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As education continues to evolve and increase in complexity, the case for understanding the customer becomes greater. In addition, the need to create strategic relationships and improve internal operations becomes paramount. This issue highlights methods to capture the voice of the customer, understand leadership roles, create collaborative initiatives, and improve processes within and across education.

This issue is comprised of five articles that illustrate the necessity of continuing to drive quality and continuous improvement throughout all aspects of education. The first article, by Godson Tetteh, addresses the application of the Kano model to understand the voice of the customer (student) and other stakeholders in higher education while also resolving conflicts between the major stakeholders. The research uses a novel approach to incorporate the perspectives from each of the major stakeholder groups including academic leaders, administrators, teachers, and students. The next article by Raghu Tadepalli and Ravi Chinta employs directed learning through the use of templates that guide the development of strategic options. The research assesses the impact on learning outcomes in strategy-options development projects as part of an MBA program. The third article by Sandra Furterer, Kellie Schneider, Michael Key, and Yusheng Zhang applies Lean Six Sigma to improve the utilization of tutors and create a more efficient and effective tutoring center at a university. The case study follows the Define-Measure-Analyze-Improve-Control methodology and provides a framework for conducting similar projects in other areas of education. The next article by Louis Hickman and Mesut Akdere addresses the cross-departmental impact of information technology leadership on quality initiatives. As continuous improvement projects are implemented, information technology leadership is in a unique position to provide cross-departmental vision to design the most appropriate solutions across a higher education institution. The final article by Casey Abington introduces an innovative approach to collaboration in higher education for low-enrollment majors, particularly as state budgets are shrinking. By developing a collaborative approach to teaching economics courses across three universities, students are able to access additional faculty and have added opportunities for networking while the universities operate more efficiently.

These five articles illustrate the breadth of quality in education – from gathering and analyzing the voice of the customers to improving learning in the classroom and class projects to innovative collaborative approaches. Quality tools can be used strategically throughout all facets of education from the classroom to campus-wide initiatives.

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Education Division’s Advancing the STEM Agenda Book

A collection of conference papers from the 2011 Advancing the STEM Agenda Conference. Available through ASQ Quality Press.

This publication is full of collaborative models, best practices, and advice for teachers, higher education faculty, and human resources personnel on improving the student retention (and thereby increasing the supply of STEM workers). Ideas that will work for both STEM and non-STEM fields are presented. The introduction maps out the current landscape of STEM education and compares the United States to other countries. The last chapter is the conference chairs’ summary of what was learned from the conference and working with 36 authors to develop this book. This effort is part of a grassroots effort among educators to help more students be successful in STEM majors and careers.

“Veenstra, Padró, and Furst-Bowe provide a huge contribution to the field of STEM education. We all know the statistics and of the huge need in the area of STEM students and education, but what has been missing are application and success stories backed by research and modeling. The editors have successfully contributed to our need by focusing on collaborative models, building the K-12 pipeline, showing what works at the collegiate level, connecting across gender issues, and illustrating workforce and innovative ideas.”

John J. Jasinski, Ph.D.
President, Northwest Missouri State University

“Advancing the STEM Agenda provides a broad set of current perspectives that will contribute in many ways to advancing the understanding and enhancement of education in science, education, and engineering. This work is packed with insights from experienced educators from K-12, regional, and research university perspectives and bridges the transition from education to workplace.”

John Dew, Ed.D.
Senior Vice Chancellor, Troy University
Resolving Stakeholder Challenges in the Higher Education System

Godson A. Tetteh

Abstract

The purpose of this article is to study how to resolve conflicts among major stakeholders using the Kano model so as to improve the quality of higher education. The research presented in this article was part of an action research study. The empirical material was collected by various methods (face-to-face interviews and an electronic survey) in private and public higher education institutions in Accra, Ghana. The respondents included academic leaders, administrators, teachers, and students. The study shows that incorporating a view of major stakeholder expectations in a Kano model could help resolve conflicts and prioritize stakeholder needs. The outcome could help higher education administrators improve existing planning processes, resolve needs and critical-to-quality characteristics of other major stakeholders, and provide some social benefits. This article expounds on applying the Kano model based on major stakeholder expectations in the higher education system to achieve quality. While a number of papers have been published on the applications of the Kano model, none have used the model to resolve conflicts among the major stakeholders in the higher education system. This approach appears to overcome a gap that was identified in earlier research.

Keywords

Higher Education Quality, Kano Model, Stakeholder Expectations, Stakeholder Conflict Resolution

Introduction

The concept of this research began when the author conducted an exit interview with a former rector of a higher education institution (HEI) regarding some management challenges during his tenure. The rector is the chief executive officer of an HEI and a member of the council of governors. The exit interview focused on the belief that HEI stakeholders held diverse needs or expectations on quality higher education (Pham and Starkey, 2016). Scholars have disagreed about the definition of quality in terms of the HEIs (Sunder, 2016; UNESCO, 2014). In addition, higher education administrators (HEAs) face a daunting task with persistent demands for rigorous academic quality standards and the necessity of meeting all the needs or expectations of the major stakeholders. Stakeholder (or customer) satisfaction from the conceptual framework in quality management is the leading criterion for determining the quality of the product/service offered (Ganguli and Roy, 2011; Pizam, Shapoval, and Ellis, 2016; Vavra, 1997, 2002). Thus, the HEA is accountable to the major stakeholders to achieve quality.

Previous research shows that as the number of stakeholders increases, there is a likelihood of disagreement on the definition of quality of education as well as miscommunication of expectations and priorities (Kreps, 1990; Finch, 1994; Hatami, Rangraz, and Jahromi, 2016). An effective HEA must build consensus with the major stakeholders to improve the quality of higher education (HE). Nevertheless, difficulties in changing the organizational culture and the absence of tools create substantial obstacles in improving the quality of HE (Luxford, Safran, and Delbanco, 2011). To overcome these difficulties, one needs a tool
that supports an understanding of the major stakeholder needs and expectations (Mazur, 2003).

The exit interview with the former rector revealed that HEAs experience challenges in the process of transforming their institutions, with opposing forces and major stakeholders having competing interests (Mabokela, 2002). What are the needs and preferences of the major stakeholders within the HEIs? What tools are available to address these stakeholder needs and preferences? What are the challenges in implementing some of these tools? This study uses an action research approach to answer these questions.

Literature Review

In order to conduct a comprehensive literature review and understand the challenges, HE stakeholders must be identified. Freeman (1984) defined a stakeholder as “any group or individual who can affect or is affected by the achievement of an institution’s purpose.” From this definition a stakeholder can be a single person or a group, who can influence, or is influenced by, the achievement of the institutions’ goals and objectives. Kumar, Rahman, and Kazmi (2016) suggested an approach to identify and classify stakeholders in order to recognize the major stakeholders who affect or are affected during the achievement of organizational objectives. Kumar et al. (2016) proposed four categories or classes of stakeholders: economic, social, environmental, and regulatory. For an organization, Friedman and Miles (2006) proposed the major stakeholders as customers, employees, local communities, suppliers and distributors, shareholders, media, the public in general, future generations, past generations, academics, competitors, non-governmental organizations, activists, trade unions or trade associations, financiers, government, regulators, and policymakers. According to Asiyai (2015), the major stakeholders in HE are made up of internal stakeholders such as the HE governing council, HEAs, students, teachers, and other staff members. External stakeholders include non-governmental organizations, community-based organizations, government oversight commissions, parents, employers of labor, trade unions, the alumni association, industries/firms, HE competitors, development agencies both local and international, and society as a whole. The expectations by the various HE stakeholders are provided in detail next.

HE Governing Council

National governments that own public HEIs are represented by a governing council. This council performs numerous roles including defining strategic vision, policy formulation, and monitoring to ensure continuous improvement in the quality of HE (Asiyai, 2015). The governing council in private HEIs performs a similar role. Usman (2014) posits that an effective policy-making decision requires an enlightened governing council that has a broad view of the impact of HE on society and is cognizant of the strategic direction in terms of quality.

The fundamental purpose of HE policymakers and their expectations is to develop the knowledge and skills that students need for professional, technical, and managerial positions. Brint and Clofter (2016) posit that HE has expanded from an elite to a mass system, and policymakers have taken an interest as well in whether HE opportunities are fairly distributed and accessible to all. Notwithstanding, Goldin and Katz (2008) argued that HE accessibility is an important measure of social mobility to bring greater equality to society. Policymakers have also focused on the volume and quality of HE’s production of basic and applied researchers, who will become the next generation of scholars and scientists (Cole, 2009).

Finally, policymakers would want to expand HE to ensure that human capital development can meet the changing occupational needs of an increasingly knowledge-based society. Thus, Brint and Clofter (2016) suggest the following questions for assessing the quality of HE to meet stakeholders’ expectations: Are students being prepared adequately for the labor market? Is the system accessible to students from all backgrounds? How large are the gaps in success between students from different backgrounds? Is research productivity high and is it contributing to human well-being? Are HEIs producing well-prepared graduate students? Are the new business methods contributing to greater quality and effectiveness in the allocation of resources? Has the emphasis on interdisciplinary collaboration led to a greater capacity to tackle key national problems? How much are students learning? To what extent are the new instructional practices and technologies contributing to student learning?

Higher Education Administrator (HEA)

Most HEAs focus on global ranking and accreditation institutions to determine the quality of HE. According to Sunder (2016), the expectations of HEAs include increases in enrollment, global ranking, number of research papers published per department, quality of research, HEI maintenance and infrastructure metrics, standard of teaching, reduction in students’ absenteeism, and effectiveness of accreditation process, among others.

Students

HEIs’ vision and mission statements focus on the students in order to provide quality education and create an enabling environment for students to succeed. Several studies have defined students as the primary customers in HEIs (Gruber, Reppel,
are quickly imitated by other providers, leaving administrators of the degree programs of the distance education market via the internet (Emiliani, 2016). Razavi, Safari, and Shafie (2012) posit that customer or student's perceptions can be used to determine appropriate approaches to assure quality, since various stakeholders think about quality in different ways (Elassy, 2015; Udam and Heidmets, 2013). This has led to conflicts among stakeholders (Pham and Starkey, 2016). Razavi, Safari, and Shafie (2012) posit that customer or stakeholder satisfaction is the ultimate goal to achieve quality HE. Hence, stakeholder needs and expectations must be met to achieve quality HE.

HEAs confront an ever-declining student population and an oversupply of capable HE service providers, including growth of the distance education market via the internet (Emiliani, Kensington, and Most, 2005). Most of the degree programs are quickly imitated by other providers, leaving administrators to compete on the basis of price. Thus, HEAs must focus on increasing enrollments and global ranking, among others for success (Sunder, 2016). Notwithstanding, boosting enrollment could translate into increasing the number of students who have difficulty coping with their studies. A U.S. National Governors Association (1986) study suggests that international competition and the increasing number of students entering HE with lower levels of academic preparation heightened worries about the quality of HE. HEAs, by increasing enrollment, may cause an increase in class size, which conflicts with the teacher's or student's definition of quality. HE teachers may prefer a smaller student-to-teacher ratio in terms of quality.

Marginson and Van der Wende (2007) criticized HEAs for focusing on global rankings to achieve quality. They argued that global rankings by Shanghai Jiao Tong University and the Times Higher Education (2015) neither provide guidance on the quality of teaching nor recommend a “clean” ranking, which is transparent, free of self-interest, and methodologically coherent, to improve the quality of HE (Marginson and Van der Wende, 2007).

HEAs have also been criticized for developing good specialist professionals, yet unable to produce well-rounded graduates and, in particular, those who understand business-process orientation and cross-functional integration (Kavanagh and Drennan, 2008). HE teachers are promoted based on their research, teaching, and service to the community. Employers may need to retrain the less well-rounded and trained graduates at a higher cost (Green, 1994). The nature of HE instruction will need to become not only more varied and versatile, but will also have to be very high quality to exceed stakeholder expectations.

Research suggests that despite the calls for accountability and reform in HE, there is insufficient stakeholder dialogue and consensus (Bogue and Hall, 2012; Morse, 2014; Zemsky, 2009). Although stakeholders agree that HE is in need of reform, there is insufficient knowledge about the extent to which major stakeholders align or differ on various characteristics of accountability (Bogue and Hall, 2012). From these perspectives, the needs and expectations of the major stakeholders (HE governing council, HEAs, students, and teachers) should create the needed environment for institutional change and improvement (Hess and Benjamin, 2015).

Brint and Clofter (2016) suggested that most studies are principally interested in how HEIs work and what forces in their environments lead them to change. However, most policymakers do not want to simply understand HEI systems, but rather to know how to make them work better to achieve quality HE. An HE must focus on the needs or expectations of its stakeholders to achieve quality HE. Consequently, the goals, objectives, and focus of some of the major stakeholders in HEIs

Conflicts in HE Stakeholder Needs or Expectations

Kotler (2012) posits that quality science, just like marketing science, establishes the need to clearly define and understand the needs of the customer or stakeholder as a prerequisite for any management philosophy. A variety of literature has been published on the definition of quality HE: as a philosophical concept and elusive (Elassy, 2015); as fitness for purpose (Woodhouse, 2006); as a transformation and adding of value to the stakeholder (Chong, 2014); as a context-relative term such as teaching and learning (Elassy, 2015); and as a stakeholder-relative concept including students, academics, employers, non-academic staff, government, funding agencies, creditors, and assessors (Burrows and Harvey, 1992). It has been argued that understanding customers’ perceptions can be used to determine appropriate approaches to assure quality, since various stakeholders think about quality in different ways (Elassy, 2015; Udam and Heidmets, 2013). This has led to conflicts among stakeholders (Pham and Starkey, 2016). Razavi, Safari, and Shafie (2012) posit that customer or stakeholder satisfaction is the ultimate goal to achieve quality HE. Hence, stakeholder needs and expectations must be met to achieve quality HE.
that are conflicting must be resolved. The aim of this study is to identify a tool to resolve some of these conflicts within stakeholder expectations. To achieve this aim, the question “To what extent do HEAs meet the major stakeholders’ expectations?” was investigated.

**Tools Available for Managing Stakeholder Conflicts and Challenges in Implementation**

In this competitive HE environment, the survival of the institution depends on the ability to meet and exceed stakeholder expectations. Hence, the HEA must identify new tools, technologies, and systems to improve the quality of HE by translating the voice of the customer (stakeholder expectation) into critical to quality (CTQ) characteristics.

