

Applying Balanced Scorecard to Blackboard Technology in Accounting Education

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ABSTRACT

The objective of this study is to use balanced scorecard (BSC) to measure the performance of accounting students when instructors utilize Blackboard to teach courses. A framework was designed to show the relationships between the BSC's four interrelated business perspectives and the use of Blackboard in accounting education. Content analysis was used to process in-depth interview data that were collected from 13 accounting students of a college of business in the US. The results show that three of the four Blackboard-supported BSC perspectives (internal process, student value proposition, and financial) have an impact on accounting students' academic performance. However, the impact of the fourth Blackboard-supported BSC perspective (learning and innovation) on accounting students' academic performance is different because the accounting career is a continuous learning endeavor. The changing and evolving nature of the Blackboard technology does not fit into the evolution of accounting principles, regulations, and laws.

KEYWORDS

Accounting Education, Balanced Scorecard, Blackboard Technology, Performance, Student

INTRODUCTION

To overcome a declining retention rate in accounting courses and to attract more of its students to become accounting majors without sacrificing student learning or increasing costs (C. Spiceland, J. Spiceland, & Schaeffer III, 2015; Watty, McKay, & Ngo, 2016; Ersoy-Babula, & Babula, 2018), many accounting institutions have adopted Blackboard technology to deliver courses (L. Lawson-Body, Willoughby, A. Lawson-Body, 2015; Clark-Gordon, Bowman, Hadden, & Frisby, 2019). Academic executives have been giving increased attention to the measurement of accounting students' performance through the use of interactive learning technologies, which are heavily used in accounting education (Özpeynirci, Yücenurşen, Apak, & Polat, 2015; Watty et al., 2016). Blackboard technology is becoming a teaching method used to adapt online learning instructions to the needs of accounting students (Basioudis & de Lange, 2009; Wilson, 2013; L. Lawson-Body et al., 2015; Gibeault, 2018).

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Today, every reputed educational institution run their online learning courses and hybrid learning courses (traditional face-to-face courses delivery combined with online learning courses) under the electronic learning (e-learning) system (Zhang, Zhou, Briggs, & Nunamaker Jr., 2006; Delen, Liew, & Willson, 2014; Alenezi & Shahi, 2015; Navimipour & Zareie, 2015; Gibeault, 2018; Gavaldon & McGarr, 2019; Clark-Gordon et al. 2019; Salama, Iskandara, Ibrahima, & Farooq, 2019). Many instructors use Blackboard to monitor students' progress carefully and to boost students' performance (Gibeault, 2018; Fluck, 2019). These benefits of the use of Blackboard have been diversely appreciated because some learners are dissatisfied with their e-learning experience (Liaw, 2008; Gibeault, 2018). That raises a critical issue of how the use of Blackboard contributes to the academic performance of accounting students, because accounting education continues after the graduation of accounting students. Many students struggle with the analytical thinking process required in accounting (C. Spiceland et al., 2015). Without a strong motivation to apply the extra time they may need to be successful in accounting, students will often get discouraged and stop trying (C. Spiceland et al., 2015; Watty et al., 2016). What matters for most accounting students is not the degrees delivered by the academic institutions, rather it is to maintain certification through continued education.

The measurement of the accounting student's performance is increasingly becoming a challenge for many educational institutions using Blackboard. Finding the most appropriate approach to measure accounting students' performance by taking into account various factors is not an easy task for the executives in education. These difficulties brought our attention to the use of the balanced scorecard (BSC) because according to a recent survey of more than 1000 organizations, 80% of the organizations that regularly use the BSC reported improvements in operating performance and 66% of them also reported an increase in profits (Rabbani, Zamani, Yazdani-Chamzini, & Zavadskas, 2014; Dincer, Yuksel, & Martinez, 2019). The BSC outlines four performance indicators as the drivers of future overall organizational performance (Kaplan & Norton, 1992; Kaplan & Norton, 2000; Aljardali, Kaderi, & Levy-Tadjine, 2012; Sainaghi, Phillips, & d'Angella, 2019): customer perspective, internal perspective, innovation and learning perspective, and financial perspective. Some indicators are dedicated to measure an organization's performance based on the short term drivers of success; other indicators measure the long term drivers of success (Kadárová, Durkáčová, & Kalafusová, 2014; Xia, Yu, & Gao, 2017; Dincer et al., 2019).

The literature outlined the application of BSC in education (Wu, Lin, & Chang, 2011; Aljardali et al, 2012; Özpeynirci et al., 2015) at many occasions. Aljardali et al. (2012) developed a framework for the implementation of the BSC in Higher Education Institutions. They adapted BSC to the Lebanese higher education system in order to facilitate the overall organizational performance measurement. Wu et al. (2011) developed performance evaluation indices based on BSC for extension education centers in universities by utilizing multiple criteria decision making. They found that the learning and innovation perspective of BSC is the significant influential factor that would affect the other three perspectives. In addition, they discovered that the internal process perspective of BSC as well as the financial perspective of BSC play important roles in the performance evaluation of extension education centers. Lawrence & Sharma (2002) utilized Habermas's critical theory of societal development to evaluate the incidence of total quality management (TQM) and BSC implementation in corporate universities. They found that treating education as a private good, and students as customers, is a constitutive re-ordering of university life, and a potential degradation of its function in society. Ozpeynirci et al. (2015) used BSC as a technique for comparing the goals with the activities and evaluating of outputs in a university in Turkey. They divided accounting education following the four perspectives of the BSC and used a survey to collect data from students who were taking accounting courses in the university. They found that the students did not gain the skill needed for their professional careers when they applied the internal process perspective. They found that the financial perspective of BSC can be used as a performance indicator for using more efficiently the resources, rather than for making financial profit, because the university is a non-profit institution. They found that the customer perspective of BSC allowed that university to determine which courses increase the level of knowledge

of the students. Finally, they found that there was no continuous education learning opportunity for the students when they applied the learning and innovation perspective. But still, those authors did not use the BSC to measure accounting students' academic performance when Blackboard is used.

