of the Difference	
				Statistic	Std. Error	Lower	Upper
I wish more of my courses would participate in the Cengage Unlimited program	339	4.2714	.98364	-1.354	.132	4.1663	4.3765
I would like the opportunity to purchase Cengage Unlimited for all my courses	338	4.2663	1.02206	-1.458	.133	4.1569	4.3756
		4.2689	1.00285				

Study participants had the opportunity to contribute reflective commentary on their experience with purchasing the Cengage Unlimited subscription and usage of the MindTap e-book and digital learning system. The prompt for the open-ended question was “Please, provide us with feedback regarding your experience with the Cengage Unlimited subscription and/or use of MindTap.” Student commentary was collected via a short answer comment box. The comments were considered and topic analysis was performed using the Survey Monkey machine learning sentiment analysis feature resulting in the identification of keyword frequency statistics as well as the formation of a word cloud generated based on the most commonly used terms. The word cloud is included as Figure 1 and shows predominantly positive feedback with the most commonly occurring terms being “thanks,” “saves money,” “MindTap,” “thank you,” and “easy.”



Figure 1. Word cloud

Research Question 1: Students are satisfied with the use of a digital learning platform in core management education courses

R1 posits that students are satisfied with using a digital learning platform integrated into their management courses. More specifically, it considers student satisfaction with the use of MindTap. The hypothesis is examined via students’ responses to nine five-point Likert-scaled questions that consider the ease of use of MindTap ($\mu=4.2908$), whether MindTap helped them stay on schedule ($\mu=3.9910$), if the MindTap Dashboard helped them keep track of due dates ($\mu=4.1141$), integration of the MindTap chapters and assignments ($\mu=4.2568$), preferring assignments and assessments in MindTap over those that are paper-based ($\mu=4.3802$), whether MindTap is well organized ($\mu=4.3522$), learning more as a result of MindTap ($\mu=4.0841$), liking that MindTap gives students multiple chances to submit work ($\mu=4.503$), and wishing that more instructors used MindTap ($\mu=4.3821$). The overall mean for the group was $\mu=4.2616$ and the standard deviation was 0.89871.

This particular subset of questions was also designed with the Cognitive Theory of Multimedia Learning in mind in particular the two questions that asked about staying on schedule and keeping track of due dates are based on the calendar and reminder features in MindTap and the multiple schedule/learning path viewing options available to students and the value of graphics and multiple visualizations in multimedia learning. The question that asked if the integration of learning tasks such as assignments and quizzes into the chapters is based on the notion that deeper learning occurs when information is presented in a dynamic manner that includes text, graphics, and hypermedia elements/actions that stimulate active learning. Finally, students were asked about their satisfaction with having multiple chances to submit work and receive personalized feedback with a customized study plan with individualized suggestions and then resubmit or retake assessments with scores only able to improve. Table 6 presents the responses for all nine questions under consideration for this research question and reports mean, standard deviation, skewness, lower confidence interval at 95%, and upper confidence interval.

Table 6. Research Question 1

		N	Mean	Std. Deviation	Skewness		95% Confidence Interval of the Difference	
					Statistic	Std. Error	Lower	Upper
1	I found MindTap easy to use	337	4.2908	.83006	-1.279	.133	4.2019	4.3797
2	MindTap helped me stay on schedule	335	3.9910	1.09568	-1.081	.133	3.8733	4.1088
3	The MindTap Dashboard helped me keep track of due dates	333	4.1141	1.00550	-1.304	.134	4.0057	4.2225

		N	Mean	Std. Deviation	Skewness		95% Confidence Interval of the Difference	
					Statistic	Std. Error	Lower	Upper
4	I like that in MindTap my chapters and assignments are integrated	331	4.2568	.87935	-1.306	.134	4.1617	4.3519
5	I would rather have a quiz/assignment in MindTap than a paper test in class	334	4.3802	.79546	-1.403	.133	4.2946	4.4659
6	MindTap is well organized	335	4.3522	.83780	-1.569	.133	4.2622	4.4423
7	MindTap helped me learn more in my course	333	4.0841	1.01739	-1.171	.134	3.9744	4.1938
8	I liked that in MindTap I had multiple chances to submit my work	334	4.5030	.74636	-1.602	.133	4.4227	4.5833
9	I wish more of my instructors used MindTap	335	4.3821	.88075	-1.542	.133	4.2874	4.4767
			4.2616	0.89871				

Research Question 2: Management students attending a mid-Atlantic HBCU often struggle with the cost of textbooks

R2 posits that management students attending a mid-Atlantic HBCU often struggle with the cost of textbooks. It is explored by considering the responses to three 5-point Likert scaled agreement statements, which were paying for books is a concern ($\mu=3.8108$), there are semesters where they had difficulties purchasing books for their classes ($\mu=3.7663$), and they believe that textbooks cost too much ($\mu=4.5280$). The overall mean for the set is $\mu=4.035$ with a standard deviation of 1.03729. Table 7 presents the responses for the three questions under consideration for this hypothesis and reports mean, standard deviation, skewness, lower confidence interval at 95%, and upper confidence interval.