Studies have found that HE stakeholders hold diverse perspectives on quality and are reluctant to use the results of accreditation evaluation reports because of conflicts of interest (Fenwick, 2016; Pham and Starkey, 2016; Miller, 2016). Challenges in implementing the quality initiatives to resolve some of these conflicts include resistance to change by administrators, teachers, and staff members; lack of time; short-term thinking; stuck on tradition; what is in it for me? mentality; and lack of support from team members (Akao, 1990; Aly and Akpovi, 2001). According to Vazzana, Backmann, and Elfink (1997), quality initiatives are widely practiced in HEIs, for example, there are several criteria required for HEIs to fulfill for the Malcolm Baldridge National Quality Award. Though, Karapetrovic, Rajamani, and Willborn (1999) indicated that without a methodical approach to improving quality, the initiatives to improve HE may be doomed for failure. Venkattraman (2007) posits that in HEIs, service quality focuses on the students, time of delivery of programs, intangibility (for example, the learning process being challenging to measure), and difficulty in measuring successful output and productivity in quality. However, Hwarng and Teo (2001) state that a critical step in implementing quality in HE is to identify current and potential stakeholders. Thus, stakeholders’ focus must provide direction for HE quality improvement initiatives.

Other studies measuring the quality of HE have used the SERVQUAL method (Parasuraman, Zeithaml, and Berry, 1985; Tuan, 2012), Higher Education Performance (HEdPERF) (Abdullah, 2006), and Higher Education Service Quality (HiEdQual) (Annamdevula and Bellamkonda, 2012) models. Notwithstanding, a long-term Harvard study found that institutions which blindly fulfill stakeholders’ expectations did worse than institutions which balanced the interests of all their stakeholders (Caulkin and Black, 1994; Kotter and Heskett, 1992). Nonetheless, Abidin (2015) argued that the differences in SERVQUAL, HEdPERF, and HiEdQual models show that service quality varies, depending on the research objective and the stakeholder group and, therefore, are unsuitable for the purpose in this study. Hence, the tool must help the HEA improve the existing processes by balancing the interests of all stakeholders to ensure maximum results in quality HE.

Quality function deployment (QFD) (Akao, 1997) and the Kano model (Kano, Seraku, Takahashi, and Tsuji, 1984) are tools used extensively to identify and translate the voice of customer, CTQ, or stakeholder expectations to improve quality (Al-Bashir, 2016; Tetteh, 2015). Previous research acknowledges the risk of the HEA solely relying on his/her expectations to achieve quality HE (Keller et al., 2014). Although QFD (Yeh, 2010) and SERVQUAL (Sulisworo and Maniquiz, 2012) methodologies have been used to improve quality, the Kano model has been shown to be more beneficial (Paraschivescu and Cotirlet, 2012; Sulisworo and Maniquiz, 2012). Also, Lo, Shen, and Chen (2016) state that it is a challenge for traditional QFD to accurately recognize customer expectations. The Kano model, and its related theory and methodology, is well-established and has been applied extensively in the field of education (Tetteh, 2015; Witell, Löfgren, and Dahlgaard, 2013). Kano, Seraku, Takahashi, and Tsuji (1984) stated that blindly fulfilling stakeholder expectations has risk associated with it, if the product or service provider is not aware that there are different types of stakeholder requirements. Lately, research has been published on practical applications of the Kano model in translating the voice of customer to improve quality (Mitrasbus, 2013; Paraschivescu and Cotirlet, 2012; Sulisworo and Maniquiz, 2012). While a number of papers have been published on the applications of the Kano model, relatively few have used the model to resolve conflicts among major stakeholders in the HE system (see Chang and Chang, 2012; Gustavsson, Gremyr, and Sarenmalm, 2016; Keller et al., 2014; Shahin et al., 2017). The Kano model is useful for incorporating stakeholder expectations into the design of processes (Mikulic and Prebezac, 2011). As also concluded by Walden (1993), the Kano model analysis has the potential to increase confidence in the analysis of stakeholder expectations. Thus, by choosing the Kano model from the review, this research will overcome the gap in terms of focusing on a sole stakeholder and blindly fulfilling stakeholder expectations.

**Method: Kano Model**

The Kano model is employed to identify the stakeholder expectations that are CTQs and the functional requirements (FR) to help improve the quality of HE. To that end, Sunder (2016) proposed CTQ stakeholder expectations to generate what the stakeholder needs or expects. The traditional Kano model is an approximate estimate of the stakeholders’ expectations, which
only allows attributes of qualitative assessment of the expectations (Wasenaar, Chen, Cheng, and Sudjianto, 2005). This research employed several quantitative measures to assign scales in terms of the levels of stakeholder satisfaction or dissatisfaction (Berger et al., 1993; Matzler and Hinterhuber, 1998).

Based on the Kano model, the FR of each variable were initially classified using the functional and dysfunctional form of the Kano model questions (Kano et al., 1984) as Exciter or Attractive (A), Must-be (M), One-dimensional (O), and Indifferent (I) as depicted in Table 1.

Table 1: Kano Evaluation Table (Kano et al., 1984)

<table>
<thead>
<tr>
<th>Functional Question</th>
<th>Dysfunctional Questions</th>
</tr>
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<tbody>
<tr>
<td>I like it that way</td>
<td>I like it that way</td>
</tr>
<tr>
<td>It must be that way</td>
<td>It must be that way</td>
</tr>
<tr>
<td>I am neutral</td>
<td>I am neutral</td>
</tr>
<tr>
<td>I can live with it that way</td>
<td>I can live with it that way</td>
</tr>
<tr>
<td>I dislike it that way</td>
<td>I dislike it that way</td>
</tr>
</tbody>
</table>

E: Exciter or Attractive, O: One-dimensional, M: Must be, I: Indifferent, R: Reverse, Q: Questionable

For each variable, contingency output was generated (between functional and dysfunctional questions) and the frequencies of respondents were summed according to the classification structure (where the letters represent the stakeholder groups). A functional question captures the stakeholders’ response if an expectation has a certain attribute, and a dysfunctional form question captures the response if an expectation does not have that attribute. A Questionable (Q) category is not included in the averages, and a Reverse (R) category can be transformed out of the category by reversing the sense of functional and dysfunctional questions (Berger et al., 1993). To fully exploit these insights, all the needs and the expectations of the major stakeholders must be analyzed and ranked as Dissatisfier – Must be; Satisfier – More is better; and Exciter – Latent need by using the Kano model (Tetteh, 2015).

Following the research of Xu, Jiao, Yang, and Helander (2009), this study adopts a scoring scheme that defines stakeholders’ satisfaction (using functional questions) and dissatisfaction (using dysfunctional questions) as depicted in Table 2. The scale is designed to be asymmetric because positive answers are considered to be stronger responses than negative ones (Tetteh, 2015; Xu, Jiao, Yang, and Helander, 2009).

Table 2: Scores for Functional/Dysfunctional Features (Xu et al., 2009).

<table>
<thead>
<tr>
<th></th>
<th>Functional form questions</th>
<th>Dysfunctional form questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>I like it that way</td>
<td>1.00</td>
<td>−0.50</td>
</tr>
<tr>
<td>It must be that way</td>
<td>0.50</td>
<td>−0.25</td>
</tr>
<tr>
<td>I am neutral</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>I can live with it that way</td>
<td>−0.25</td>
<td>0.50</td>
</tr>
<tr>
<td>I dislike it that way</td>
<td>−0.50</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Participants

This study settled on a cross-sectional survey design to examine the expectations of the major stakeholders (academic leaders, HEAs, teachers, and students) to achieve quality HE leading to the formation of the four groups (Creswell, 2012). This categorization was done through a brainstorming session with the academic leaders and administrators, as in the Emery and Tian (2002) study. To reduce coverage and sampling error, a list of the target population (sometimes called the sampling frame), was obtained from five HEIs (public and private) in Accra, Ghana, and they were randomly selected to become participants (Salant and Dillman, 1994). HEAs participated in this study, as their positions make them rich sources of information on how quality of HE was perceived. This aimed at ensuring “the maximum variation sampling” (Patton, 2002; Pham and Starkey, 2016). Two hundred participants were randomly selected after a passive consent procedure was employed. None of the participants were pressured to participate, and all were assured that it was a voluntary activity. The major stakeholders were represented by 20 (10%) academic leaders, 38 (19%) HEAs, 37 (19%) teachers, and 105 (53%) students. Of the 200 participants, 106 (53%) were males and 94 (47%) were females.

The author acted as an action researcher, conducting research within the Ghanaian HEIs (Coghlan and Brannick, 2008). Two sources were used for data collection. The first was an email from which 113 responses were used. The second source was face-to-face interviews, which lasted about 45 minutes, that were recorded and transcribed. The use of multiple data sources could
be considered triangulation, which serves to strengthen the findings (Bryman and Bell, 2007). A reflective dialogue between the researcher and the stakeholders was used to sort the expectations, which increased the understanding, credibility, and internal validity of stakeholder expectations (Eisenhardt, 1989).

The data for this research were collected through participative observations and interviews with the major stakeholders. An overlap between data collection and data analysis allowed the researchers to iteratively collect and analyze data (Coghlan and Brannick, 2008; Meredith, 1998). A qualitative content analysis (Flick, 2014) was carried out focusing on practical implications of the Kano model and the relation to different stakeholder expectations to improve the quality of HE. Thus, the data were related to the theoretical framework through a second-order analysis of the empirical material (Gustavsson et al., 2016; Reason and Bradbury, 2009; Tetteh, 2015).

**Instrument.** The Sunder (2016) and Kano et al. (1984) questionnaires were slightly modified to fit the present study and measure the major stakeholder expectations as depicted in Table 3.

For each question, respondents could answer in five different ways following a 5-point Likert scale (Likert, 1932): (1) I like it

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**Table 3: Questionnaire (Sunder, 2016)**

<table>
<thead>
<tr>
<th>Stakeholder Expectations (“What”)</th>
<th>Importance 9-point Likert scale</th>
<th>Choose either (1), (2), (3), (4), or (5) only</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 = Never important</td>
<td>I like it that way</td>
</tr>
<tr>
<td></td>
<td>2 = Not very important</td>
<td>It must be that way</td>
</tr>
<tr>
<td></td>
<td>3 = Occasionally important</td>
<td>I am neutral</td>
</tr>
<tr>
<td></td>
<td>4 = Sometimes important</td>
<td>I can live with it that way</td>
</tr>
<tr>
<td></td>
<td>5 = Fairly important</td>
<td>I dislike it that way</td>
</tr>
<tr>
<td></td>
<td>6 = Quite often important</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7 = Very often important</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8 = Continually important</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9 = Always important</td>
<td></td>
</tr>
</tbody>
</table>

1a. Pass percentage of students in a class
2a. Turnaround time for issuing books in the library
3a. Turnaround time for admission process
4a. Overall student satisfaction score
5a. Computer laboratory equipment availability
6a. Computer systems downtime at the university
7a. Number of students placed at corporate jobs
8a. Salary range of passed students from the university
9a. Residential facilities at hostel rooms
10a. Facilities for gymnasium and sports center
11a. Increase in students’ enrollment
12a. Improvement in university ranking
13a. Increase in research papers published per department
14a. Quality of research
15a. University maintenance culture
16a. Food wastage in university cafeteria
17a. Standard of teaching
18a. Student’s absenteeism
19a. Accuracy of medical prescriptions at university’s clinic
20a. Paper consumption in the university
21a. Accreditation process
22a. Accreditation would ensure quality
that way, (2) It must be that way, (3) I am neutral, (4) I can live with it that way, and (5) I dislike it that way. The categorization was done through a brainstorming session with the academic leaders and administrators, as in the Emery and Tian (2002) study. The attributes were then placed in the Kano model based on their influence on stakeholder satisfaction.

Study design relevance – Reliability and validity of outcome measures. The reliability of a scale indicates how the design is free from random error. The aspect of reliability assesses the internal consistency of major stakeholder expectations. A total of 88 items were selected to identify these expectations. In determining the reliability of the instrument, a general rule is that the indicator should have a Cronbach’s alpha of 0.60 or more (Nunnally, 1978). The Cronbach’s alpha for the 88 items was 0.891 as depicted in Table 4, indicating that the instrument was reliable and suitable for analysis.

Based on the findings of Tetteh (2015), the level of importance of the functional requirements was determined by the application of factor analysis (principal component technique). The use of the factor analysis method demands the existence of correlation among the variables of interest and also the adequacy of the sample in order for the factors formed to account for higher deviations in the variables. To achieve construct validity, the data were examined using principal component analysis as the extraction technique and the varimax as the method of rotation. With a cutoff loading of 0.50 and an Eigen value greater than 1.0, none of the items were dropped. The assumption of using the factor analysis method conformed to McNaught, Caputi, Oades, and Deane’s (2007) test of the validity of the Recovery Assessment Scale (RAS).

The high statistics of Bartlett’s Test of Sphericity (18679.340) with the corresponding small significant value (0.0005) confirmed the existence of strong correlation among the responses and the Kaiser-Meyer-Olkin (KMO) statistics of 0.967, which is greater than 0.500 and indicated strong sampling adequacy. Hence, the reliability of the data (sample) for the factor analysis technique is adequate as depicted in Table 5.

Results

The focus of this study was to resolve the conflicts with the expectations of the major stakeholders in the HEIs using the Kano model. The Kano indices were computed to obtain the configuration index for each of the major stakeholder expectations as Exciter or Attractive, Must-be, One-dimensional, or

### Table 4: Reliability Statistics

<table>
<thead>
<tr>
<th>Reliability Statistics</th>
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<tbody>
<tr>
<td>Cronbach’s Alpha</td>
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<tr>
<td>0.891</td>
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### Summary Item Statistics

<table>
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<tr>
<th>Summary Item Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
</tr>
<tr>
<td>Item means</td>
</tr>
<tr>
<td>Item variances</td>
</tr>
<tr>
<td>Inter-item correlations</td>
</tr>
</tbody>
</table>

### ANOVA

<table>
<thead>
<tr>
<th>ANOVA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sum of squares</td>
</tr>
<tr>
<td>Between people</td>
</tr>
<tr>
<td>Within people</td>
</tr>
<tr>
<td>Residual</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

### Hotelling’s T-Squared Test

<table>
<thead>
<tr>
<th>Hotelling’s T-Squared Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hotelling’s T-Squared</td>
</tr>
<tr>
<td>93985.893</td>
</tr>
</tbody>
</table>

### Table 5: KMO and Bartlett’s Test

<table>
<thead>
<tr>
<th>KMO and Bartlett’s Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kaiser-Meyer-Olkin Measure of Sampling Adequacy</td>
</tr>
<tr>
<td>Bartlett’s Test of Sphericity</td>
</tr>
<tr>
<td>df</td>
</tr>
<tr>
<td>Sig</td>
</tr>
</tbody>
</table>
Indifferent based on a model proposed by Berger et al. (1993) as depicted in Figure 1.

By comparing the prioritized stakeholders’ expectations into Exciter or Attractive, Must-be, One-dimensional, or Indifferent using the Kano model, the HEA could intuitively make a decision as shown in Figure 1 (Jeon, Kim, Lee, Lee, and In, 2012). The results indicate that strategies to minimize student absenteeism would excite students, while these must-be qualities require consideration to avoid student dissatisfaction.