In addition, not much is known about the use of BSC to measure the effect of the use of Blackboard on the performance of accounting students. BSC can be used as a tool for measuring the students' performance in accounting education (Özpeynirci et al., 2015; Lin, Hu, Tseng, Chiu, & Lin, 2016; Guerra, Garcia, Lima, Barbosa, Heerdt, & Berchin, 2018). Therefore, the objective of this study is to use BSC to measure the performance of accounting students when Blackboard technology is used to teach accounting courses.

The main contribution of this paper is to propose a theoretical framework that can serve as a guide to measure the performance of accounting students when instructors utilize Blackboard to teach courses in universities. The framework was designed to show the blackboard-supported BSC's four interrelated business perspectives.

This paper is organized as follows: the second section bears on the literature review, the theoretical background, and the framework. The third section addresses the case background. The fourth section outlines the research design and procedures. The fifth section provides the analysis. The sixth section deals with the findings. The seventh section addresses the discussion, and the last part presents the conclusion and implications.

LITERATURE REVIEW

Blackboard Technology and Accounting Student Performance

Blackboard is the web-based learning management system (LMS) designed to support fully online course interactions (Griffith, Sawyer, & Neale, 2003; Liaw, 2008; Basioudis & de Lange, 2009; Wilson, 2013; Gibeault, 2018; Gavaldon & McGarr, 2019). Blackboard allows students to obtain desired qualifications or degrees even without attending any face-to-face classes in educational institutions (Alenezi & Shahi, 2015). Blackboard is also a tool that allows faculty to add resources for students to access online and has some features for students to enhance learning efforts (Griffith et al., 2003; Gibeault, 2018). The effective utilization of the Blackboard learning system mainly depends on students and faculty members' backgrounds, readiness, and acceptance of such a system (Bhagwat & Sharma, 2007; Estriegana, Medina-Merodio & Barchino, 2019).

The higher education profession, including accounting education, has responded to instructor and student needs with course management technology such as Blackboard (Wilson, 2013). Many empirical studies involving the use of Blackboard have been conducted in higher education in general and in accounting education in particular.

In the higher education system, e-learning, such as Blackboard, has been playing a major role (Navimipour & Zareie, 2015). When technology is used in innovative ways it can lead to improvement in learning and teaching (Dufner, Holley, & Reed, 2002; Gavaldon & McGarr, 2019). Navimipour & Zareie (2015) explored how to enhance employees' satisfaction by means of e-learning systems. They studied what kinds of teaching activities are effective to increase e-learning satisfaction. They provided a framework for assessing the impact of e-learning on employees' satisfaction. They found that the following four variables: technology, educational content, motivation, and attitude significantly influenced employees' learning satisfaction. Zhang et al. (2006) empirically examined the influence of interactive video on learning outcomes and learner satisfaction in e-learning environments. They found that students in the e-learning environment that provided interactive video achieved significantly better learning performance and a higher level of learner satisfaction than those in other settings. Delen et al. (2014) investigated the effects of a newly designed enhanced video learning environment, which was designed to support or scaffold students' self-regulated or self-directed learning, on students' learning behaviors and outcomes. They found that the newly designed enhanced video learning

environment was a superior instructional tool compared to the common video learning environment in terms of students' learning performance.

Online learning often requires students to be self-directed and engaged in their learning. Delen et al (2014) found that self-regulated learning (SRL) involved effective use of cognitions, behaviors, and emotions to achieve learning goals. Delen et al (2014) found that self-regulated learners knew how and when to use meta-cognitive strategies such as self-monitoring and self-evaluation for optimal learning and successful performance. Moreover, Merkt & Schwan (2014) found that practice questions supported students' self-regulation while watching instructional videos. They also found that the poor quality of the e-learners' environment did not guarantee that e-learners would have better learning performance. Chen & Wu (2015) examined exactly how different video lecture types affected online learning performance. They found that while the video lecture types enhanced learning performance, learning performance with lecture capture and picture-in-picture types were superior to that associated with the voice-over type.