Table 7. Research Question 2

	N	Mean	Std. Deviation	Skewness		95% Confidence Interval of the Difference	
				Statistic	Std. Error	Lower	Upper
Paying for books is a concern for me	339	3.8108	1.13153	-.714	.134	3.6888	3.9328
There are semesters where I have had difficulties purchasing books for my classes	339	3.7663	1.16901	-.691	.133	3.6412	3.9328
I believe that college textbooks cost too much	339	4.5280	.81132	-1.980	.132	4.4413	4.6147
		4.035	1.03729				

Research Question 3: Unlimited e-book subscription services are beneficial to students with financial concerns.

R3 posits that unlimited e-book subscription services are especially beneficial to students with financial concerns. This hypothesis was considered with student responses to two 5-point Likert scaled questions, three Chi-Square tests with crosstabulations, and Spearman rank correlations. The two Likert scaled statements considered whether e-books help students save money ($\mu=4.0238$) and whether the Cengage Unlimited program helps students save money on the cost of textbooks ($\mu=4.2124$). The Chi-Square tests and crosstabulations explore participants’ responses to the statement “there are semesters where I have had difficulties purchasing books for my classes” and students’ strength of agreement to the statements “the Cengage Unlimited plan helps students save money on the cost of books” and “e-books help students save money.” In all instances, $p<.05$. Correlations found in all cases were significant at the .01 level (2-tailed). The results are presented in Table 8.

Table 8. Research Question 3

		N	Mean	Std. Deviation	Skewness		95% Confidence Interval of the Difference	
					Statistic	Std. Error	Lower	Upper
E-books help students save money		339	4.023	.93011	-.809	.133	3.9240	4.1236
The Cengage Unlimited plan helps students save money on the cost of books		339	4.212	.97408	-1.306	.132	4.1083	4.3165
			4.1181	0.9521				
Chi-Square and Crosstabulations								
		The Cengage Unlimited plan helps students save money on the cost of books					Sum	
		Strongly Disagree	Disagree	Neutral/ Undecided	Agree	Strongly Agree		
There are semesters where I have had difficulties purchasing books for my classes	Strongly Disagree	1	0	3	5	6	15	
	Disagree	1	2	8	17	15	43	
	Neutral/ Undecided	4	0	17	18	21	60	
	Agree	0	1	20	45	42	108	
	Strongly Agree	3	2	9	13	85	112	
Total		9	5	57	98	169	338	
Pearson Chi-Square	Value	df	Asymptotic Significance (2-sided)					
	64.766 ^a	16	.000					
		E-books help students save money					Sum	
		Strongly Disagree	Disagree	Neutral/ Undecided	Agree	Strongly Agree		
There are semesters where I	Strongly Disagree	1	6	1	2	5	15	
	Disagree	1	3	8	24	7	43	

have had difficulties purchasing books for my classes	Neutral/ Undecided	1	0	22	21	15	59
	Agree	1	1	20	50	35	107
	Strongly Agree	0	8	12	34	57	111
Total		4	18	63	131	119	335
Pearson Chi-Square	Value	df	Asymptotic Significance (2-sided)				
	86.564 ^a	16	.000				
Correlation							
			There are semesters where I have had difficulties purchasing books for my classes	Paying for books is a concern for me.	E-books help students save money.	The Cengage Unlimited plan helps students save money on the cost of books	
Spearman's rho	There are semesters where I have had difficulties purchasing books for my classes	Correlation Coefficient	1.00	.695**	.252**	.299**	
		Sig (2-tailed)		<.001	<.001	<.001	
		N	338	332	338	338	
Spearman's rho	Paying for books is a concern for me.	Correlation Coefficient	.695**	1.00	.314**	.345**	
		Sig (2-tailed)	<.001		<.001	<.001	
		N	338	333	330	333	
Spearman's rho	E-books help students save money.	Correlation Coefficient	.252**	.314**	1.00	.597**	
		Sig (2-tailed)	<.001	<.001		<.001	
		N	338	330	336	336	
Spearman's rho	The Cengage Unlimited plan helps students save money on the cost of books	Correlation Coefficient	.299**	.345**	.597**	1.00	
		Sig (2-tailed)	<.001	<.001	<.001		
		N	338	333	336	339	
**Correlation is significant at the .01 level (2-tailed)							