**Discussion**

The uniqueness of this study lies in the application of the Kano model to resolve conflicts by incorporating a perspective of understanding the criticality of needs or expectations from the major stakeholders such as academic leaders, HEAs, teachers, and students (Bate and Robert, 2007; Jeon et al., 2012; Lengnick-Hall, 1995). The various roles of a student, for example, treated as a customer (Gruber et al., 2010) in the HE process, would ensure quality of HE and improve institutions.

This study supports what is argued by Sulisworo and Maniquiz (2012) that the Kano model is a practical tool for the quality of HE to classify different stakeholder expectations, monitor those expectations, and prioritize the various action plans required to improve the system. As an example, in the Kano model, both the spoken (one-dimensional) and unspoken (attractive and must-be) expectations of stakeholders are visualized. However, the same methods cannot be used to collect data on spoken and unspoken expectations. Direct methods such as interviews can aid in identifying spoken expectations, whereas indirect methods like observations are necessary to identify unspoken expectations. Earlier studies (Keller et al., 2014; Paraschivescu and Cotirlet, 2012) indicated a challenge in using only stakeholder input from surveys or interviews when collecting expectations, as the unspoken expectations will be missing.

The study confirms this challenge, but also points to a way of overcoming it. That is, the challenge can be met by not only collecting stakeholder input through methods such as surveys, but also allowing HE internal and external stakeholders to provide input (Gustavsson et al., 2016; Lengnick-Hall, 1995). Hence, it is not only critical to use a variety of methods to collect stakeholders’ expectations, but it is also important to involve a variety of respondent groups in providing input on expectations related to the various stakeholder roles.

**Theoretical and Practical Implications**

This study suggests that HEAs must concentrate on strategies that reduce or minimize student absenteeism as an exciter or attractive quality, rather than global ranking, which is an indifferent quality. Attractive quality is an attribute that provides satisfaction when achieved fully, but does not cause dissatisfaction when not fulfilled. On the other hand, indifferent attributes refer to aspects that are neither good nor bad, and they do not result in either customer satisfaction or customer dissatisfaction.

This study confirms the conclusion of Kano et al. (1984) that blindly fulfilling stakeholder/customer expectations has risks such as providing superfluous quality. That is wowing the stakeholder/customer in one area and driving them to competitors in another; and focusing only on what stakeholders/customers say, and not what they think (Kano et al., 1984; Woodham, Williams, and McNeil, 2017).
Conclusions

The results of this study found that student absenteeism is an attractive quality. Indeed, out of 15 different types of reasons for student absenteeism from an earlier study, factors relating to courses and teachers were found to be the least significant (Longhurst, 1999). Consequently, students just go through the motions because of the dearth of reasonably attractive jobs available to them, and parental and peer-group pressure (UN Sustainable Development Goals, 2016).

The main contribution of this study is to resolve the major stakeholders’ conflicts in the HEIs using the Kano model. Looking at the various roles is a way to realize the necessity of capturing input from various stakeholders (such as academic leaders, HEAs, teachers, and students). Further, it is important to apply different methods in collecting data when assessing stakeholder expectations, as some of the expectations are explicit (expressed or spoken) and some are implicit (implied or unspoken). This study contributes to knowledge on how to combine the stakeholder expectations to resolve conflicts using the Kano model.

Limitations and Directions for Further Research

There are a number of limitations to this study. It has drawn conclusions based on responses from stakeholders in private and public HEIs in Accra, Ghana; hence, the outcome cannot be generalized. Notwithstanding, the findings could provide valuable insights to HEAs in HEIs.

Further studies could address how to initially obtain stakeholder expectations as an input before becoming a stakeholder. In order to capture these types of expectations, data collection from other respondent groups, such as external stakeholders (national university commission, non-governmental organizations, community-based organizations, parents, employers of labor, trade unions, alumni association, and industries/firms) might be a way forward in future research.

References:


Structured Creativity for Strategy Development – An Empirical Test of Effectiveness of Template Use in MBA Strategy Classes

Raghu Tadepalli and Ravi Chinta

Abstract

This article outlines the design and testing of a template-based assignment that emulates structured creativity in developing a strategy for a given firm. Learning by doing is accomplished in this course by employing directed learning through the use of templates to guide the development of strategic options. However, the use of templates is optional, and some students with work experience choose not to use them. Learning outcomes for this applied course are assessed by a rubric that closely tracks the structured creativity process enabled by the template in use. The impact of template use and work experience on the final project performance is empirically tested. The findings show that templates can enhance the quality of strategy options created in the strategy-development process for all levels of work experience with a pronounced effect on those with higher levels of experience. Therefore, template-based pedagogy in strategy-options development projects is recommended as it provides the students a richer learning experience in applying strategy concepts leading to enhanced learning outcomes.

Keywords

Teaching Strategy, Templates in Pedagogy, Learning by Doing, Bridges to Practice, Strategy Projects

Introduction

Business education has evolved as it adapts to marketplace needs. Business schools have made significant advances in the substantive content of their MBA and executive offerings during recent years, according to Mitchell (2007). While these efforts have taken root in all functional areas of management, the how-to (practical) aspects in strategy formulation are largely seen as more art than science. Gioia (2002) laments business education’s role in the crisis of corporate confidence because current offerings in academia do not promote the creativity required in strategy development. Hambrick and Fredrickson (2001) ask the simple questions, despite all the knowledge imparted in academia, “If one does have the right strategy? Or can our MBA students really do strategy practice?” Mintzberg (2004) makes a dramatic argument for reframing management education as a practical art. Datar, Garvin, and Cullen (2011) call this a crisis in business education that can only be solved with greater “integration” with reality outside of universities.

Many in academia seem to yearn for alternative pedagogical techniques by first suggesting that management education in the United States tends to be too structured around case analysis, scenarios, simulations, strategy games, best practices, and linear summaries of relevant research. Hence, management education should be supplemented by the use of other techniques, such as serious play (Burgi, Jacobs, and Roos, 2005; Statler, 2005; Roos, 2006), biographical writing (Jacobs, 2007; Learmonth, 2007), or evidence-based instruction (Rousseau and McCarthy, 2007; Klimoski, 2007). Learning by doing is one of the alternative options for pedagogy in strategy. In this article, we propose a template-based approach for strategy development that emulates a structured creativity process for effective
and efficient use of the limited time available to senior executives. This approach has been used for more than a decade in strategic management courses taught at graduate and undergraduate levels at three universities in the United States. A rubric that allows an assessment of the output ensures that strategy options appropriate to the firm are developed.

**Template as a Tool For Structured Creativity**

A template is like a jigsaw puzzle that one needs to solve. There is an underlying (latent) structure that straitjackets the amount of deviance from the overall task. Template assignments are analogous to “chose old dance lessons for which the instructor pasted footsteps on the floor” (Bean, 2011, p. 155). Others have likened templates to the sheet music that guides musicians. However, such metaphors may be too limiting to describe the utility of templates. Templates allow for structured creativity just as clear goals allow for diverse strategies in organizations. Straitjacketing so as to minimize waste without stifling creativity is a balance that good design ensures in templates. A process of brainstorming divergence followed by a process of evaluative convergence in a structured process maximizes targeted creative solutions that are goal-oriented.

**Literature Review on Link Between Structured Creativity and Outcomes**

Before discussing the specifics of using a particular template as a structured creativity tool and its effects on learning outcomes, a review of the literature is presented to provide a theoretical underpinning for the linkage between structured creativity and outcomes. In a very broad sense, Drucker defines innovation as “an application of knowledge to produce new knowledge” (Drucker, 1993). That is, new knowledge, excluding serendipitous discoveries, is structured by and emerges from extant knowledge. Such a view is consistent with Dewey’s (1938) theory of education, which suggests that structured experience and prior knowledge form the basis of education. Vygotsky (1978) contended that structure leads to better focus and coherence in student learning outcomes. Building on Bloom’s (1956) taxonomy, Anderson and Krathwohl (2001) presented a structured framework, comprised of two major dimensions—the Knowledge Dimension, which represents a range from concrete (factual) to abstract (metacognitive) and the Cognitive Process Dimension, which promotes innovative learning outcomes. A closer scrutiny of their framework reveals an underlying structure that guides the gradual movement toward higher levels of learning called metacognition combined with creation. In short, structure promotes creativity and better outcomes for students with the latest pedagogical trends manifesting in the use of simulations (Aldrich, 2005; Anderson and Lawton, 2009) and games to structure creative thinking (De Freitas, 2006; Zagal, 2010).

Structured frameworks to promote engineering creativity as well as research and development (R&D) innovations have been in use within firms for a long time (Savransky, 2000; Rantanen and Domb, 2010). For example, Quality Function Deployment and TRIZ are structured processes for inventive solutions ( Yamashina, Ito, and Kawada, 2002). In discussing problems in managing innovation in firms, Van de Ven (1986) suggests that structure and framing tend to provide focus and better results. Having definitive screening criteria can promote rather than inhibit product innovation in large firms (Dougherty, 1992). Hamel (2006) discusses twelve innovations that shaped modern management ranging from the old time-and-motion studies to current strategic, formalized analytical frameworks, which have one thing in common—an underlying structure that brings focus and promotes high quality options to solve the problem at hand. Deliberate structured creativity is manifested in product development templates (Ny, Hallstedt, Robert, and Broman, 2008); project-network templates to streamline innovations (Shenhar and Dvir, 2007; Larson and Gray, 2011); protocols in drug discovery (Karin, Yamamoto, and Wang, 2004); analytical frameworks to screen out designs (Keast and Hampson, 2007); control charts to determine process improvements (Langley, 1999; Goetsch and Davis, 2014); and even in strategic planning processes (Eden and Ackermann, 2013).

Our review of the literature reveals that templates are widely used to bring focus and improved outcomes in developing higher quality options in problem solving. Thus, templates are meta-level process constructs that are generalizable across contexts (Anderson and Krathwohl, 2001) allowing simultaneous achievement of meta-cognition and creativity. However, the use of templates has not been without criticism (Chari, Rao, and Rohatgi, 2003). While we recognize the extensive prevalence of structured creativity and its consequent benefits in the business world, this research focuses on the strategic management process (SMP) template and its consequent benefits. Specifically, this study empirically tests the expected a-priori linkage between the use of SMP templates and outcomes.

Further, this research also examines the impact of experience on the use of templates and, hence, the benefits that accrue from their use. Studies have shown that experience can sometimes lead to an illusory confidence that is dismissive of the use of templates or instructions to follow (Fellner, Güth, and Maciejovsky, 2004; Jee, Wiley, and Griffin, 2006). Experienced managers use unconscious routines, called heuristics in the literature, to cope with complex situations in decision making (Hammond, Keeney, and Raiffa, 2006; Michalewicz and Fogel, 2013); e.g., they do not use...
templates or rely on structured analyses. However, other studies have shown that when experts use templates, the outcomes were better (Linn, 1985; Riss, Cress, Kimmerle, and Martin, 2007). In fact, Karrer (2007) contends that the emerging field of artificial intelligence is based on experts using templates. Thus, the effect of work experience on the use of templates and benefits from their use is an unsettled issue that deserves further research. This study attempts to fulfill that gap in existing literature.

In summary, the literature review reveals that structured creativity (e.g., use of templates) is related to outcomes, and that work experience can also have an effect on the use of and benefits from templates. The research questions and hypotheses were developed on the use of the SMP template, which is described next in detail with a rubric for its evaluation. The SMP template and its rubric form the bedrock of this study.

Use of Template For Strategy Options Development and Evaluation

Strategic management is a capstone course that integrates all functional areas of management such as marketing, operations, finance, accounting, global supply chain, business law, business ethics, economics, and statistics. The emphasis is on developing strategic options to manage the current business to survive and also to create tomorrow’s business for growth and advancement. Much of this strategy-development work requires significant analysis and integration of all areas of management within a given firm and sensing the external environmental changes to adapt to as a firm.

There is no best strategy to showcase to students since strategy is highly contextual and the best strategy depends on the specific firm being analyzed and the precise situation in which the firm is imbedded. Good strategies result from the use of a strategic management process for a given firm in a specific situation. This is essentially a structured creativity process that the students have to demonstrate in developing the best strategy for a given firm. Such an approach has been successfully used in teaching finance curriculum (Carrithers, Bean, and Ling, 2008).

The template strategy for the written assignment is best-suited to the strategy assignment, which is about developing a thoroughly analyzed strategy for a given firm in a specific situation. The template shows all of the steps in the strategic management process that must be followed to come up with the options, which then will be evaluated to arrive at the recommended strategy. The template also serves as a scaffolding to build the final paper for the students (Cho and Schunn, 2007). A rubric that was used for the final paper grading, as noted in this article, follows the template. However, the rubric was not shared with the students.

Strategic Management Process

The strategic management process involves the following 12 steps:

1. Determine the organization’s mission, vision, values, and goals
2. Internal analysis leading to strengths and weaknesses (SW) of the firm
3. External analysis leading to opportunities and threats (OT) in the external environment
4. SWOT matrix enumeration and creative dialogue to develop options
5. Develop S + O options (at least two options in this category)
6. Develop S + T options (at least two options in this category)
7. Develop W + O options (at least two options in this category)
8. Develop W + T options (at least two options in this category)
9. Assess the options generated using the decision criteria
10. Evaluate options to create a rank-ordered list of the options
11. Recommend strategy with rationale on why it was chosen
12. Develop implementation plan

Students are given the following assignment: Imagine that you are a highly paid strategy consultant from McKinsey, Bain, Boston Consulting Group or Mercer, etc., hired by a firm to execute the SMP to recommend a strategy for implementation. For the firm that hired you, write an eight-page analytical report (double-spaced, 12-point font), excluding any supporting appendices, with a final recommendation for a strategy to be implemented. You are expected to follow the SMP process and touch on all the steps outlined above. Write “not applicable” if you are skipping any step with some explanation why that step ought to be skipped.

In the above analytical paper, students are expected to learn the critical lesson that strategy is essentially based on marrying an internal aspect to an external aspect of the firm’s environment with the objective of sustainably creating and capturing value. That is why strategy consultants are so highly paid. Students are told to follow the template (the SMP process) but ensure the generation of value-creating options that are significant and context-specific. Simply stated, students are advised not to stay in the conceptual clouds but instead be specific to the firm analyzed. They are taught how to compose strategy from its essential components and also how to decompose a strategy into its essential elements. In doing so, the intent is to help students understand that they can apply the SMP process to any system that they will manage. See Table 1 for the rubric used.

To what extent does template-driven pedagogy improve learning outcomes in a strategy class that is oriented toward the creative development of strategy options for a given firm?
Relative to students with no work experience, those who have work experience intuitively know that structured processes can lead to the generation of more relevant options to solve a problem. Thus, the level of work experience among students impacts the use of structured templates (Alexander, 2003). Therefore, the following research questions and hypotheses were developed for this study as shown in Table 2.