In accounting education, many authors have analyzed the relationship between the use of Blackboard and students' performance. For instance, Holtzblatt & Tschakert (2011) conducted a study on students' needs of online videos in accounting classes and suggested that online video clips, student video projects, and online video lecture recordings hold great promise for accounting education (Holtzblatt & Tschakert, 2011). Lin, Wu, & Hsueh (2014) examined the influence of an affective tutoring system (ATS) in accounting on learning effectiveness and usability. Affective computing is the study of interactions between humans and computers; it primarily considers computers that recognize emotions. They found that the main benefit of using ATS in accounting curriculum is high learning performance. Lillies & Wygal (2011) reported on the development and use of a "Virtual Office Hours" (VOH) platform to enhance opportunities to engage accounting students in their learning beyond the classroom environment. They implemented VOH in auditing and intermediate accounting courses to develop clear and assured lines of communication between the student and instructor, and to foster the use of information technologies in the accounting course learning environment. Carnaghan, Edmonds, Lechner & Olds (2011) found that the adoption rate in accounting classes is very low for Student Response Systems (SRS) based on the use of a mobile device. They developed a guide for accounting faculty who are considering using SRSs, and for experienced students who seek to refine or expand their SRS use. Basioudis & de Lange (2009) investigated the impact of design features of Blackboard used as a Web-based Learning Environment (WBLE) in teaching undergraduate accounting students. They found that accounting student satisfaction with the use of a WBLE was associated with five design features. These include usefulness and availability of lecture notes, online assessment, model answers, and online chat. J. Spiceland et al. (2015) examined the utilization of a variety of stimulating and effectual technological enhancements to engage students and foster an active learning environment in the course. They found that the redesign endeavors have increased performance, enhanced student retention, and stimulated growth in the number of accounting majors relative to enrollment growth in the college of business. Keller, Hassell, Webber & Johnson (2009) did a comparison of accounting students' academic performance in two sections of the principle of managerial accounting course, one held in a traditional format (classes held two days per week in a classroom setting) and one in a hybrid format (one class period held in a classroom setting and one in a web-based environment). They found that accounting students' academic performance was not significantly associated with class delivery format (traditional or hybrid).

The importance of the use of Blackboard to boost accounting students' performance has been demonstrated in the literature, still the measurement of that performance using a well-known appropriate tool is missing. Actually, the measurement of the academic performance of accounting students who are taking accounting courses using Blackboard was limited to the use of GPA. Our research is challenging that view by also introducing BSC as a measurement tool for accounting students' performance when Blackboard technology is utilized to deliver accounting courses, which require strong analytical skills.

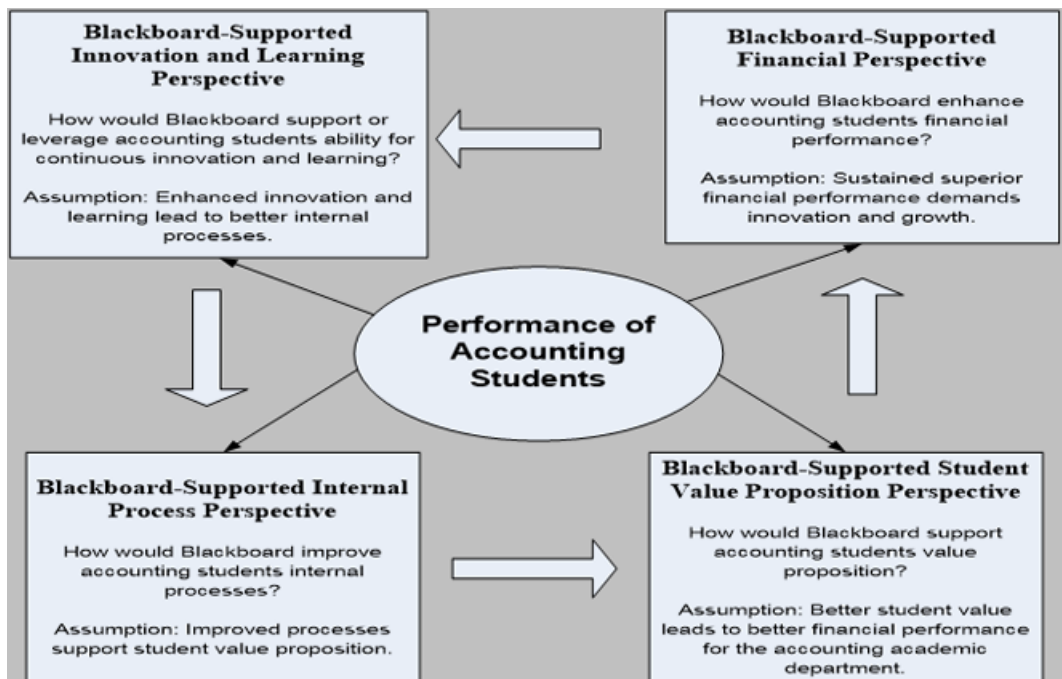
The Hypotheses Development

In the framework shown in Figure 1, the accounting student performance is measured by BSC. Mainly the framework is materializing the relationships between the use of Blackboard and the four interrelated perspectives of BSC. Because these four interrelated perspectives are supported by Blackboard used by the accounting students to receive accounting lessons and course materials, they are adapted as follows: Blackboard-supported innovation and learning perspective, Blackboard-supported internal process perspective, Blackboard-supported student value proposition perspective, and Blackboard-supported financial perspective.