DISCUSSION

In order to consider the impact on student achievement, pass-fail rates were considered. For the two courses under consideration, one of which was offered entirely online and the other which was offered in person, a modest but measurable positive increase in pass rate occurred in the three semesters following adoption. This increase was considered an encouraging indication that unlimited access to e-books and instructional enhancements increases student success. However, it may also be worthy to note that examination of pass-fail rates overlapped with the onset of the Covid-19 pandemic, where a dip in student performance occurred.

Analyses and interpretations of the findings informed the researchers that most students accessed the Cengage MindTap digital learning solution on a laptop followed by a phone with few students using tablets. In terms of ease of purchase, students expressed that purchasing their Cengage Unlimited books was easy and that they had no problems accessing MindTap materials and services. Students also responded that they do not mind reading off a screen, will purchase an e-book over a hardcopy when presented with the option, like having the option of accessing their books on their phone, and appreciate when e-books have a screen reader feature. Finally, respondents would like to see greater adoption of the Cengage Unlimited system and see it applied to all of their courses.

The first research question, R1, posits that students are satisfied with using a digital learning platform built around an e-book integrated into core management courses. Student satisfaction with digital learning platforms is primarily well-established in the literature, and as such, this hypothesis further validates existing knowledge. Specifically, hypothesis one considered student satisfaction with the use of the MindTap platform and was evaluated by considering participants' responses to nine five-point Likert-scaled questions. The means for all questions were $\mu > 3.0$. As a result of the means exceeding the > 3.0 threshold used to test R1, it is viewed as being affirmed and these findings are consistent with the findings of similar studies conducted at the same minority-serving institution under consideration, including Buzzetto-More (2015), Buzzetto-More and Mitchell (2009), and Buzzetto-More and Ukoha (2009). When compared with the broader body of literature, these findings are also consistent with multiple prior studies that have found that interactive e-book technologies can reinforce student learning, assist with assignments, help students develop confidence about the subject matter, and provides students with meaningful feedback (Asrowi et al., 2019; Y. Huang et al., 2012; Karakoç Öztürk, 2021; Schwan & Riempp, 2004; Tung & Deng, 2006).

Why does an e-book digital learning platform enhance perceived learning efficacy? The authors suggest that the answer can be found by considering the Cognitive Theory of Multimedia Learning. More specifically, four questions that were included within the R1 question subset looked at the multimedia reminder, organizational, and learning path visualization features; integration of text with dynamic elements and required student action; and ability to have multiple attempts to submit work that include personalized and adaptive feedback. According to the Cognitive Theory of Multimedia Learning, deeper learning occurs when information is presented in a dynamic manner that includes text, graphics, and hypermedia elements/actions that stimulate active learning over when static text-based content is presented to learners (Mayer, 2014). The literature supports this assertion (Bozkurt & Bozkaya, 2015; Buzzetto-More, 2015; Ciampa, 2012; Y. Huang et al., 2012; Karakoç Öztürk, 2021), which links interactive e-book systems to active learning supported by multi-media multi-sensory engagement with content.

Individuals in academia have recognized the high cost of textbooks for some time, and in recent years a handful of studies have explored the impact of textbook costs on students with findings that show that the exorbitantly high cost of traditional textbooks is a barrier in higher education that most adversely impacts low-income, underrepresented minority groups (Cengage, 2018; Curry, 2021; DeNoyelles & Raible, 2017; Griffiths et al., 2018). With their history unique to the United States, HBCUs are specifically purposed to serve Black, first-generation, low-income, and other underrepresented groups of learners. However, examinations of the financial status and economic well-being of

HBCU students have found that HBCU learners have disproportionately greater financial needs, borrow student loans at higher rates, and, consequently, graduate with substantially higher debt than their non-HBCUs peers despite lower tuition rates at HBCUs (UNCF, 2016).