Four sections of an MBA strategy course with a total of 110 students comprised the sample for this study. In two sections, the 12-step strategic planning process was introduced at the beginning of the course to all students with instructions that use of the process template is optional but useful. In the other two sections, the template was not introduced, although the same strategic planning process was described as a concept without the structure of a template. That is, two sections had the templates and two did not.

The rubric for grading the final paper was not provided to the students before but was available to them after the final papers were graded. The assignment for each student was to analyze a firm and recommend a strategy. The final strategy recommendation paper was due at the end of the semester. Students must describe the strategic analyses and evaluation before recommending a strategy. Work-experience data on students were collected at the beginning of the course on an index card in which each student also described his/her expectations of the course.

The dependent variable is the final paper scores that were based on the rubric described earlier. This score is a proxy measure for the learning outcomes for the students. The final paper score was a maximum of 20 points with a bonus of 10% for outstanding work. While grading the final paper for each student, the instructor could easily identify those students who did not use the template even in the sections where the template was introduced. The work-experience data from the index cards were used to categorize the students into four groups on the work-experience variable: (1) none, (2) low (<3 years), (3) medium (<8 years) and (4) high (>8 years).

<table>
<thead>
<tr>
<th>Rubric (Evaluative criteria with weights)</th>
<th>Poor (far below expectations) 0%</th>
<th>Inadequate (below expectations) 50%</th>
<th>Adequate (meets expectations) 75%</th>
<th>Excellent (exceeds expectations) 100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mission, vision, values and goals</td>
<td>5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal analysis leading to strengths and weaknesses (SW)</td>
<td>10%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>External analysis leading to opportunities and threats in the external environment (OT)</td>
<td>10%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SWOT matrix enumeration for creative dialogue on options</td>
<td>5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S + O options (at least two options in this category) to create value</td>
<td>10%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S + T options (at least two options in this category) to create value</td>
<td>10%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W + O options (at least two options in this category) to create value</td>
<td>10%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W + T options (at least two options in this category) to create value</td>
<td>10%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decision criteria to assess the options generated</td>
<td>10%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Options evaluation leading to a rank-ordered list of the options</td>
<td>10%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recommended strategy with rationale why it is chosen</td>
<td>5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implementation plan</td>
<td>5%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Null Hypotheses</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ1: Is there a difference in learning outcomes between students who use the strategic management process template and those who do not?</td>
<td>H01: Learning outcomes do not differ between students who use the strategic management process template and those who do not.</td>
</tr>
<tr>
<td>RQ2: Is there a difference in learning outcomes between students who have work experience and those who do not?</td>
<td>H02: Learning outcomes do not differ between students who have work experience and those who do not.</td>
</tr>
<tr>
<td>RQ3: Is there a difference in learning outcomes based on work experience and use of the strategic management process template?</td>
<td>H03: Learning outcomes do not differ based on work experience and the use of the strategic management process template.</td>
</tr>
</tbody>
</table>
years). The composition of the sample of 110 students in terms of the variables in the study is shown in Table 3. The sample was comprised of 14.5% of students with no work experience, 31.8% of students with less than three years of work experience, 28.1% of students with less than eight years of experience, and 23.6% students with more than eight years of work experience. Further, the sample was comprised of 55.4% of students who used the process template and 44.6% of students who did not use the template.

**Results and Discussion**

The two-way analysis of variance was conducted to investigate the main effects of template use and work experience on the final paper scores. ANOVA results, presented in Table 4, show a significant main effect of template use \([F(1,100) = 32.7, p = 0.00, \text{partial eta square } = 0.246]\) and work experience \([F(3,100) = 5.23, p = 0.02, \text{partial eta square } = 0.136]\). Interaction between the template use and work experience is also significant \([F(3,100) = 4.53, p = 0.05, \text{partial eta square } = 0.12]\).

The line plots (final exam scores versus work-experience graphs), provided in Figure 1, show that the two lines do not cross for the two groups that used and did not use the template. However, the interaction term in ANOVA shows that the interaction between the template use and work experience is statistically significant. This demonstrates that there is not ordinal interaction between template use and work experience. Ordinal interaction is a situation where the main effects still hold even when the factors interact with each other significantly. Disordinal interaction exists when the lines cross each other and when this happens, the main effects do not make any sense (Mertler and Vannatta, 2013). In summary, the results show that the main effects and interaction effect are all statistically significant. That is, the three hypotheses (H1, H2, and H3) are all supported.

The Scheffe post-hoc test was conducted to determine which levels of work experience were significant. The results revealed that the students with no work experience did not differ from students with low levels of work experience (less than three years of experience) but differed significantly from students with medium (between three and eight years of experience) and high (more than eight years of experience) levels of work experience. This finding is in line with Alexander (2003), who posits that the journey from application to proficiency does take time.

The support for hypothesis 3 in Table 5 and Figure 1 show a statistically significant and positive effect of the interaction between work experience and template use on outcomes. What is more interesting is that the effect of the interaction is more pronounced at the two ends of work experience. That is, those with low work experience and also those with high levels of work experience achieve a higher level of outcomes when templates are used.

**Conclusion**

The capstone course, strategic management, has been globally taught in business schools after the Association to Advance Collegiate Schools of Business made it a requirement to emphasize integration across the business curriculum. As the world transitions toward an increasingly interconnected global

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**Table 3: Frequency Tabulation of Respondents**

<table>
<thead>
<tr>
<th>Value Label</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process template use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Used process template</td>
<td>61</td>
<td>55.4%</td>
</tr>
<tr>
<td>2 Did not use process template</td>
<td>47</td>
<td>44.6%</td>
</tr>
<tr>
<td>Work experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 None (0 years)</td>
<td>16</td>
<td>14.5%</td>
</tr>
<tr>
<td>2 Low (&lt; 3 years)</td>
<td>35</td>
<td>31.8%</td>
</tr>
<tr>
<td>3 Medium (&lt; 8 years)</td>
<td>31</td>
<td>28.1%</td>
</tr>
<tr>
<td>4 High (&gt; 8 years)</td>
<td>26</td>
<td>23.6%</td>
</tr>
</tbody>
</table>

**Table 4: ANOVA Summary for Main Effects and Interaction of Template Use and Work Experience**

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected model</td>
<td>744.971(^a)</td>
<td>7</td>
<td>106.424</td>
<td>8.129</td>
<td>.000</td>
<td>.363</td>
</tr>
<tr>
<td>Intercept</td>
<td>22806.805</td>
<td>1</td>
<td>22806.805</td>
<td>1742.133</td>
<td>.000</td>
<td>.946</td>
</tr>
<tr>
<td>Process template use</td>
<td>427.586</td>
<td>1</td>
<td>427.586</td>
<td>32.662</td>
<td>.000</td>
<td>.246</td>
</tr>
<tr>
<td>Work experience</td>
<td>205.502</td>
<td>3</td>
<td>68.501</td>
<td>5.233</td>
<td>.002</td>
<td>.136</td>
</tr>
<tr>
<td>Interaction effect (Process template use * work experience)</td>
<td>177.913</td>
<td>3</td>
<td>59.304</td>
<td>4.530</td>
<td>.005</td>
<td>.120</td>
</tr>
<tr>
<td>Error</td>
<td>1309.131</td>
<td>100</td>
<td>13.091</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>28971.000</td>
<td>108</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected total</td>
<td>2054.102</td>
<td>107</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(\text{a. R Squared } = .363 \text{ (Adjusted R Squared } = .318)\)
A knowledge economy is surfacing (Spring, 2008), whereby students must be well-educated to prepare them for the global workplace. In seeking global competitive differentiation, business schools have employed many approaches to incorporate both the theory and practice of strategy into capstone courses. Some have introduced a common company case for use in all functional area courses, and that company would then be subjected to an in-depth, strategy-development exercise in the strategy course. Alternative pedagogical techniques structured around case analysis, scenarios, simulations, strategy games, best practices, and linear summaries of relevant research are among the ways in which students have been exposed to the real-life practice of strategy (Chinta, 2009). Mang (2000) suggests that strategy is an evolving mosaic that is also experiential and proposes that students should be given a learning opportunity to understand the intricacies of strategy by actually doing it. The integrative strategy course, while cumulative in its essence, can benefit from structured approaches to promote creative thinking. As Rindova and Kotha (2001) suggest, continuous morphing and adaptation to changing contexts (hence attaining an enhanced knowledge level) becomes a normal part of the learning process for MBA students in a structured creativity assignment that generates different strategies for various contexts. Jiang and Murphy (2007) dispel the popular myth that business educators are ineffective managers in the real world.

To be sure, the proposed structured creativity tool using a template in one strategy course is not a panacea, but it is certainly a step in the right direction. Its strength comes from actual and sustained use in the real work of strategy practitioners. Its simplicity stems from students learning by doing. Its tenacity results from its flexibility to be molded in accordance with the constantly evolving context. Its intelligence comes from students experiencing “strategy concepts in play.” In conclusion, structured creativity tools such as the template employed in our pedagogy is an integral and required part of an MBA curriculum.

The limitations of this study include the lack of an experimental design, cross-sectional data, a student sample, and a relatively small sample size. Our study results possess limited generalizability due to the non-experimental design (Shadish,
Cook, and Campbell, 2002). One significant limitation of this study is the size and nature of the sample. Cohen (1992) suggested that at significance levels of 0.05 and a power of 0.80, one would need a sample size of 783 respondents to detect a small effect (r=0.10), 85 respondents to detect a medium effect (r=0.30), and 28 respondents to detect a large effect (r=0.50). Our sample size of 110 students makes detecting small effects difficult. Additionally, student sample size limits the generalizability of the findings to organizational contexts.

Multiple avenues exist for future research using the template approach tested in this article. An increasing number of MBA programs are admitting students with little or no work experience. The template approach can be used to assess the extent to which the strategic management course enhances their integration of business material. Similarly, many graduate programs admit large numbers of international students. Many of these students come from countries where the lecture method of instruction is dominant. Students are seen as passive learners who regurgitate material during exams. Many of these students often have little or no work experience. The template approach can be used to determine if these students are better able to integrate material after learning this approach. Additionally, a before-after measure in all of the above cases would help assess whether there is statistically significant improvement in learning from using the template approach. Finally, as MBA programs work to increase the number of minority and female graduates, it is necessary to determine whether the teaching approaches used in business classes (especially quantitative courses such as finance, accounting, and quantitative methods) impact enrollment of women and minorities. It would be interesting to test whether the template approach, which emphasizes learning by doing, enhances the ability of women and minority students to integrate across functions and thereby enhances their learning and eventual success in the courses.

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A Lean Six Sigma Approach for Improving Utilization of Walk-In Tutors

Sandra Furterer, Kellie Schneider, Michael B. Key, and Yusheng Zhang

Abstract
The purpose of this study was to improve the utilization of walk-in tutors at the University of Dayton. The Lean Six Sigma methodology is used to identify factors that contribute to the use of walk-in tutors, identify opportunities for improvement, and ensure process improvements are maintained. The goal of this case study was to identify factors that improve walk-in tutor utilization to allow for more efficient and effective tutor staffing and assignment procedures. The methodology and processes outlined in this case study may be implemented at other higher education institutions to improve the efficiency and cost effectiveness of their walk-in tutoring programs and as a guide for improving other processes within institutions.

Keywords
Lean Six Sigma, Engineering Education, Higher Education

Introduction
Many higher education institutions (HEIs) struggle to stabilize the fluctuating operational costs and justify idle time apparent in walk-in tutoring services. This case study is an example of adopting Lean Six Sigma (LSS) within HEIs to improve tutoring center operations, specifically hiring, scheduling, managing, and collecting data within a walk-in tutoring model. Analysis of recommended improvement strategies showed successful modifications to a walk-in tutoring model to forecast utilization and decrease idle time.

This case study is only one example of the vast applications of LSS for enhancing the knowledge and skills of program coordinators, directors, and administrators in higher education. Institutions of higher education are beginning to discover more applications of LSS, such as combining the principles of Six Sigma and quality management (Adina-Petruţa and Roxana, 2014); improving online education (Bandyopadhyay, 2014); assessing student surveys (Al Kuwaiti and Subbarayalu, 2015); as well as pedagogy and professional development (Tetteh, 2015). Additionally, a special journal issue on LSS in higher education was published (Antony, 2015). This special journal issue included papers discussing the specific issues faced by HEIs when implementing LSS (Balzer, Brodke, and Kizhakethalackal, 2015; Waterbury, 2015); implementation of LSS in King Abdullah University of Science and Technology (Svensson, Antony, Ba-Essa, Bakhsh, and Alblawi, 2015); as well as the differences in implementing LSS in further educational institutions compared to HEIs (Thomas, Antony, Francis, and Fisher, 2015). The journal also discussed applying Lean wastes to HEIs as well as 5S, point-of-use storage, process mapping, value-stream mapping, and level scheduling (Douglas, Antony, and Douglas, 2015).

Furterer and Crumpton-Young (2005) incorporated LSS experiential learning opportunities into a graduate industrial engineering and management systems course at the University of Central Florida. The students performed real-world LSS projects to improve the university’s processes. The student projects focused on teaching and learning. An LSS project improved a WebCT course development and design process (Sharawi, Sha, Rajendran, and Furterer, 2007). Another LSS project designed a process management model to achieve operational excellence using Six Sigma tools (Rodrigues et al., 2006).
The faculty accreditation process was improved (Furterer et al., 2006a). Asset management processes were also improved at the university (Martinez et al., 2006). Another LSS project used a balanced scorecard in a Six Sigma academic improvement project (Akinrefon et al., 2005). A graduate student management program was improved using LSS (Nahmens et al., 2005). LSS was used by another student team to improve education delivery system processes (Sharma et al., 2005). Other projects performed by students focused on administrative processes. For example, an LSS project improved web development and design processes within the university (Furterer et al., 2006b) and National Panhellenic Conference recruitment processes at the University of Central Florida were improved (Jenness et al., 2006). A university LSS team developed a framework to incorporate Six Sigma problem solving to achieve operational excellence in the university (Furterer et al., 2005). Finally, the recruiting of university students was improved through the application of the Six Sigma DMAIC methodology and tools (Furterer, Hassan, McMurray, Rowe, and Smith, 2007) by applying LSS as an improvement tool in academia (Coowar and Furterer, 2006). This vast body of research exemplifies how LSS was applied in higher education across a wide variety of processes.

With the need to be more frugal, universities are turning to process improvement methodologies such as LSS and quality-based tools to reduce the cost of administrative activities, as well as teaching and learning processes, as discussed in the methodology section.