Blackboard-Supported Innovation and Learning Perspective

The learning and innovation perspective is about creating an appropriate environment for creativity and growth (Seyedhosseini, Taleghani, Bakhsha, & Partovi, 2011; Dincer et al. 2019). This perspective of BSC identifies the infrastructure that the organization must build to create long-term growth and improvement (Seyedhosseini et al. 2011; Chytas, Glykas, & Valiris, 2011; Dincer et al. 2019). The learning and innovation perspective contains measures, such as student skills and computerization knowledge (Ekmekci, 2014). Guerra et al. (2018), created and adapted a strategy map for environmental education based on balance scorecard and found that learning and environmental growth is part of their strategy map. This perspective mainly focuses on factors that facilitate continuous learning and improvement in the academic institutions (Ekmekci, 2014). Also, the use or adoption of the appropriate Blackboard technology facilitates the training and learning process of the students (Ozpeynirci et al. 2015; Salama et al. 2019). Frequent renewal and continuous upgrades of Blackboard technology such as new hardware and infrastructure, are also related to the learning and innovation perspective of BSC (Navimipour & Zareie, 2015). This suggests the following hypothesis:

Figure 1. Blackboard-Supported Balanced Scorecard Framework



H1: The Blackboard-supported learning and innovation perspective will have a positive effect on accounting students' performance.

Blackboard-Supported Internal Process Perspective

The internal process perspective is about improvement in operational processes in order to make progress in quality (Seyedhosseini et al. 2011). According to Kaplan and Norton (2000), in the internal process perspective, executives identify the critical internal processes in which the organization must excel (Seyedhosseini et al. 2011; Chytas et al. 2011; Guerra et al. 2018; Dincer et al. 2019).

The internal process of BSC allows for identifying the business processes in which the academic institutions can excel in order to drive value for students and at the same time provide student satisfaction (Ozpeynirci et al. 2015). These measures are utilized to identify core competencies, recognize strengths and shortcomings, and make improvements (Ekmekci, 2014). Thus, we propose the hypothesis below:

H2: The Blackboard-supported internal process perspective will have a positive effect on accounting students' performance.

Blackboard-Supported Student Value Proposition Perspective

In the education sector, BSC has various performance metrics for its student perspective such as student retention, new student acquisition, and student success. These performance metrics constitute the base of the student's value proposition perspective of BSC. There are many competitive technologies available on the e-learning technology market (Alenezi & Shahi, 2015; Salama et al. 2019; Fluck, 2019; Clark-Gordon et al. 2019). The selection of e-learning technology such as Blackboard should be determinant in the students' selection of an accounting academic institution. Blackboard that has a recording feature for guest speakers or teachers' presentations seems to be valuable for students. Accordingly, it is hypothesized that:

H3: The Blackboard-supported student's value proposition perspective will have a positive effect on accounting students' performance.

Blackboard-Supported Financial Perspective

The financial perspective is about generating high income, profit and improvement in financial measures of BSC (Seyedhosseini et al. 2011; Wu & Chang, 2012; Dincer et al. 2019; Sainaghi et al. 2019). Guerra et al. (2018), found that economic and financial responsibility is one of the five dimensions of balance scorecard which contributes to the environmental education program at universities. This perspective focuses on the financial expectations of stakeholders (Rabbani et al. 2014) who are the executives of the academic institutions and the chairs of accounting academic departments. Blackboard aims to provide a configurable infrastructure that integrates learning material, tools, and services into a single solution to create and deliver educational content quickly, effectively, and economically (Ong et al. 2004; cited in Zhang et al. 2006). The use of Blackboard should also decrease cost associated with paperwork. For instance, e-textbooks or digital textbooks available on Blackboard are much cheaper than hardcopy textbooks (Wilson, 2013; Salama et al. 2019; Fluck, 2019). Therefore, we propose the following hypothesis:

H4: The Blackboard-supported financial perspective will have a positive effect on accounting students' performance.

RESEARCH DESIGN AND PROCEDURES

Case Background

We concentrated our research on a sample of students majoring in accounting in the accounting academic department of a public university in the US. The university is the state's oldest academic institution, with nearly 15,000 students and more than 225 fields of study including bachelor's, master's, doctoral, law, and medical degrees. The university offers about 3,000 courses, more than 40 online degree programs, and 84 graduate education programs. The university has 9 academic colleges and schools including the college of business and public administration (CBPA) where the accounting academic department under study is located. The CBPA is accredited by the Association to Advance Collegiate Schools of Business (AACSB).

Research Design

A qualitative study was performed to meet the goal of this study. The authors began the study to find the factors that may emerge in the use of Blackboard to impact the performance of accounting students. In order to satisfy the objective of this study, data were collected using interviews from a sample of accounting students who were attending the AACSB accredited CBPA. The results of these investigations were added to the findings from the literature review related to Blackboard, BSC, and accounting students' performance to set up an interview guide.

Site Selection

The accounting academic department of the CBPA has been selected for investigation because it provides interesting insights to how an academic institution implemented Blackboard to support its students' performance. Also, Blackboard is used extensively in all accounting courses in the accounting academic department of the CBPA. The participants were selected students who were majoring in accounting. The focus was on two groups of participants: students who were in the lower level or introductory accounting courses and students who were in the upper level or advanced accounting courses. Researchers contacted accounting instructors by phone and email in order to set up classroom visits. About twenty students expressed their desire to participate. A series of phone and online discussions took place with all participating students over a four-week period. A final list of thirteen students participated in the study or interviews.