The second research question covered in this study, R2, was inspired by the research on the negative impact of textbook costs on minority and underrepresented learners. More specifically, R2 is predicated on the notion that management students attending a mid-Atlantic HBCU often struggle with the cost of textbooks. R2 two was examined by considering participant responses to three five-point Likert-scaled agreement statements. For all three questions, the means were $\mu > 3.0$ and as a result R2, it is viewed as being affirmed. Management students attending a mid-Atlantic HBCU often struggle with the cost of textbooks. More precisely, management students attending a mid-Atlantic HBCU believe that college textbooks cost too much, are often concerned about paying for books, and have had semesters where they had difficulties purchasing their required textbooks. These findings are similar to what has been reported in the literature by Curry (2021), Cengage (2018), and Griffiths et al. (2018).

Many institutions have recognized that the high cost of textbooks can be a barrier to student success in higher education that contributes to educational inequities. As such, exploring and experimenting with various mechanisms for acquiring affordable course content is an ongoing process. The third research question, R3, explored the notion that unlimited e-book subscription services are especially beneficial to students with significant financial concerns. This research question was considered with student responses to five-point Likert scaled questions, Chi-Square tests with crosstabulations, and Spearman's rank correlations. Both Likert scaled statements had a mean $\mu > 3.0$, with students reporting that the Cengage Unlimited plan helps students save money on the cost of books and e-books help students save money. The crosstabulations and Chi-Square tests specifically explored whether students who expressed that they have struggled to purchase textbooks were more likely to feel strongly about the positive cost-saving benefits of e-books. P-value was considered, and in all cases, $p < .05$. Correlations found in all cases significance at the .01 level (2-tailed). Based on the analyses of this data, hypothesis three is viewed as being affirmed and is consistent with the findings of studies by Baron et al. (2017) and Wook et al. (2014), who found those cost savings were the primary drivers for students' preference for e-book adoption as well as the work of Griffiths et al. (2018) who found that non-traditional book adoptions result in substantial cost savings for students. Finally, these findings are further supported by estimates from the University bookstore, which found that students at the institution during the period under consideration had saved over \$133,000 in book fees.

The participant commentary collected via a comment box included in the survey provided primarily positive feedback. Samples of the commentary collected are as follows and lead one to believe that students found MindTap easy to use and helpful and that they appreciated the monetary savings associated with the Cengage Unlimited program.

*I appreciate the convenience of MindTap
The programs are very helpful and help save money for those of us who pay their way through school.
I liked using MindTap, it was really insightful.
They are a wonderful study tool with lots of information available and easy to access.
Get more books that professors use on there
I wish all my teachers used Cengage.
It is really helpful I hope other teacher(s) can use it to help us Thank you
Awesome tool, and money saver I was very grateful to have it.
I enjoyed the MindTap system for homework and for studying
It is very interesting knowing Mind tap and Cengage unlimited for the first time. It was very easy accessing it.
Thank you for helping me to save money
I hope that all teachers at UMES use Mind Tap Cengage Unlimited from now on
Keep up the great work! Get more instructors to adopt Cengage Unlimited. Put MindTap in all my courses.*

*Program is very easy to use and helped me throughout the course. Wish all my online courses would use it
Try to get all teachers to use it*

LIMITATIONS

The greatest limitation of this study is that is focused exclusively on students attending a single institution. However, at the same time, this study provides research on a population that is expanding in numbers in higher education and that the research, reports may be under-prepared for academic success (Buzzetto-Hollywood, Quinn, Wang, & Hill, 2019; Quinn & Buzzetto-Hollywood, 2019). Additionally, this paper builds on the findings of the studies that have been conducted at majority serving institutions.

A secondary limitation of this study is that the end of the study overlapped with the Covid-19 pandemic and the global pivot to remote instruction. In conjunction with the pivot, student performance in courses decreased and that negatively impacted the pass-fail rates that were collected and considered as a measure of impact. Nonetheless, a 5.6% increase in the pass rate for the three semesters following adoption was recorded.

A third limitation of this study is that the bookstore could not disclose customer names, nor do they have the customer's major field of study noted. This meant that only an overall estimation for an institution with around 2,600 undergraduate students and less than a sixth of departments adopting the system in at least one course could be provided.

CONCLUSION

The Covid-19 pandemic forced higher education to make a sudden pivot to remote instruction that included a sharp upsurge in the adoption of e-learning and e-book resources as institutions struggled to deliver quality instruction (Dignan, 2020; Govindarajan & Srivastava, 2020; Lederman, 2020). The result of these changes has significantly lowered the psychological barriers to the use of e-learning resources among parents, students, faculty, and university leaders (Govindarajan & Srivastava, 2020), with a growing number of students and institutions perceiving digital learning solutions as more valuable than traditional textbooks (Lambert, 2020). Further, institutions also recognize that the high cost of traditional textbooks can be a barrier to student success in higher education that contributes to educational inequities (Curry, 2021; Griffiths et al., 2018).