**Methodology**

Furterer, Schneider, Key, and Zhang (2017) showed how LSS was applied to higher education in a tutoring administrative department to improve tutor utilization and efficiency. The University of Dayton hired a Learning Initiatives Coordinator in August 2015 to coordinate tutoring services for the Office of Learning Resources. Improvement goals were already set toward minimizing idle time in walk-in tutoring. The first action of the Learning Initiatives Coordinator was to move any course in the Engineering Management, Systems, and Technology department to mentor a graduate student in conducting an LSS analysis as a capstone project, sponsored by the Office of Learning Resources. The primary roadblock for the project’s success was the administration’s hesitation to accept improvement recommendations from graduate research. Therefore, another faculty member from the department with professional experience applying LSS methodology to aspects of HEIs joined the team. The project is ongoing due to the recommended improvements and control factors identified by this case study.

The research team chose to complete a case study to apply the LSS methodology to the campus tutoring center because of the many factors that exist in the tutoring process, which must be understood to improve process quality and maintain control of the process. LSS allows action researchers to collaborate objectively with stakeholders to improve processes. This collaborative case study used the LSS Define-Measure-Analyze-Improve-Control (DMAIC) methodology to improve tutoring processes at the University of Dayton. In the Define phase, the team developed the problem statement to gain an understanding of the gaps in the process, created the project charter to reach agreement on the project goals, and performed a stakeholder analysis to identify stakeholders impacted by the process and the project. The team used a Suppliers-Inputs-Process-Outputs-Customers (SIPOC) tool to understand the five to seven high-level activities to be improved. Finally, in the Define phase, the project manager developed a project plan, which guided the successful completion of the project.

The Measure phase relied on subject-matter experts to observe operational processes and create process maps. The team developed a data-collection plan to identify the metrics and data necessary to understand the current processes. Understanding customer needs related to each process was essential in identifying the Critical-to-Satisfaction (CTS) characteristics. The research team used descriptive, graphical, and inferential statistics to understand the processes and factors that significantly affect the tutoring process.

The Analyze phase identified factors and root causes contributing to problems in the process by using a why-why analysis. The research team generated recommendations in the Improve phase to adapt processes, based on implementing and measuring them, to assess the improvement to each process. Finally, in the Control phase, control plans were developed and implemented to maintain process improvements.

The following is a description of the LSS DMAIC methodology applied to the higher-education tutoring-improvement process.

**Define Phase**

The team that embarked on the LSS tutoring project included an Engineering Management master’s student; two faculty members from the Engineering Management, Systems, and Technology department—one of whom is a Six Sigma Master Black Belt; and the Learning Initiatives Coordinator from the Office of Learning Resources. The project charter is explained below.

**Overview:** Walk-in tutoring is the most popular operation model for tutoring centers. While this model is
especially convenient for students, it can often result in low tutor utilization.

**Problem statement:** Tutoring utilization for walk-in tutoring has historically been quite low. For the Spring 2015 semester utilization was 37.7%, 44.5% for Fall 2015, and 17.4% in Spring 2016. The coordinator schedules tutors at 75% of the historical demand for the walk-in shifts, but this has resulted in low utilization. A new model is needed to improve tutoring utilization and reduce salary costs for idle tutors.

**Goals:** The purpose is to improve the utilization of walk-in tutors at the university. Key project goals include: understanding the factors that contribute to tutor utilization, establishing appropriate tutor utilization goals, and improving the tutor scheduling process.

**Scope:** The processes included in this study are: hiring tutors; scheduling tutors; managing walk-in tutoring appointments; and collecting tutoring visit, work, and customer satisfaction data. This project excludes student athletes and students with disabilities, unless a tutor scheduled for walk-in sessions tutors them during a scheduled shift. Baseline metrics were developed based on data from the Spring 2015, Fall 2015, and Spring 2016 semesters. Data was collected and improvements were implemented to assess increases in tutor utilization in Fall 2016.

The CTS criteria for the tutoring processes determined by the team are:

- Tutor utilization: total tutoring time divided by total tutor scheduled time.
- Student wait time: time students wait for their walk-in tutoring session to begin.

The stakeholder analysis identifies the project stakeholders, their role in the project, their potential impacts and concerns, and their initial and future receptivity to the project. This analysis is an important tool for identifying and engaging the appropriate stakeholder groups and ensuring that their support is gained by the end of the project. There were three key primary stakeholder groups: tutoring coordinator—representing the tutoring department administration, students who are tutored, and the tutors who provide student tutoring during the walk-in appointments.

The tutoring coordinator hires tutors, staff, and schedules the tutors for both walk-in tutoring and appointments. This person manages the walk-in visits as well. The tutoring coordinator is mainly concerned with tutor utilization that contributes to maintaining the department budget. In the past, the tutoring coordinator hired a high volume of tutors who were not highly utilized, which contributed to at least a 50% higher volume of tutors.

The students to be tutored included those who arrived without an appointment to request tutoring. They were mainly concerned with having a low wait time and gaining knowledge of the subject matter. The tutor stakeholder group were the tutors who provided tutoring and were primarily concerned with helping students learn the subject matter and getting paid to do so. The tutoring coordinator was highly supportive of the project, having reached out to the LSS experts for guidance. The students who were tutored were unaware of the special LSS project; therefore, they were neutral stakeholders from a project-engagement perspective. The tutors were moderately supportive of the LSS project. Both the tutors and the tutoring coordinator needed to be strong supporters of the project by the time the improvements were implemented.

The team applied a project risk analysis to assess any risks that existed, which could derail the successful implementation of improvements to the tutoring processes. The only risk identified was in the ability to perform the appropriate measurement system analysis to assess data accuracy. This was an important element of ensuring that the tutors recorded the data in an unbiased and complete manner. The tutoring coordinator reviewed and assessed the accuracy of the data and removed inaccurate or incomplete data as appropriate.

The SIPOC diagram, shown in Figure 1, identifies needed improvements to the major activities of the processes, along with the suppliers and their inputs to the activities, the outputs of the process activities, and the customers of the inputs. It provides a check and balance to the stakeholder analysis to identify all appropriate stakeholders and validate the scope of the processes to be improved.

The team identified the key milestones and activities to ensure that the project activities would be completed.

Define phase activities:

- Create project charter, plan, and stakeholder analysis.
- Perform stakeholder analysis and identify CTS characteristics.
- Select team and launch project.

Measure phase activities:

- Define the current process and voice of process (VOP).
- Validate measurement system.

Analyze phase activities:

- Develop cause and effect relationships.
- Determine and validate root causes.
Improve phase activities:

• Design future state.
• Establish performance targets and project scorecard.
• Gain approval to implement, train, and pilot.

Control phase activities:

• Implement improvement recommendations and manage change.
• Incorporate process control plans and scorecards.
• Implement continuous improvement cycle: plan, do, check, act (PDCA).

Measure Phase

The data collection plan identifies and defines the metrics for measuring the CTS characteristics that are important to the customers and processes. The metrics for the two CTS characteristics were identified as tutor utilization percentage and average wait time. Tutor utilization was calculated as the total tutoring time divided by the total tutoring scheduled time. The average wait time was the average time from when the students signed in to when the tutoring session began. The data collected was from an existing tutoring database for the Spring 2015, Fall 2015, and Spring 2016 semesters.

The team developed process maps for each of the customer-facing activities in the SIPOC tool, with an example of one of them, walk-in tutoring, shown in Figure 2. This unique, process-architecture map tool combines the process flow of the activities with the role that performs each activity, the documents and information systems used within each activity, and additional knowledge that is important to capture to help perform the process accurately and consistently. The process map can be used as a training and improvement tool. (Furterer, 2017)

For this particular process, when the student arrives to the tutoring center, the Customer Service Associate (CSA) screens the person to determine his or her tutoring need and whether the student possesses the appropriate materials (e.g., textbook, class notes) to commence the tutoring session. If the student is not prepared, he or she is sent to obtain the materials and return later. The CSA also verifies that a tutor is available. If a tutor is available, the tutoring session begins. If a tutor is not available, the student waits until the tutor is available. If the tutoring session extends past 45 minutes and then 60 minutes, an automated reminder is sent to the tutor, and the tutoring manager performs a debrief with the tutor. Learning of the subject matter typically occurs in 45 minutes or less. If the session lasts longer, the student may simply be trying to complete his or her homework assignment, and no additional subject-matter knowledge is being transferred. When the tutoring session is complete, the tutor swipes the student out, which shows the tutor as available and the customer-satisfaction log is completed by the student.

To collect the VOP data, the Master Black Belt performed the statistical analysis on the tutoring data collected from the TutorTrac data management system. Each visit included tutee demographics and tutor visit data, including gender, ethnicity, nationality, college, major, GPA, athlete type, tutoring type, subject, tutor time in and out, tutor total time, and number of visits this semester for each student.

Additionally, the Learning Initiatives Coordinator included each tutor’s scheduled hours. The baseline for tutor utilization was calculated as:

\[
\frac{\text{total tutoring time}}{\text{total scheduled time}}
\]

In Spring 2015 and Fall 2015, the tutoring utilization percentage ranged from 37.7% to 44.5%.
Tutor utilization decreased to 17.4% in Spring 2016 due to replacing graduating tutors. The new tutors tended to be less productive than the more experienced and older tutors.

**Analyze Phase**

The team investigated the impact of class on the mean time of visit as well as number of visits, which are shown in Figure 3. Freshmen have a higher mean time of the tutoring visit and a higher number of visits for walk-in tutoring. Sophomores also have a higher number of walk-in tutoring visits. These trends were expected since most of the courses supported are for freshmen and sophomore students.

Some other interesting findings in the Fall 2016 tutoring data included:

- The average tutoring time for the sessions tended to decrease with an increase in the students’ GPA, and there were more visits from those with a GPA between 3.0 and 3.49:
  - GPA of < 2.0: mean time of visit = 63.9 minutes, 52 visits
  - GPA of 2.0 to 2.49: mean time of visit = 55.3 minutes, 143 visits
  - GPA of 2.5 to 2.99: mean time of visit = 59.8 minutes, 298 visits
  - GPA of 3.0 to 3.49: mean time of visit = 59.1 minutes, 585 visits
  - GPA of > 3.5: mean time of visit = 55.0 minutes, 376 visits
- The average tutoring time was fairly consistent by college/school, and number of visits was as follows:
  - Arts & Sciences: mean time of visit = 58.6 minutes, 563 visits
  - Business: mean time of visit = 57.3 minutes, 365 visits
  - Education: mean time of visit = 57.2 minutes, 190 visits
  - Engineering: mean time of visit = 58.2 minutes, 335 visits

![Figure 2: Process Map for Walk-In Tutoring](image-url)

![Figure 3: Mean Time of Visits and Number of Visits by Class for Fall 2016](image-url)
• The number of visits by specific tutors varied from nine to 57. The average tutoring time also varied by tutor from 51.6 to 81.8 minutes. This demonstrates that there is quite a bit of variability in the tutor practices and their ability to tutor across different subject matters.

• The number of visits and mean time of the visit were higher for women (895 visits, 58.2 minutes) compared to male students (559 visits, 57.6 minutes).

• The number of visits varied by week of the semester, most likely aligning to exam and assignment schedules.

• Math had the highest number of visits for Fall 2016 with 904 visits, followed by chemistry with 316, constituting 84% of the visits for walk-in appointments.

• The number of visits was statistically significant, at an alpha of 0.10, for:
  - Class
  - College
  - Nationality
  - Ethnicity
  - GPA
  - Week of semester
  - Interaction of gender and class
  - Interaction of gender and GPA
  - Interaction of gender and week of semester

The team performed a why-why analysis, shown in Figure 4, on the question, “Why is tutor utilization low?” and identified

Figure 4: Why-why Diagram
the following root causes: changes in university class schedule, not considering best practices, and no incentive for reducing budget. During the Measure phase, it became apparent to collect detailed utilization, work, and wait-time data.

**Improve Phase**

The team brainstormed improvement ideas and performed a Quality Function Deployment (QFD) House of Quality, shown in Figure 5. The QFD House of Quality ensured that the improvement recommendations were prioritized and aligned with the CTS criteria.

One way to increase tutor utilization is to allow scheduled appointments during walk-in tutoring hours. With this hybrid model, tutors would meet with tutees at walk-in tutoring when they are not meeting with students who had previously scheduled an appointment. Allowing appointments during walk-in times may also assist in appropriately forecasting demand and adjusting staffing needs.

The team plans to investigate strategies for assigning tutors to students during walk-in hours. The current assignment policy prioritizes scheduling tutors with the smallest course profile over tutors with the largest course profile. This means tutors with larger course profiles are likely underutilized compared to tutors who support only a few courses. In a related project, different strategies for the assignment process to identify opportunities for further improvement are being investigated.

To improve scheduling efficiency, it may be helpful to create desired course portfolios to assist in the hiring process. For example, it may be desirable for students who are able to tutor the calculus sequences to also provide tutoring for chemistry and physics courses.

Currently, walk-in tutoring takes place in a location that does not become available until 6:30 p.m. Based on historical data, students prefer earlier tutoring times. Therefore, it may be beneficial to identify other spaces on campus that would allow walk-in tutoring to begin earlier in the day.

**Control Phase**

In the Control phase, the team developed a control plan to maintain new process improvements. The following process steps that need to be controlled and their control mechanism are provided.

- **Hire tutors:** Hire based upon critical tutor visit factors, measured by tutor utilization.
- **Schedule tutors:** Implement statistical process control charts to measure tutor utilization on a daily basis.
- **Manage walk-in tutors:** Implement statistical process control charts to measure wait time on a daily basis.
- **Collect tutor data:** Ensure tutoring visit and work data is collected weekly as measured by tutor utilization and wait times.

The actions to be taken if the process is out of control is to investigate assignable causes and correct the process as required. The control plan owner is the tutoring coordinator.

The following improvements, based on a scheduling approach, were implemented in the Fall 2016 semester:

- **Reduced the number of classes for walk-in tutoring to focus on high-volume courses.**

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**Figure 5: Quality Function Deployment House of Quality**

<table>
<thead>
<tr>
<th>Improvement Category</th>
<th>Tutor utilization</th>
<th>Tutor assignment strategies</th>
<th>Tutoring location</th>
<th>Course portfolios</th>
<th>Student wait time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Importance</td>
<td>10</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>Absolute weight</td>
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<td>111</td>
<td>90</td>
<td>111</td>
<td>97</td>
</tr>
<tr>
<td>Relative weight</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>1</td>
<td>4</td>
</tr>
</tbody>
</table>
• Incorporated a hybrid scheduling approach, using the tutors for walk-ins and appointments during the same time.

The Fall 2016 utilization was 62%, a significant improvement from the prior semesters, as shown in Figure 6. This resulted in an 18% to 45% improvement compared to previous semesters.