Data Collection

For the data collection procedure, we had face-to-face in-depth interviews with the participating accounting students. The interviews were audio recorded and unstructured. The participating students were taking accounting classes in the CBPA when the interviews took place. Each interview lasted for 45 minutes per student. The authors asked the students to sign a consent form before the interviews took place. The authors also addressed the terms of confidentiality with the interviewees, explained to them how to get in touch with the authors, and let them know that the authors intended to share the findings with them.

ANALYSIS

Qualitative Content Analysis (QCA)

QCA is a method of interpreting narrative material and, thus, has been associated with coding and classifying processes used in some types of qualitative research (Bos & Tarnai, 1999). Thematic content analysis is useful in our study because, it is a method of analysis that can accommodate a large amounts of data (Bos & Tarnai, 1999). In the process Ezzy, thematic content analysis refers

to a difficult skill development that comes from rigorous and high quality social science experience (Broom, 2005). The four parts the process Ezzy of qualitative content analysis are: open coding, axial coding, constant comparison, selective coding and revisiting the literature.

This study has used a mix of qualitative and quantitative content analyses. The process Ezzy of content analysis was used to examine data collected from interviews. Our framework (from Figure 1) was compared to factors and categories emerging from the interview data analysis. Following the process Ezzy approach, categories were established. In this way, the text units were associated with their relevant factors inside the Blackboard-Supported Learning and Innovation Category, Blackboard-Supported Internal Process Category, Blackboard-Supported Student Value Proposition Category, and Blackboard-Supported Financial Perspective Category. These categories and factors were represented based on the content found in the transcript of the interviews. Table 1 shows the results of the QCA.

Reliability Test

Concerning the reliability of the study, two judges listened to the tapes and generated the transcripts of the interviews. Additionally, inter-judge reliability was assessed using the Cohen's kappa coefficient, which corrects for bias and is appropriate when there are two judges (McLaughlin, Belon, Smith & Erickson, 2015). Cohen's kappa (k) measures the overall inter-coder reliability, and Cohen's kappa (k) results that are closer to 1 indicate a perfect consensus between both coders, while 0 indicates lower agreement between the pair of judges (McLaughlin et al., 2015). As noted in Table 1, the Cohen's kappa reliabilities for the factors (bad or good) per category ranged from a high of .96 to a low of .88.

Quantitative Content Analysis (Chi-Square Analysis)

Because of the methodology rigor adopted in this research, quantitative content analysis based on chi-square analysis was used to complete the qualitative one.

The Chi-square test analyzes the difference between the actual counts and the expected counts of a phenomenon. Chi-square tests were conducted for all "good" factors and for all "bad" factors. We referred to positive comments as "good" factors and negative comments as "bad" factors. In this research, we converted unstructured interview message frequencies into percentages. Any count of messages collected from the interview of the accounting students fell into only one category. Table 1 also shows the relationships between the categories of our framework and the interview messages. The interview qualitative data have been transformed into quantitative data by counting the negative and positive messages about each category of our framework (Lawson-Body & Willoughby 2009). The Blackboard-supported learning and innovation perspective, the Blackboard-supported internal process perspective, the Blackboard-supported student' value proposition perspective, and the Blackboard-supported financial perspective have been used as categories.

Finally, the sample for a qualitative field study implying the use of chi-square should be at least 10 organizations, subjects, or observations participating in the interview (Connor-Linton, 2003; Lawson-Body & Willoughby, 2009). The results obtained in this study are based on a sample of 13 accounting student interviews. The guidelines established by Connor-Linton (2003) for the utilization of a chi-square statistical test were applied to the total number of accounting students who participated in our interview. This is considered very satisfactory.

FINDINGS

Results of the QCA

After the content analysis and the reliability tests were conducted, all factors, which were found, fell in the Blackboard-supported learning and innovation perspective, the Blackboard-supported internal process perspective, the Blackboard-supported student value proposition perspective, and the Blackboard-supported financial perspective categories. As shown in Table 1, some of the expected

Table 1. Factors per Category

Categories	Codes	Factors	Cohen's Kappa (k)
Blackboard-Supported Learning and Innovation Category	CLBB	Continuous learning on online resources.	.90
	CLNB	Blackboard does not help for continuous learning.	.89
	LFTL	Keeping the exercises key for long term.	.90
	LFNL	Blackboard could change over time and even disappear.	.93
	AKCG	Accounting skills should stay and can easily be updated.	.89
	AKNG	Blackboard does not guarantee frequent change of law and regulations.	.90
	TRAS	Blackboard training is needed.	.95
	TRNS	Training is not the answer because Blackboard is too complex.	.88
	TSCB	Some of us are comfortable with the use of Blackboard.	.88
	TSNB	All students do not have the same technology background.	.94
	TOSG	Blackboard is necessary for accounting tutoring.	.96
	TONG	There is no Blackboard for the tutoring. It is just face-to-face tutoring.	.90
	GPPR	Blackboard shows my grade progression.	.93
	GPNR	My grade progression does not motivate to deploy more effort.	.95
Blackboard-Supported Internal Process Category	ECAT	Blackboard is available anytime and anywhere.	.93
	ECNT	Blackboard does not always allow interaction.	.89
	SDAA	Blackboard is available through my smart phone and many other devices.	.94
	SDNA	I use my smart phone for entertainment.	.91
	SBAS	Exchange of experience about Blackboard when we get together.	.95
	SBNS	Some students who do not participate in accounting club gathering do not benefit from this experience.	.92
	ICLP	Provide interactive assistance to accounting students.	.89
	ICNP	No immediate clarification of assignments on Blackboard.	.91
	ABWG	Working in-group on assignments with Blackboard.	.92
	ABNG	Some accounting exercises are too difficult to do in-group online.	.89
	HATM	I use Blackboard to have synchronized conversations with my teachers.	.95
	HANM	I keep using phone calls and office visits with my instructors.	.90
	EIFG	Blackboard favors cheating and even plagiarism.	.88
	EIFNG	Some instructors randomize the exams' questions on Blackboard or give projects instead of exams.	.91
	SAKA	Blackboard allows students to take self-assessment test or exam.	.93
	SANA	There are no self-assessment tools available on Blackboard.	.95
	KPPK	Self-discipline on Blackboard.	.90
KPNK	Get access to the answer key before doing the practices.	.94	