For these reasons, a spotlight has now been firmly placed on the need to understand better the implications and options available in the e-book market. The aim of this study, conducted at a minority-serving institution that serves primarily first-generation and lower-income learners, is to explore the impact of, and student satisfaction with, a one-price-per-semester unlimited e-book subscription service that includes a number of embedded interactive features, student learning activities, and learning outcome assessments. The purpose of the paper is to inform individuals in higher education so that they can make knowledgeable decisions when considering the adoption of similar systems. This paper also contributes significantly to the literature as it includes a population that is frequently neglected in studies that primarily are concentrated at traditionally white institutions (TWIs) with low enrollments of Black students.

The study presented in this paper explored an unlimited e-book subscription service with digital learning features adopted by a Mid-Atlantic HBCU. A mixed-method quantitative approach was employed to consider pass-fail rates for selected early adoption courses and administration of student satisfaction and perceived learning efficacy survey. The survey included a combination of multiple responses, Likert-scaled, dichotomous, open-ended, and ordinal questions. The data was subsequently exported to SPSS, where descriptive statistical analyses including mean, standard deviation,

confidence interval at 95%, and skewness were calculated. In addition, Chi-Square and crosstabulations were performed, and Spearman rank correlation coefficients were used to examine the relationship between financial need and perceptions of the system under consideration.

According to the findings, an overall positive increase in course pass rates was found, most students have been concerned about paying for books in the past, feel that college textbooks cost too much, believe that the Cengage Unlimited plan helps students save money, and would like to see subscriptions like Cengage Unlimited adopted in all of their classes. With respect to MindTap, the students found this digital learning solution easy to use, liked the Readspeak feature, appreciated the integrated interactive features, and believed the system helped them learn more and stay on schedule and would like to see MindTap adopted in more of their classes. When correlations, crosstabulations, and Chi-Square tests were conducted, students who indicated having the most significant financial concerns were stronger in their satisfaction with the unlimited e-book subscription plan and most likely to see a similar plan adopted in all of their courses. These findings are consistent with the literature that reports that interactive e-book technologies support active learning as explained by the Cognitive Theory of Multimedia Learning (Bozkurt & Bozkaya, 2015; Buzzetto-More, 2015; Ciampa, 2012; Y. Huang et al., 2012; Karakoç Öztürk, 2021; Rockinson-Szapkiw et al., 2013); save learners money (Curry, 2021; Griffiths et al., 2018); are perceived favorably (Baron et al., 2017; Wook et al., 2014); and can positively reinforce student learning and improve learner outcomes (Asrowi et al., 2019; Buzzetto-More & Ukoha, 2009; Y. Huang et al., 2012; Karakoç Öztürk, 2021; Schwan & Riempp, 2004; Tung & Deng, 2006).

This study implies that the adoption of an unlimited e-book subscription that includes access to high-quality digital learning resources positions higher education institutions well in the instance of a global pandemic or other catastrophic events that cause the sudden pivot to remote instruction. Additionally, such a system has both a positive impact on student achievement and is perceived favorably by students. Further, adopting a low-cost subscription option is particularly beneficial to students who struggle financially.

To better meet the needs of students, remove barriers to student success, and improve student learning outcomes, universities must play a role in delivering affordable course content. Further, the global pandemic has forced institutions to consider the benefits of integrated digital learning solutions, which are increasingly being viewed as more valuable than traditional textbooks due to selling for much less, having high acceptability by today's learners, and active learning benefits. The institution where this study was conducted will continue to use Cengage digital learning solutions in many of their courses; however, the University has chosen to adopt Barnes and Noble First Day Complete campus-wide starting in the Fall of 2022. With this program, students will receive required course materials – in both digital and/or physical format before the first day of class bundled as part of tuition or course charges and based on credit load.

The authors will continue to research the impact of educational innovations and interventions on historically underrepresented students and hope that more institutions will engage in similar activities. To this end, it is the goal of the authors to partner with scholars at a broad range of institutions so as to further this line of inquiry. More specifically, the authors plan to explore student usage of, and interaction with, the digital learning e-book solution as well as its impact on student comprehension, organization, perceived-self efficacy, and engagement.

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