**Figure 6: Tutor Utilization Percentage**

### Conclusions and Future Work

The LSS project was successful in improving tutor utilization for the Office of Learning Resources Tutoring Center. The department plans to incorporate continuous process improvement in the future. This case study can be used as a guide for other HEIs that would like to improve processes, enhance quality and efficiency, and reduce costs of providing services in higher education.

The team will investigate and implement the following improvements in the future.

- **Investigate strategies for assigning tutors to clients.**
  Currently, the assignment of tutors is done first for those who have skills for tutoring fewer subjects, negatively impacting the utilization of tutors who can work across more subjects. Different approaches would be designed and tested. A possible strategy would be to assign tutors so that the average and variance of the individual tutor utilization are considered when assigning tutors, instead of just which subject areas they can tutor. The next improvement idea would help facilitate the understanding of the average and variance of individual tutors’ utilization.

- **Monitor weekly utilization of individual tutors via statistical process control.**
  Individual, moving-range control charts would be used to ensure that tutors maintain an “in control” utilization for the days they are working related to their tutoring utilization, both for their average and variation. The quality characteristic would be to measure individual tutor utilization as the number of hours spent tutoring divided by the scheduled tutor hours. The current metric aggregates actual tutoring hours and scheduled hours across all of the tutors for an entire semester. There would be value in understanding the utilization for each tutor on a weekly basis.

- **Identify course portfolio preferences for tutor hiring.**
  When hiring tutors, consider the portfolio of courses that they can tutor and hire based on the historical and proposed course needs. This would require aligning with the course schedules and needs of the professors and students. A new process for defining tutoring requirements each semester would need to be developed using historical data available.

- **Identify tutoring location that will allow for expanded hours.**
  Currently, the tutoring location is also used as a classroom, and tutoring cannot start until 6:30 p.m. The tutoring department would like to look for a new location that is not restricted by the class schedule and where tutoring can begin earlier in the day.

The department also plans to share the success of this project with other departments to help promote the value of LSS methods and tools in higher education. The department manager is extremely satisfied with the results of this study and has already requested a new LSS project to improve the hiring and training process for more than 200 student-employees.

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Exploring the Role of Information Technology Leadership in Higher Education: Implications for Total Quality Management

Louis Hickman and Mesut Akdere

Abstract

The current shortage of highly skilled employees across the country continues to be a concern for higher education institutions facing flat and decreasing funding. Information technology expands the reach of education via distance education, simulation technology, massively open online courses, and more. Information technology departments are responsible for identifying transformational change opportunities, implementing technologies that expand the reach of universities, and operating efficiently with flat funding. Identifying effective information technology leadership practices to enable change and reduce costs is vital for modern higher education institutions. Utilizing a literature review, existing findings and gaps are identified in information technology leadership research before relating those findings to Total Quality Management. Transformational leadership may help counteract the forces in higher education that resist change. Information technology leaders are uniquely positioned because they have both information technology and higher education knowledge, enabling them to serve as invaluable partners as higher education institutions attempt to provide value in a rapidly changing world.

Keywords

Information Technology, Leadership, Higher Education, Total Quality Management

Introduction

Leadership is widely recognized as the most important element in Total Quality Management (TQM) success. Information technology (IT) is similarly important because it helps to generate the information for making data-driven, quality decisions and for managing and updating business processes. Leadership in the IT context can be essential for TQM success. IT leaders are uniquely positioned because their work is poorly understood by much of the university, but that work can be vital to establishing and maintaining a competitive advantage (Bhatt, Grover, & Grover, 2005). Business knowledge is one of the most widely studied antecedents to IT value generation (cf. Reich & Benbasat, 2000). In the higher education (HE) context, business knowledge means that IT leaders must understand how to drive both faculty and administrative success. With adequate business knowledge, IT leaders have the potential to serve as partners who understand the levers of the wider university and can collaborate on projects that increase the efficiency of the university.

Of Deming’s 14 points for TQM (Kanji, 1990), IT leadership is, by nature, directly involved in instituting leadership, driving out fear, and breaking down barriers. Collaboration and communication are necessary for any IT solution to benefit the institution. IT continues to increase in importance in HE as universities expand their use of massively open online courses, simulation technology, big data, and distance education. Additionally, many efficiency gains in HE processes are due to IT systems eliminating existing bureaucratic, labor-driven job processes by replacing them with innovative lean systems. Considering the importance of leadership for both TQM and IT, the funding
challenges facing HE institutions, and general societal upheaval, the leadership behaviors that demonstrate a commitment to quality and an ability to enable technological change are vital for the future success of HE.

**Leadership in Higher Education**

The future of HE is considered a part of global competitiveness as emerging economic powers increase their investment in HE. As such, it has been suggested that the future of HE in the United States is reliant on leadership that enables productive and change-capable organizational cultures (Fullan & Scott, 2009). The HE leadership research has missed opportunities by failing to investigate how leadership can create change, provide organizational direction, and support organizational effectiveness (Kezar, Carducci, & Contreras-McGavin, 2006). One contributor to this shortcoming is that public HE faces governance barriers to change due to public oversight that may resist change (Leih & Teece, 2016). Adaptive, change-oriented organizational cultures cannot be created in a traditional, hierarchical fashion focused on management. Rather, a collective, collaborative, and team-oriented style of leadership has become increasingly necessary as HE faces growing challenges (Kezar, Carducci, & Contreras-McGavin, 2006).

The emphasis on collaboration is important because one or two persons cannot solve the problems HE faces today. Previously, funding was expected to increase continuously along with tax revenues. Today, tax revenues are flat in many states while, simultaneously, public HE serves more students than ever. HE leaders must bring stakeholders together from both inside and outside of their institutions. Simply pulling together a group of people with different agendas, perceptions, and skills can be key for transformational change in HE (Padró, 2010). Establishing collaborative efforts is likely to require social capital (Bolden, Petrov, & Gosling, 2008), which is developed by creating connections with the leadership throughout the institution. Voluntary coordination and collaboration with stakeholders has been proposed as the solution to the IT-business gap because it develops trusting relationships and improves organizational agility (Hickman & Akdere, 2017a). Our attention now turns to how IT is positioned to tackle the challenges facing HE leadership.

**Information Technology Leadership**

Transformational leadership (TL) is comprised of the four I’s: idealized influence, inspirational motivation, individualized consideration, and intellectual stimulation (Bass & Avolio, 1990). TL is one of the most widely explored leadership types (Day, Fleenor, Arwater, Sturm, & McKee, 2014; Akdere, 2015b; Top, Akdere, & Tarcan, 2015), and it is the most commonly studied leadership style in the IT context (Hickman & Akdere, 2017b). TL is especially important in gaining employee commitment in the non-profit context (Rowold, Borgmann, & Bormann, 2014). Leadership, rather than management, is particularly important for IT because expertise is distributed and requires collaboration to combine into valuable solutions, much like improving the HE organization. For this very reason, Hill (1992) argued that leadership is a vital dimension to consider when assessing technical professionals. Leadership is important for technology adoption in the HE context (Keengwe, Kidd, & Kyei-Blankson, 2009), a key component of any IT-enabled change. TL would help gain employee commitment to change because employees would be considered in the process, influenced individually to become motivated to perform in the new way of working, and stimulated by the challenge.

While it has been argued that chief information officers widely practice TL because it enables organizational transformation (McLean & Smits, 2014), the HE context faces additional barriers. While TL practices have been found to be high among IT executives in HE, IT employees do not consider the climate conducive to innovation (Katz & Salaway, 2004). The additional barriers faced in HE limit the transformational change that IT can create. Considering that HE context limits the ability of TL to create an innovative environment for IT, we must seek out another concept that mediates the relationship. IT-enabled change and improvements require extensive coordination and collaboration at all levels of the organization, which both necessitates and engenders senior executive support from non-IT management (Campbell, Kay, & Avison, 2005). IT units in the HE context can expect that their environments will only be transformative if the high-ranking members of both the academic and administrative sides of the institution support the innovative efforts. Additionally, IT must have collaborative and synergistic (Nevo & Wade, 2010) relationships with partners throughout the institution. Consequently, we suggest the following propositions for future empirical studies to further explore this phenomenon (as illustrated in Figure 1):

**Figure 1: Proposed Relationships Between Transformational Leadership and Innovation in Higher Education Information Technology**
Proposition 1: The impact of TL on innovation in the HE context is mediated by the extent of collaborative relationships IT has with the rest of the institution.

Proposition 2: The impact of TL on innovation in the HE context is mediated by the amount of top management support IT receives, both from the academic and administrative segments of the institution.

Implications for TQM

Much of the focus of this article has been on collaboration in one form or another. The HE problems of the 21st century are too big for one person to solve alone. For nearly 30 years, TL has been identified as important for TQM success. In fact, it is an integral component of the Education Criteria of the Malcolm Baldrige National Quality Award (Akdere, 2015a) in terms of leading the quality management process for the purpose of achieving business excellence. The TQM process is a collective effort requiring effective action leading to both behavioral and cultural change on behalf of organizational members.

Zairi (1991) argued that TQM is a bottom-up activity enabled by modern leadership’s emphasis on participatory decision making and employee involvement. He further argued that charismatic leadership, the idealized influence and inspirational motivation dimensions of TL, is important for gaining commitment to TQM. Similarly, when analyzing a series of cases, Zairi (1994) identified several factors important for success in TQM implementation, including setting and communicating a vision, recognizing people as assets, developing a process-based culture, developing partnerships, and engaging in internal leader development. Setting and communicating a vision is a component of both charismatic leadership dimensions. Individualized consideration can only occur once people are recognized as valuable assets. Intellectual stimulation focuses on helping followers to constantly re-examine the methods and processes used at work (Bass & Avolio, 1990), asking them to focus on the means used to achieve ends. Inspirational motivation does not apply only to followers—TL leaders also develop partnerships to attain their visions of the future. And, finally, if TL can show the way to a more participative and process-oriented workplace, that will develop a pipeline of future leaders who follow those same behaviors.

IT leadership is directly involved in three of Deming’s 14 points for management. Instituting leadership can be accomplished from the IT perspective by the collaborative behaviors already identified as important. The goal of IT is to help people, machines, and processes in institutions to do better work. This is accomplished by automating processes, providing additional information for decision making, and creating better tools for connecting the people in and outside of HE institutions. A participative and collaborative set of IT leaders will, by forming a diverse set of relationships, help individuals understand how IT can help drive quality in their departments. TQM provides a systematic way for effective decision-making processes (Akdere, 2011) that are critical in IT operations.

Driving out fear and breaking down barriers are highly interrelated because they both rely on interdepartmental communication. Effective IT leadership must create synergistic relationships with non-IT units because IT’s functions directly impact all areas except for IT. The only way that IT is affected by its work is through the skills and expertise required to develop and maintain solutions. The solutions change the relationship the HE institution’s stakeholders have with IT. Specifically, IT changes the way employees work, suppliers coordinate with IT, and how students apply for and study at an HE institution. Learning-management systems are nearly universal, demand for online courses and degrees continues to increase, and most students manage their administrative relationships (e.g., tuition payments, class scheduling, and transcript requests) with the university through online systems. Breaking down barriers is necessary to drive out fear, and the IT units in universities are uniquely positioned to accomplish these changes. Figure 2 depicts the relationships to Deming’s points for management.

Conclusions and Future Research

IT leadership, especially that which fits the mold of TL, is uniquely positioned to help HE improve quality. The distinct position of the IT function provides the cross-departmental vision that is difficult to find elsewhere. HE institutions should...
ensure that IT leadership is involved in designing and implementing quality initiatives. Researchers should examine the impact of effective leadership not just of whoever is managing the initiatives, but they must also investigate how leadership from key IT employees can help those initiatives succeed.

Future research should examine the impact that TL leadership within IT has on HE TQM efforts. Specifically, cross-sectional data should be collected to examine whether TL’s relationship to innovation is mediated by the extent of collaborative relationships between IT and the rest of the university and the amount of top-management support IT receives. Many of the necessary leadership behaviors identified as important for TQM may be fulfilled by transformational IT leaders, so IT leadership may be able to help with quality efforts, even if innovation is inhibited by HE culture.

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Beginning in 2013, the Quality Approaches in Education editors will announce an annual best paper award to the author(s) of a paper published in Quality Approaches in Education. The award will be announced in January of each year for the best paper from the issues of the previous year and will be based on the largest single contribution made to the development or application of quality approaches in education. There is no nomination form for this award.

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Education Division
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Collaborative Initiatives in Higher Education: A Case Study of Economics Programs

Casey Abington

Abstract

The proportion of higher education funding in the United States provided by state govern-
ments has been shrinking since the Great Recession when states were forced to make large
cuts. In Missouri, tuition freezes were imposed along with a decrease in appropriations.
Consequently, universities had to find creative ways to increase revenues while lowering
costs. One such strategy was forming the Missouri Alliance for Collaborative Education
(MACE), where universities collaborate through shared faculty resources. Participating
universities offer different upper-level electives in which students at each university are
able to enroll. The primary goal of the alliance is to reduce resources required to offer
specific, low-enrollment majors. This article provides an overview of the MACE initiative
in economics. First, the need for the collaboration is discussed. Next, the design and imple-
mentation of the program is explained. Finally, the benefits and challenges are explored
along with results and conclusions.

Keywords

Higher Education, State Appropriations, Collaboration

Introduction

The Great Recession had a dramatic impact on the budgets of state governments. Tax
revenue plummeted while the need for public welfare spiked. Although federal relief from
the American Recovery and Reinvestment Act (ARRA) of 2009 helped offset some effects,
states still struggled to balance budgets. As a result, state governments were forced to
reduce spending to compensate for the lost revenues (Gordon, 2012). In most states, higher
education funding was one area that suffered large cuts. For example, Arizona and Illinois
have both cut higher education spending by more than half, with decreases of 55.6% and
54.0%, respectively, since 2008 (Mitchell, Leachman, and Masterson, 2016).

Prior to the recession, state funding for higher education was steadily growing. Figure 1
shows total state support for higher education across the United States from 2007 to 2017.
It shows a clear upward trend followed by a considerable decline during the recession.
Thirty-eight states spent more on higher education for the 2015-2016 school year than in
the previous year (Mitchell et al., 2016).

According to a report published by the State Higher Education Executive Officers
Association (SHEEO), state and local spending per student from 2010 to 2012 was the
lowest in the past 25 years (SHEEO, 2015). More recently, state support for higher educa-
tion has started to rebound, yet all states except four (Montana, North Dakota, Wisconsin,
and Wyoming) are still spending less than before the recession (Mitchell et al., 2016).