continued on following page

Table 1. Continued

Categories	Codes	Factors	Cohen's Kappa (k)
Blackboard-Supported Student Value Proposition Category	PTSQ	I do not attend class meetings.	.89
	PTNQ	I need to balance class attendance and the use of Blackboard.	.96
	OHCS	Announcement of accounting open house information.	.91
	OHNS	Lack of open house information on Blackboard.	.90
	MHGR	Instant grading available on Blackboard.	.89
	MHNR	All assignments are not graded automatically.	.90
	CEII	Choose my instructors' availability time online to complete my assignments.	.89
	CENI	My learning schedule is always in conflict with my work schedule.	.95
	IPPA	Recording of guest speakers' presentations adds video capability to accounting education.	.89
	IPNA	Additional materials like cameras and microphones are needed for recording.	.88
	WDCA	Security on Blackboard favors a degree of confidentiality and authentication. This is related to FERPA.	.94
	WDNA	Security used to protect financial data and transactions is not available on Blackboard.	.93
	ASER	Blackboard offers services that attract students.	.93
	ASNR	The nature of accounting topic favors face-to-face more than online classes.	.90
	QULS	The quality of Blackboard can be used to lock-in the students.	.88
QUNS	Students would change their academic program or seek transfer if Blackboard is not available.	.91	
Blackboard-Supported Financial Category	CTST	The use of Blackboard will cut a lot of time.	.93
	CTNT	I spend more time because accounting assignments are based on numbers and methods.	.94
	OTCT	The use of Blackboard allows me to save cost related to transportation, renting and student living.	.90
	OTNT	The analytical component in accounting education makes me more likely to attend class. Hybrid education matters in accounting.	.87
	DCFU	The use of Blackboard may decrease the cost because it would limit the cost of the paperwork.	.92
	DCNU	Some projects could be graded by the graduate teaching assistants or the instructors. So there is cost associated with that.	.95
	GTEA	Using Blackboard to grade and automatically report the grades would decrease the errors.	.93
	GTNA	There would be many errors if the tests, quizzes, exams, and assignments are manually graded.	.92
	SAPK	Announcements on Blackboard regarding scholarships.	.89
	SANK	The use of Blackboard does not guarantee that you will have a scholarship.	.91
	IASN	Announcements on Blackboard regarding internships.	.89
	IANN	The information displayed on Blackboard can be found in the newspapers.	.93

factors were found in all 4 categories. Table 1 also shows each “good” factor (positive message) followed by its associated “bad” factor (negative message).

Hypotheses Tests: Results of the Quantitative Content Analysis

The test of Chi-square for equality of percentages is commonly used to decide whether a table of observed counts or percentages could reasonably have come from a population with known percentages (Siegel, 2012). Chi-square was selected in this research because it is a rough estimate of confidence; it accepts weaker, less accurate data as input more than parametric tests (like t-test, f-fisher, and analysis of variance) (Connor-Linton, 2003). Also, it does not require the sample data to be more or less normally distributed in the population from which the sample is drawn (Connor-Linton, 2003).

Hypothesis Testing (H1): Chi-Squares of Learning and Innovation

Table 2 summarizes the coded observed messages (taken from the second column of Table 1), the number of messages, the percentages, the number of students, and the chi-squares of messages

Table 2. Chi-squares of learning and innovation

Coded Observed Messages	Number of Messages	Percentages (%)	Number of Students	Chi-Squares
CLBB	12	24	5	6.76
CLNB	38	76	8	
Total	50	100	13	
LFTL	10	28	4	3.55
LFNL	26	72	9	
Total	36	100	13	
AKCG	16	29	4	4.80
AKNG	39	71	9	
Total	55	100	13	
The total chi-square value is				15.11*
TRAS	41	82	10	10.24
TRNS	9	18	3	
Total	50	100	13	
TSCB	42	81	9	9.84
TSNB	10	19	4	
Total	52	100	13	
TOSG	18	53	5	0.05
TONG	16	47	8	
Total	34	100	13	
GPPR	46	90	11	16.48
GPNR	5	10	2	
Total	51	100	13	
The total chi-square value is				36.61*

*P<0.001

related to the impact of the Blackboard-supported learning and innovation perspective on accounting students' academic performance.

Table 2 presents the results of chi-square tests carried out to determine whether positive messages about the Blackboard-supported learning and innovation perspective predominate over negative messages about the Blackboard-supported learning and innovation perspective.

Table 2 has been split in two parts due to the weights of negative messages and the weights of positive messages. In the first part of Table 2, which has the total chi-square value of 15.11, the negative messages about the Blackboard-supported learning and innovation perspective predominate over positive messages (15.11 at $p < 0.001$). After comparing the value of the chi-square statistic of 15.11 with the critical values for the chi-square distribution, we found that the hypothesis H1 is significant (15.11 at $p < 0.001$).

As shown in the second part of Table 2, the Blackboard-Supported Learning and Innovation will have a positive effect on accounting students' performance (36.61 at $p < 0.001$) in the time accounting students are taking accounting classes in the CBPA and in the accounting academic department. That means the Blackboard-supported learning and innovation perspective has a positive impact on accounting students' performance at the earlier stage of the accounting students' career. However, as students advance in their career, that hypothesis was found to be negative because accounting students will keep taking accounting courses after their graduation and this will last throughout their career in order to keep their CPA active and to meet the American Institute of Certified Public Accountants (AICPA) requirements.

Hypothesis Testing (H2): Chi-Squares of Internal Process Perspective

Table 3 summarizes the coded observed messages, the number of messages, the percentages, the number of students, and the chi-squares of messages related to the impact of the Blackboard-supported internal process perspective on accounting students' academic performance.

Table 3 presents the results of chi-square tests carried out to determine whether positive messages about the Blackboard-supported internal process perspective predominate over negative messages. The results show that positive messages were significantly greater than negative messages (49.36 at $p < 0.001$). Thus, hypothesis 2 is accepted.

Hypothesis Testing (H3): Chi-Squares of Student Value Proposition Perspective

Table 4 summarizes the coded observed messages, the number of messages, the percentages, the number of students, and the chi-squares of messages related to the impact of the Blackboard-supported student value proposition on accounting students' academic performance.

Table 4 presents the results of chi-square tests carried out to determine whether positive messages about the Blackboard-supported student' value proposition perspective predominate over negative messages. The results show that positive messages were significantly greater than negative messages (39.59 at $p < 0.001$). Thus, hypothesis 3 is significant.

Hypothesis Testing (H4): Chi-Square of Financial Perspective

Table 5 summarizes the coded observed messages, the number of messages, the percentages, the number of students, and the chi-squares of messages related to the impact of the Blackboard-supported financial perspective on accounting students' performance.

Table 5 presents the results of chi-square tests carried out to determine whether positive messages about the Blackboard-supported financial perspective predominate over negative messages. The results show that positive messages were significantly greater than negative messages (38.98 at $p < 0.001$). Thus, hypothesis 4 is significant.

Table 3. Chi-squares of internal process perspective

Coded Observed Messages	Number of Messages	Percentages (%)	Number of Students	Chi-Squares
ECAT	28	82	9	7.11
ECNT	6	18	4	
Total	34	100	13	
SDAA	33	77	8	6.15
SDNA	10	23	5	
Total	43	100	13	
SBAS	31	84	10	8.44
SBNS	6	16	3	
Total	37	100	13	
ICLP	24	73	9	3.40
ICNP	9	27	4	
Total	33	100	13	
ABWG	36	77	8	6.64
ABNG	11	23	5	
Total	47	100	13	
HATM	29	76	10	5.26
HANM	9	24	3	
Total	38	100	13	
EIFG	28	55	7	0.24
EIFNG	23	45	6	
Total	51	100	13	
SAKA	32	76	8	5.76
SANA	10	24	5	
Total	42	100	13	
KPPK	30	79	9	6.36
KPNK	8	21	4	
Total	38	100	13	
The total chi-square value for Table 3 is				49.36*

*P<0.001

DISCUSSION

The results show that the four interrelated BSC indicators can be used to measure the accounting students' academic performance when Blackboard is utilized to teach accounting courses. The results also show that three of the four Blackboard-supported BSC perspectives (internal process, student value proposition, and financial) have a positive impact on accounting students' academic performance. However, the impact of the fourth Blackboard-supported learning and innovation perspective on

Table 4. Chi-squares of student value proposition perspective

Coded Observed Messages	Number of Messages	Percentages (%)	Number of Students	Chi-Squares
PTSQ	31	69	9	3.21
PTNQ	14	31	4	
Total	45	100	13	
OHCS	43	80	11	9.48
OHNS	11	20	2	
Total	54	100	13	
MHGR	32	55	6	0.31
MHNR	26	45	7	
Total	58	100	13	
CEII	35	76	10	6.26
CENI	11	24	3	
Total	46	100	13	
IPPA	42	84	8	11.56
IPNA	8	16	5	
Total	50	100	13	
WDCA	29	67	9	2.61
WDNA	14	33	4	
Total	43	100	13	
ASER	19	73	10	2.76
ASNR	7	27	3	
Total	26	100	13	
QULS	24	73	9	3.40
QUNS	9	27	4	
Total	33	100	13	
The total chi-square value for Table 4 is				39.59*

*P<0.001

accounting students' academic performance is different because an accounting career is a continuous learning endeavor. The changing and evolving nature of the Blackboard technology could not fit to the evolution of accounting principles, regulations, and laws.