Before the Great Recession, states provided more than 60% of funding for public
higher education, while 35% came from tuition revenue, and the remaining 5% from
local sources. By the end of the recession, however, the proportion of funding from states
dropped to 50%, and the amount from tuition revenue climbed to 45% (SHEEO, 2015).
With declining funding, institutions were forced to reduce spending, raise tuition, or find
new sources of revenue. The severity of funding cuts differed across states and universities,
as did the responses. Some eliminated programs or courses, hiked tuition, created fees, laid
Missouri, like other states, experienced a large decrease in state funding during the recession. Unlike the national average, however, Missouri state appropriations have remained essentially flat since and are still well below pre-recession levels as shown in Figure 2. In addition to the severe funding cuts resulting from the recession, four-year public universities in Missouri faced an additional budget hurdle. With a goal of keeping college education affordable, the state government imposed tuition freezes for fiscal years 2010 and 2011, and has since allowed tuition hikes only as large as the increase in consumer price index (Hunn, 2009; MDHE, 2017). This was not common across states as many institutions compensated for the loss of funding by simply raising tuition and fees. Without the ability to increase revenues through tuition, public universities in Missouri were forced to find more creative solutions. During the 2010 Higher Education Summit, Missouri Governor Jay Nixon stated that there must be fundamental changes in higher education. He asked universities to focus on four areas: attainment, academic program review, cooperation and collaboration, and funding (Nixon, 2010). Soon after his speech, the Missouri Alliance for Collaborative Education (MACE) program was proposed. The next section describes the MACE initiative. Details of the MACE program in economics programs are then provided. The benefits and challenges of the MACE program are discussed and results thus far are summarized. Finally, conclusions and future work are presented.

**MACE Initiative**

The MACE program was developed in 2010 as a direct response to the recession-induced decline in funding for higher education in Missouri. Reduced state funding, combined with tuition freezes, required Missouri universities to find ways to utilize their resources more efficiently. The MACE program aligned with the governor’s third focus area—cooperation and collaboration. The initiative was designed for programs with low enrollment or limited resources. The goal was to protect these programs from elimination as universities faced tight budgets. The basic premise of the MACE program is collaboration among several universities by sharing faculty resources for specific majors. Each participating university offers different upper-level major courses rather than each university offering all electives. Students complete their major by taking most courses through their (“home”) university along with some upper-level electives taught online through the partner (“provider”) schools.

While the MACE initiative was developed for several disciplines, the focus of this article is on the economics program collaboration between three universities, which include Northwest Missouri State University (NWMSU), Southeast Missouri State University (SEMO), and University of Central Missouri (UCM). The purpose of this collaboration, which was implemented in the fall of 2011, is twofold. First, it preserves the economics programs at the three universities by reducing required resources. Second, it enhances the economics course
offerings for each university by facilitating access to additional faculty with different areas of expertise.

The MACE Initiative in Economics

Participating Universities

All three participating schools are four-year public universities located in different areas of Missouri. Total enrollment at NWMSU, SEMO, and UCM is 7,000, 11,000, and 14,000 students, respectively. The undergraduate student characteristics at each school are similar. The majority of students are comprised of Missouri residents, and the percentages of minority and international students are comparable. University-wide average ACT scores range from 21.8 to 23 for the three universities (NWMSU, 2017; SEMO, 2017; UCM, 2017).

Courses

Introductory and intermediate courses in macroeconomics and microeconomics continue to be taught on each campus and are not part of the collaboration. These courses tend to have sufficient enrollment as they are required for other majors. Therefore, only upper-level economics electives are part of the MACE program. The six courses included in the collaboration are Labor Economics; Money, Credit, and Banking; International Economics; Comparative Economics; Sports Economics; and Econometrics. Each university is responsible for teaching two specific MACE courses—one per semester.

Tuition

Students enroll in MACE courses through their home university. Tuition dollars stay with the home university, regardless of which school is responsible for teaching the course. For example, UCM teaches the MACE Econometrics course. If a student from NWMSU wants to take Econometrics, they enroll in the course through NWMSU just as they do any other course taken at the university.

Enrollment Process

Students are not required to transfer any courses between universities. As previously mentioned, students enroll in MACE courses through their home universities. However, enrolling in the course is just the beginning of what can be a complicated process.

Prior to the start of the semester, the appropriate contact (director or chair) at each home university sends the rosters of students enrolled in MACE courses to the provider universities. Each provider institution must then ensure that the students from the partner universities are properly enrolled into the MACE courses and have access to the necessary online course sites. The process is complex because the students are not paying tuition to and are, therefore, not officially students at the provider university. This creates some challenges regarding enrollment, registration, communication, and course-site access. Along with the instructors and program contacts, the universities’ respective registrars and information technology departments must be involved in the solutions to these issues.

Access to Online Course Sites

All MACE courses are delivered online; therefore, students must have access to the provider university’s course site. Enrolling a student in a course site is a separate process from enrolling the student in the course and differs across universities.

Each participating university uses a different learning (course) management system to facilitate its online courses. As such, students must learn and adjust to using the provider institution’s system. It is the responsibility of the provider university to deliver the necessary login information and instructions to the MACE students.

Course Content, Design, and Grades

Each provider institution is responsible for creating and delivering the MACE courses it teaches. There are currently no MACE guidelines for courses and, therefore, no uniformity. While course syllabi are provided to participating universities for each MACE course, instructors have full control over required textbooks and materials, content, structure, assessment, and grades. Once course grades are assigned, the provider institution’s instructor emails the grades to the appropriate contact at the students’ home universities.

Number of Students

When the MACE program for economics was created, the three universities made an informal agreement that enrollment for each university in each MACE course would be capped at 10 students. Under that agreement, the maximum number of MACE students in a course would be 20. These potential 20 students would be in addition to the regular, home enrollment in the course. The provider university decides how strictly to enforce the cap.

Three MACE courses are offered each semester—one per university. Figure 3 shows the total number of students from each home university enrolled in courses taught by provider universities. The figure shows some instances where the enrollment caps of 10 students were not strictly enforced. It is also clear that enrollment imbalances exist across universities. In every semester except one, the number of SEMO and UCM students taught by NWMSU was greater than the number of NWMSU students
taught by those schools. These imbalances mostly reflect the size differences of the universities as well as the number of economics majors at each. NWMSU is significantly smaller in both aspects.

When discussing enrollments in MACE courses, it is important to remember that tuition dollars stay with the home university, not the provider university. NWMSU is at a disadvantage when comparing the number of additional students taught versus the number of tuition dollars received. UCM is at an advantage as they are larger and have more than double the number of economics majors. Figure 4 illustrates the number of economics majors at each university throughout the past ten years.

**Benefits of the MACE Program**

**Preserve economics programs**

The most significant benefit of the MACE initiative is that it has allowed all three participating universities to keep, and even grow, their economics programs (Figure 4). This might have been impossible without the collaboration. Prior to the formation of the MACE program, the economics majors at all three universities were identified as “low-enrollment,” and eliminating low-enrollment programs was one option to reduce costs as each university faced large funding cuts during the recession.

**Increased variety of course offerings**

The collaboration enables each university to offer an increased variety of courses. University course offerings are limited by the number and expertise of faculty. The MACE program gives each participating university access to additional faculty with different areas of specialization, allowing the universities to offer a larger number and wider variety of economics electives. For example, the collaboration has enabled all three universities to offer a Sports Economics course, which was not possible before.

**Cost savings**

The MACE program reduces the number of upper-level economics electives that each school must offer. With four electives taught by other universities, fewer faculty resources are needed for each economics program. For example, NWMSU requires one less full-time economics faculty member than before the collaboration because fewer courses must be taught for the degree.

**Connections and networking**

Both students and faculty can benefit from interactions with students and faculty at other universities. Students interact and learn from each other during the courses through online class discussions and other assignments. Students from other universities bring different perspectives and ideas because they have taken courses from different professors and, therefore, have different knowledge. The students also have varying jobs, internships, and contacts, all of which are often discussed in courses. This exposure presents additional networking opportunities that could open paths to internships and careers.
Additionally, students benefit by having access to additional faculty resources at two other universities. This not only gives students additional resources for new knowledge but also for references, recommendations, internships, and job opportunities.

Finally, faculty can also gain from having contacts at other universities. These connections can translate into research collaborations, jobs, and other professional opportunities.

**Demonstrates willingness to change**

As mentioned previously, Missouri’s government encouraged cooperation and collaboration. Participation in the MACE program shows that the universities are willing to change, adapt, and take part in reducing costs and operating efficiently through collaborations.

**Challenges of the MACE Program**

**Larger class sizes**

The MACE program leads to larger enrollment in the collaborative courses. This is not problematic if the course originally had low enrollment. However, if there was healthy enrollment before the collaboration, adding the MACE students can make class sizes quite large. Each university has its own enrollment caps for courses, and the additional MACE students are generally not included in these caps. Therefore, MACE courses can have enrollment levels beyond a university’s typical maximum. There have been instances where the collaboration has pushed enrollment to 55 students or more. Figure 5 shows total enrollment levels in MACE courses taught by NWMSU and the breakdown of how many of these students are from NWMSU versus how many are enrolled at the other universities.

The number of students in a course impacts how that course is designed and taught. Large classes simply cannot be taught or structured in the same way as small classes. For example, it becomes necessary to rely more on multiple choice rather than short-answer or essay questions for assessments. For example, essay and short-answer questions, written assignments, term papers, and projects are less likely to be assigned to large classes because of the time required for grading. The larger the class, the more difficult it is to provide meaningful, personal feedback to each student. While more students can have a positive impact on class discussions through additional ideas and perspectives, there are still negative effects on discussions. The sheer number of posts becomes an issue. It is difficult for students to read every single post, and it becomes time-consuming for the instructor to respond to each one. In smaller classes, it is easier to carry on a meaningful discussion because the students and the instructor can read and respond to all posts.

**Confusion for students**

There are many potential sources of confusion for students in MACE courses. First, they often do not know about or understand the collaboration. They may be confused as to why they are taking a course taught by a professor at another university. In general, improvement is needed in explaining and promoting the program to students.

The process of enrolling in and taking a MACE course can be confusing. Prior to the start of the course, students receive multiple emails from various people about registration, the course site, and the course itself. Much of this communication occurs well before the beginning of the semester—either during summer or winter break. Some students do not check email regularly during breaks and therefore might miss this important information. That aside, even if all emails are read, the communication and information often are from people who the students do not know and from a university other than their own.
Lack of consistency and control

As mentioned previously, there are no guidelines for designing and teaching MACE courses. Therefore, they have different syllabi, requirements, and structures. Students must learn how to navigate and use a new learning management system when taking a course offered by another university.

There has not been any formal review of MACE courses by the participating universities. Each institution is responsible for ensuring that the courses offered are of high quality. Therefore, each university must trust that other universities and professors are giving the students a good experience and equipping them with the appropriate knowledge and skills.

Logistics

The MACE program requires additional effort from instructors, department chairs or directors, registrars, and technical support staff. A significant amount of time is spent responding to questions, concerns, and issues that arise as a result of the collaboration.

A major logistical issue is that the participating universities operate on different academic calendars. They have differing semester start dates, finals dates, days off, and holiday breaks. The MACE courses always follow the provider university’s schedule. Therefore, it is often necessary to accommodate students who are on different schedules and provide some flexibility, especially during the first week of class as students are still in transition. It is particularly challenging for students when a MACE course starts earlier than their other classes.

Grade submission is also affected by the differing academic calendars. Recall that the provider institution assigns student grades, but the home institution is responsible for submitting official grades. It is possible that the home institution’s semester ends before the provider institution. When this occurs, the home university must enter an incomplete or in-process grade and then submit a grade change once the grades are received from the provider institution. While this does require additional administrative work, the students should not be negatively affected because only the final grade is reported.

As discussed previously, registering and granting access to the online course sites for students from other universities is a complicated process. The chair or director, registrar, technical support, and instructor must work together to determine the best method. Some questions to address include the following:

- Should the students be fully enrolled in the provider university?
- What information does enrollment require?
- Are students assigned IDs and email addresses for the provider institution?
- What is the timeline for the registration process and who is responsible for each step?
- Who communicates with the students; and when and what do they communicate?

Each university has developed answers to these questions.

Caps on enrollment

The MACE program agreement suggested a cap of 10 students per university per course. At times, 10 is not sufficient to meet enrollment demand. For example, NWMSU must offer its own section of International Economics on campus because there are not enough seats available in the MACE course taught by the provider institution. This clearly makes the collaboration less beneficial in terms of saving faculty resources as the course must be taught on campus anyway.

Tuition dollars and compensation

Students enrolled in MACE courses pay tuition to their home universities. It was shown previously that NWMSU, the smallest school, has the fewest students enrolled in MACE courses. Therefore, NWMSU is teaching more students, yet receiving fewer tuition dollars than the other universities. It should also be noted that instructors teaching MACE courses are not given additional compensation for the larger class sizes. Overall, the collaboration appears to be more advantageous for larger universities.

Delivery

MACE courses are offered online only. This type of course is a benefit for some students as it provides flexibility. However, some students prefer or perform better in a face-to-face environment. Students have no choice but to take some of their upper-level economics electives online. Economics is difficult for many students, and is often more challenging when taught online.

Results

It is difficult to say with certainty yet whether or not the MACE program has been successful. How should success be calculated? Is it measured by reduced costs, increased revenues, higher enrollment in economics courses, more economics majors, improved graduation rates, or something else?

In terms of reducing costs, the MACE initiative has been successful. Each university can offer its economics major with fewer required resources. For example, the collaboration saves NWMSU the equivalent of a full-time economics faculty salary each year.

In regard to enrollment, the results from the three universities have been mixed. Figure 4 shows the number of declared
economics majors at each university throughout the past 10 years. From 2004 to 2010, the number at each university remained relatively constant. Then all three universities saw an increase in majors between 2010 to the fall of 2011, when the MACE program began. After 2011, trends differed for the participating schools. NWMSU has seen a small, yet steady increase in economics majors each year from 2010 to 2015. After a big increase from 2009 to 2011, SEMO had a steady decline in majors each year from 2012 to 2014, but rebounded with a significant increase in the 2015 academic year. UCM has experienced the largest change in majors, more than doubling from 2010 to 2012. Much of this increase is attributable to the creation of the Business Economics major in 2012. Overall, two out of the three participating schools have reported increases in the number of economics majors since the start of the MACE program. It is also important to note that total undergraduate enrollment at the three universities has not changed significantly in the past five years. Based solely on this data, it is difficult to draw any firm conclusions regarding the impact of MACE and economics enrollments. Yet, Figures 4 and 5 still provide important information regarding trends.

One way to measure the effectiveness of courses in general is through student evaluations. Currently, the provider institution and instructor do not receive evaluations from MACE students. The universities are missing an opportunity to collect additional feedback that could be used to improve the courses and the collaboration.

Furthermore, the three participating universities have not met to review the program since the collaboration began. It would be beneficial to discuss the experiences of each university and work together to improve the program.

**Conclusions, Recommendations, and Future Research**

The MACE program was designed to save lower-enrollment majors that could face potential elimination by reducing expenses when state funding was decreased during the recession. The MACE program decreases the cost of these majors by sharing faculty resources across universities.

The MACE initiative for economics includes three universities for which the economics degree programs were considered to be low-enrollment. Each participating university offers two different upper-level economics elective courses for which students from all three universities are able to enroll.

Participating institutions and students benefit from the MACE program in a variety of ways. First, the collaboration lowers the number of economics courses that each institution must offer, thereby reducing required resources. Universities are also able to offer a greater variety of economics electives with access to additional faculty. Another benefit is the opportunities for additional networking—student to student, student to faculty, and faculty to faculty. Finally, participating in the collaboration shows state government that universities are willing to adapt and operate more efficiently.

The MACE program also comes with challenges. The most common issues that arise are logistical and can create confusion for the students. Students enroll through their home universities and pay tuition to their own school, but the course is taught online by another university. The MACE courses are not standardized—each instructor creates his or her own syllabi and course structure. Furthermore, each university operates on its own calendar and uses a different learning (course) management system. Another issue is that the participating universities differ in size, causing an imbalance in the number of additional students taught. The smaller universities are teaching more additional students, but are not receiving the added tuition. Finally, MACE courses are only offered online. Online delivery and learning can be difficult for upper-level economics courses, which often involve complex theory and mathematics.

All three universities have been able to continue offering economics majors since the MACE was formed. In that sense, the collaboration has certainly been successful. Also, the challenges of the program have become easier to handle over time with experience. This article provides an overview of the MACE program in economics and describes some of the benefits and challenges. However, this summary is not sufficient for determining whether the program is truly beneficial for each university or sustainable going forward. A more detailed analysis of each university’s experience is needed to answer these questions. The analysis should include a thorough cost-benefit comparison for each economics program, an examination of enrollments and resources, along with feedback from students, instructors, and chairs or directors.

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- Case studies demonstrating best practices and systems thinking in education using the *Baldrige Education Criteria for Performance Excellence*, Lean Six Sigma or other national quality models, standards from the Council for the Advancement of Standards in Higher Education (CAS), or national frameworks and protocols, including preparing K-16 teachers for teaching in the 21st century learning environment.
- Case studies or research studies on scholarship of teaching and approaches to improve teaching, enhancing and supporting student learning, learning outcomes assessment best practices, and best practices for using technology in the classroom.
- Case studies or research studies on how student service units and intervention programs impact the quality of student experience and student learning.
- Case studies or research studies specific to collaboration with industry on STEM education through internships, co-ops, and capstone experiences for providing experiential and deep learning experiences and preparing students for STEM careers.
- Research studies on how education practices impact the quality of student life and student success for different student populations, including underrepresented groups, first generation in college students, and students from low-income families.
- Case studies that highlight the emerging improvement science for education and the continuous improvement cycle.
- Significant conceptual articles discussing theories, models, and/or best practices related to quality in higher education, K-12, and workforce development.

NOTE: We may dedicate an issue to a special topic to highlight areas of high interest in the field of education.

Articles generally should contain between 3,500 and 5,000 words and can include up to six charts, tables, diagrams, illustrations, or photos of high resolution. For details, please check the “Author Guidelines” at: [http://asq.org/edu/quality-information/journals/](http://asq.org/edu/quality-information/journals/)

Please send your submissions to:
Dr. Elizabeth Cudney at QAEJournal@gmail.com
Quality Approaches in Education is a double-blind, peer-reviewed journal that is published online by the Education Division of the American Society for Quality (ASQ). The purpose of this journal is to engage the education community in a discussion of significant topics related to improving quality and identifying best practices in education as well as expanding the literature specific to quality in education topics. We will only consider articles that have not been published previously and currently are not under consideration for publication elsewhere.

General Information

Articles in Quality Approaches in Education generally should contain between 3,500 and 5,000 words and can include up to six charts, tables, diagrams, photos, or other illustrations. See the “Submission Format” section for more detail.

The following types of articles fit the purview of Quality Approaches in Education:

- Case studies on how to improve quality in a college, school system, or workforce development program using evidence-based analysis and continuous improvement approaches, especially related to improving student retention and degree completion.
- Research articles reporting on survey findings such as a national survey on students’ attitudes toward confidence, success, social networking, student engagement, access and affordability, etc.
- Case studies or research articles addressing issues such as the role of faculty, administrators, and trainers in quality systems.
- Case studies or research studies focusing on the role of quality in accreditation.
- Case studies demonstrating best practices and systems thinking in education using the Baldrige Education Criteria for Performance Excellence, Lean Six Sigma or other national quality models, standards from the Council for the Advancement of Standards in Higher Education (CAS), or national frameworks and protocols, including preparing K-16 teachers for teaching in the 21st century learning environment.
- Case studies or research studies on scholarship of teaching and approaches to improve teaching, enhancing and supporting student learning, learning outcomes assessment best practices, and best practices for using technology in the classroom.
- Case studies or research studies on how student service units and intervention programs impact the quality of student experience and student learning.
- Case studies or research studies specific to collaboration with industry on STEM education through internships, co-ops, and capstone experiences for providing experiential and deep learning experiences and preparing students for STEM careers.
- Research studies on how education practices impact the quality of student life and student success for different student populations, including underrepresented groups, first generation in college students, and students from low-income families.
- Case studies that highlight the emerging improvement science for education and the continuous improvement cycle.
- Significant conceptual articles discussing theories, models, and/or best practices related to quality in higher education, K-12, and workforce development.
**Manuscript Review Process**

We log all article submissions into a database and delete all references to you. These “blinded” versions then go to the editorial review team for comments and recommendations. Both author(s) and reviewers remain anonymous in this process. The review process takes approximately three months during which time the reviewers advise the editor regarding the manuscript’s suitability for the audience and/or make suggestions for improving the manuscript. Reviewers consider the following attributes:

1. **Contribution to knowledge:** Does the article present innovative or original ideas, concepts, or results that make a significant contribution to knowledge in the field of quality in education?
2. **Significance to practitioners:** Do the reported results have practical significance? Are they presented clearly in a fashion that will be understood and meaningful to the readers?
3. **Conceptual rigor:** Is the conceptual basis of the article (literature review, logical reasoning, hypothesis development, etc.) adequate?
4. **Methodological rigor:** Is the research methodology (research design, qualitative or quantitative, methods, survey methodology, limitations, etc.) appropriate and applied correctly? For a conceptual paper, is the framework appropriate and applied correctly?
5. **Conclusions and recommendations:** When appropriate, are the conclusions and recommendations for further research insightful, logical, and consistent with the research results?
6. **Readability and clarity:** Is the article well organized and presented in a clear and readable fashion? Is the article written in English and in a grammatically acceptable manner?
7. **Figures and tables:** When submitted, are the figures and/or tables used appropriately to enhance the ability of the article to summarize information and to communicate methods, results, and conclusions?
8. **Organization and style:** Is the content of the article logically organized? Are technical materials (survey scales, extensive calculations, etc.) placed appropriately? Is the title representative of the article’s content?
9. **Attributions:** Are the sources cited properly using APA style? Are attributions indicated properly in the reference list?

You should use these attributes as a checklist when reviewing your manuscript prior to submission; this will improve its likelihood of acceptance.

**Review Process Outcomes**

There are three possible outcomes of the review process:

- **Accept with standard editorial revisions.** In this case, the content of the article is accepted without requiring any changes by you. As always, however, we reserve the right to edit the article for style.
- **Accept with author revisions.** An article in this category is suitable for publication, but first requires changes by you, such as editing it to fit our length requirements or providing more detail for a section. We provide specific feedback from our reviewers to guide the revision process.
- **Decline to publish.** Occasionally articles are submitted that do not fit our editorial scope. We may provide you with suggestions for modifying the article to make it more appropriate to our publication.

Please note that after articles are edited for publication, we return them to you to approve the technical content. A response may be required within 48 hours or the article may be held over for a subsequent issue.

Articles that appear to be advertising or do not fit the general topics addressed by *Quality Approaches in Education* will be rejected without receiving peer reviews.
1. Articles should emphasize application and implications of what is being presented, whether conceptual or research-based.
   - Use the early paragraphs to summarize the significance of the research.
   - Make the opening interesting; use the opening and/or background to answer the “so what?” question.
   - Spell out the practical implications for those involved in education.

2. Detailed technical description of the research methods or conceptual/theoretical framework is important, but not necessarily of interest to everyone. The description should enhance the narrative or be critical to the understanding of the article’s material.

3. Throughout the article, keep sentence structure and word choice clear and direct.

4. Avoid acronyms and jargon that are industry- or organization-specific. Try not to use variable names and other abbreviations that are specific to the research. Restrict the use of acronyms to those that most readers recognize. When acronyms are used, spell them out the first time they are used and indicate the acronym in parentheses.

5. Occasionally, our reviewers and readers view articles that include reference to the author(s) proprietary products or methods as a form of advertising. Although we encourage you to share personally developed theories and application approaches, we ask that you refrain from using our publication as a marketing tool. Please take great care when including information of this nature in your article.

6. If the article cites cost savings, cost avoidance, or cost-benefit ratios, or provides the results of statistical evaluations, include an explanation of the method of calculation, along with any underlying assumptions and/or analysis considerations.

7. Access to any survey discussed in the manuscript is important for our review and must be included with the manuscript. Depending on the length of the survey, we may include the entire survey with the article.

8. When submitting an article that is based on qualitative methodology, please be sure to describe the research questions, the information that is the basis of the data analysis, and report the developing themes. Also remember to include text analysis as part of data analysis. Please include the protocols in a separate Word document; review of the protocols will be important in our technical review. Consider including the protocols in the methodology section of the manuscript, if they can be presented concisely.

9. Our staff does not have the means to compile references or verify usage permissions; therefore, it is important for you to provide all that information with your article, including written letters of authorization when appropriate. Plagiarism is a rapidly growing crime—particularly due to the use of information from the Internet. Please help yourself, and us, to maintain professional integrity by investing the time necessary to verify your sources and to obtain and document all necessary permissions. Information on our requirements for documenting references, along with specific examples, is included at the end of these guidelines.
Submission Format

1. We accept only electronic submissions in Microsoft Word format. The first page should be a title page with the title, names of the authors, and their affiliations. The second page should be the start of the proposed article with the title and abstract (150 words maximum) at the top of the page. There should be no reference to the author(s) or affiliation in the text that follows. Instead of the name of a university for a case study, the text should state “the University”. The margins should be one inch all around on 8½ x 11 pages with Word’s one-column format, left-justified. The title and section titles should be 14-point bold Calibri font. The text font should use 11-point Calibri font and a line spacing of 1.5 is preferred.

Section headings should be 12-point bold Calibri and left justified. Typical section names are: Abstract, Introduction, Background, Literature Review, Methodology, Results, Discussion, Suggestions for Best Practices, Summary or Conclusions, Recommendations, Future Work/Research, Acknowledgments, and References. The actual headings will depend on the focus of the manuscript. There may be two additional levels of sub-headings. The first set of subheadings would be left-justified with the first letter of each word capitalized and in bold, 12-point Calibri. The second level of sub-headings would be the same but in italics.

2. If you are familiar with the APA formatting, we prefer the APA format, but will accept a well-formatted manuscript following these already mentioned guidelines.

3. The manuscript should be between 3,500 and 5,000 words including the abstract, tables, and references. It should include no more than six tables or figures. If you feel strongly that more tables or figures are needed to support the manuscript, we ask that you submit the additional tables orfigures and provide an explanation for including them.

4. Tables should be included at the end of the article and must be in Microsoft Word. Each table must be referenced in the article and labeled and centered on a separate line, such as <Insert Table 1 About Here> with the caption for Table 1 on the next line, such as Table 1: Graduation Rate by Major. Do not embed .jpg, .tif, .gif, or tables in other similar formats in your article.

5. Drawings, graphs, and other illustrations should be sent in an email as separate .jpg files with 300dpi; each item should be included in a separate file. All drawings and other illustrations must be referenced in the article, and must be labeled and centered on a separate line, such as <Insert Figure 1 About Here> with the caption for Figure 1 on the next line: “Figure 1: Pareto Analysis of Student Participation in Department Activities.”

6. We can use photos if they enhance the article’s content. If you choose to submit a photo with your article, it must be a high-resolution .jpg or (at least 300 dpi and at least 4” by 6” in size). Photos should be sent in separate files and referenced in the article. Photos should be accompanied by a complete caption, including a left-to-right listing of people appearing in the photo, when applicable. Do not include any text with the photo file. All persons in the photo must have given permission to have their photo published in Quality Approaches in Education.

7. Also submit a separate high-resolution electronic photo (at least 300 dpi) for each author. Author photos should be at least 1” by 2”. Author photos should have a plain background, and the author should be facing toward the camera. Please include a separate Word document with a 75- to 100-word biography for each of the authors, mentioning the place of employment, as well as contact information.
Citations and References

Quality Approaches in Education follows the 6th edition of the Publication Manual of the American Psychological Association. Citations and references should use the (author’s last name, year of publication) notation in a citation in the text and use the APA style.

The reference section should be headed with the section heading of “References” and all references are to be listed alphabetically by the first author’s last name. Each reference should list all authors. List the online URL with a hyperlink. Retrieved date is not needed. Here are some examples:

**Book examples:**

**Journal article examples:**

**Reference example:**

If the authors cite their own work, they should simply state (Author, year) and the same in the reference list (no title) in the initial manuscript (since the reviews are double-blind).

One of the most common errors we have observed with submitted articles is improper referencing due to improper attribution in the text and reference section. Please make sure that all the material in the submitted article is properly referenced and cited as appropriate.

Submission

Send an electronic copy of the Word document of the manuscript including the title page, abstract, text of the manuscript, acknowledgments, and references, with a separate file of any surveys used, separate .jpg files of the figures and photos of authors, and a Word document of the author biographies to Dr. Elizabeth Cudney at QAEJournal@gmail.com.

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Prior to publication, you must sign a form affirming your work is original and is not an infringement of an existing copyright. Additionally, we ask you to transfer copyright to ASQ. The copyright transfer allows you to reproduce your article in specific ways, provided you request permission from ASQ and credit the copyright to ASQ. The transfer also allows ASQ to reproduce the work in other publications, on its website, etc.

If you use materials from other works in your articles (other than standard references), you must obtain written permission from the copyright owner (usually the publisher) to reprint each item of borrowed material. This includes any illustrations, tables, or substantial extracts (direct quotations) outside the realm of fair use. Submit these permission letters with the article. Articles cannot be published until copies of all permission letters are received.

For example, an article includes a PDSA illustration from a book. The permission statement would include: Figure 1 is from Nancy R. Tague’s *The Quality Toolbox*, 2nd ed., ASQ Quality Press, 2005, page 391. This permission statement would appear in the caption just below the PDSA figure.