Impact of Blackboard-Supported Learning and Innovation on Accounting Students' Performance

We found that, over time or after their graduation, the use of Blackboard to improve accounting students' learning strategy decreases because Blackboard is a technology that could not follow the progression and update of accounting knowledge. This confirms that the perception of accounting students using Blackboard for learning and innovation varies profoundly. This finding corroborates with the result of the study of Ozpeynirci et al. (2015) who found that there is no continuous learning opportunity for the students as they progress through their career when they applied the learning

Table 5. Chi-square of financial perspective

Coded Observed Messages	Number of Messages	Percentages (%)	Number of Students	Chi-Squares
CTST	42	78	9	8.33
CTNT	12	22	4	
Total	54	100	13	
OTCT	30	73	8	4.40
OTNT	11	27	5	
Total	41	100	13	
DCFU	38	75	9	6.12
DCNU	13	25	4	
Total	51	100	13	
GTEA	36	82	10	8.90
GTNA	8	18	3	
Total	44	100	13	
SAPK	28	70	8	3.2
SANK	12	30	5	
Total	40	100	13	
IASN	43	77	9	8.03
IANN	13	23	4	
Total	56	100	13	
The total chi-square value for Table 5 is				38.98*

*P<0.001

and innovation perspective of the BSC. This part of our results also finds support from Keller et al. (2009) who found that the method of class delivery, whether online or face-to-face, does not affect accounting students' academic performance.

Impact of Blackboard-Supported Internal Process Perspective on Accounting Students' Performance

We found that accounting students adopted the potentiality of the use of the Blackboard-supported internal process perspective. They also believed that potentiality increases their academic performance. There is clearly a strong link between our findings and the previous findings of Lin et al (2014) because these authors found that the main benefit of the interactions between accounting students and Blackboard is high learning performance. They outlined that Blackboard can make available accounting curriculum for accounting students allowing them to make better decisions about their course management. Impact of Blackboard-Supported Student Value Proposition on Accounting Students' Performance.

We found that the Blackboard-supported student value proposition impacts accounting students' performance.

These findings corroborate with the results found in the study of Ozpeynirci et al. (2015) that the customer perspective of BSC allows the university to determine which courses increase the level of knowledge of the students. However, these findings contradict that of Lawrence & Sharma (2002) who found that there is no private good in education, therefore students cannot be treated as customers.

Impact of Blackboard-Supported Financial Perspective on Accounting Students' Performance

Our results show that the Blackboard-supported financial perspective has an impact on accounting students' performance. These results are aligned with Wu et al. (2011), who found that the financial perspective of BSC plays important roles in the performance evaluation of extension education centers. This positive result found more support in the literature from Ozturan & Kutlu (2010) and Navimipour & Zareie (2015), who found that reduction in travel expenses for students is another benefit for the use of Blackboard to deliver accounting courses. However, our findings differ from that of the authors above because of the specificity of our study, which deals with the performance of accounting students. In our case the university is not looking for profit to pay dividend to stakeholders. The university must minimize cost in order to spend properly taxpayer resources.

CONCLUSION

The objective of this study is to conduct qualitative research to understand the use of BSC in measuring accounting students' performance when Blackboard is utilized to deliver courses. This objective sheds lights on some important research insights. To analyze these insights, a literature review was conducted in order to explain the use of Blackboard or other e-learning systems in higher education and specifically in accounting education. The literature review also covers the application of the theory of BSC in education and demonstrates that in its original form, the BSC was designed to be a performance measurement tool, using four interrelated business perspectives: financial, customer, internal business process, and innovation and learning.

Following the literature review and the theoretical background of our study, a research model or framework was designed to show the relationships between the four interrelated BSC perspectives and the use of Blackboard in accounting education. In the research model accounting students' performance was measured by the Blackboard-supported innovation and learning perspective, Blackboard-supported internal process perspective, Blackboard-supported student value proposition perspective, and Blackboard-supported financial perspective. Four hypotheses were used to materialize the relationships in the research model.

QCA was used to process interview data that were collected from 13 accounting students of a CBPA in the US. The accounting academic department of the selected CBPA uses Blackboard intensively to teach and permit learning for accounting students. The use of an interview guide or schedule enabled us to conduct the unstructured interviews that were audio recorded. The interview lasted for about 45 minutes. This research design was approved by the IRB because it involved accounting students and their instructors. The demographics profile of the students interviewed shows that all participants were majoring in accounting and had used Blackboard for more than a year to receive accounting knowledge.

Content analysis was used to analyze the materials by reading them and looking for themes and patterns. Categories spontaneously emerged from the interview data and were then compared to the relationships in the conceptual framework. All factors found fell in the Blackboard-supported learning and innovation perspective, the Blackboard-supported internal process perspective, the Blackboard-supported student value proposition perspective, and the Blackboard-supported financial perspective categories.

Future research is necessary because Blackboard technology evolves so rapidly and its evolution may likely affect in different ways the relationship between academic performance and e-learning. This study focuses on only accounting students and concerns those students may have when they take online courses or use Blackboard in face-to-face courses. Future research is needed in order to apply the results to other students because concerns or issues such as cheating, attending class, someone else doing students' academic work go across the entire academic field.

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