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Management information systems: using a simulated testing package to assess student performance

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ABSTRACT

This paper describes the results of using a simulated testing package to assess student performance in an advanced computer applications course. A pre-test/post-test format was utilized in assessing whether the level of knowledge and skills attained by students who completed the advanced course increased significantly when compared to the knowledge and skills the students possessed when entering the course. SAM, a student assessment tool that uses a simulated environment for testing, was used to measure each student's level of knowledge and expertise both at the beginning of the course and at the conclusion of the course. The comprehensive final exam used by the Management Information Systems Department for the advanced applications course was used as the post-test. This same exam was given at the beginning of the semester as the pre-test.

When a statistical analysis was performed on the scores, the Department found that the pre-/post-test process was not only useful in providing a measure of the learning that took place, but also in providing evidence that the intended outcomes of the technology component of the business core were achieved. The pre-/post-test process thus serves as an effective assessment tool, which is critical for both HLC (Higher Learning Commission) accreditation and AACSB accreditation.

Keywords: Assessment, Pre/Post-testing, Accreditation, IS Assessment, SAM

INTRODUCTION

According to AACSB, "measures of learning can assure external constituents such as potential students, trustees, public officials, supporters, and accreditors, that the organization meets its goals" (AACSB 2007, p. 60). In recent years, there has been a strong emphasis at the university involved in this study on providing course level assessments for accreditation purposes. Although the AACSB standards focus on program level assessment, the AACSB organization recognizes the need for course-level assessments. According to an interpretation of the AACSB standards, "course-level assessments are each faculty member's responsibility" (AACSB Assurance of Learning, 2007, p. 4).

Schuh noted that the emphasis on technology in schools in recent years has changed from providing students with "access to technology to giving them the skills they need to live, work, and learn in an increasingly digital world" (Schuh, 2004, p. 1). MIS 205, Advanced Computer

Applications, is a core course required of all business majors at the university described in this study. The course is designed to provide business students with the skills needed to survive in this increasingly digital world.

A central theme in HLC accreditation is the focus on commitment to student learning and the meaningful use of assessment to confirm and improve student learning (HLC, 2007). Prior to the Spring 2007 semester, a general content multiple choice exam had been used to assess whether learning did in fact take place in the advanced applications course. The MIS Department found that the post-test scores were useful in providing a measure of the level of learning that took place and evidence that the intended outcomes of the technology component of the business core were achieved (Paranto & Neumann, 2006). However, the exam included general computer knowledge that all college graduates should possess rather than content that was specific to this particular class. The multiple choice exam provided statistical data to indicate that students scored significantly higher at the conclusion of the class than they did at the beginning of the course, but the MIS faculty felt it would be advantageous to have an exam that covered the specific topic areas and skills taught in the advanced applications course.

The MIS department started the process by meeting to discuss which skills were of utmost importance for business students, in order to update the final exam such that the key concepts and skills were included in the comprehensive final. Once this determination was made, SAM, a student assessment tool that uses a simulated environment for testing, was used to develop the exam. SAM is a Web-based "Skills Assessment Manager" software application that measures users' proficiency in the Microsoft Office applications suite (Access, Excel, PowerPoint and Word), the Windows operating system, and general Internet skills (SAM, 2008). All faculty in the department had an opportunity to recommend changes to the draft exam that was developed and when the final version was ready to go, the pre/post-test process was revised to utilize the SAM package, beginning in the Spring 2007 semester.

METHODOLOGY

The pool of students used to assess learning in the advanced computer applications course (MIS 205) was taken from the Spring and Fall 2007 semesters. There were three sections of seventy (70) students in the Spring semester, all taught by the same instructor. In the Fall, there were three sections of sixty one (61) students taught by two different instructors.

At the beginning of the semester each student took an in-class pre-test over the specific material to be covered in each section of the course. Subsequently each student took a post-test over the same material. This post-test was the comprehensive final used in the advanced applications course. The pre- and post-tests were identical. A statistical analysis was conducted on the results. Faculty members were especially interested in comparing the statistical difference in the pre- and post-test results. We expected that students would achieve a statistically significant higher score on the post-test relative to the pre-test. An added benefit of the process is that the results provide assessment agencies with evidence of student learning.

STATISTICAL RESULTS

Sample Descriptive Statistics

Tables 1 through 3 report the descriptive statistics for our sample. Tables 1 and 2 present the summary statistics for the spring and fall semesters and Table 3 for the combined spring and fall sample. In the spring semester, the individual pre-test scores ranged from 5% to 55%, whereas the individual post-test scores ranged from 32.5% to 97.5%. In the fall, the individual pre-test scores ranged from 7.5% to 72.5%, whereas the individual post-test scores ranged from 40% to 97.5%. Each table also provides the sample mean, median, mode, and standard deviation for the particular semester. The post-test mean, median, and modes for each semester exceed the pre-test values. The standard deviations tend to be greater in the fall as compared to the spring. Thus the variation of scores appears to be greater in the fall semester.

Figures 1 and 2 consist of box plots for the spring and fall semester of 2007 which provide a unique picture of the data. Figure 3 is the box plot for the spring and fall semesters combined. The box plot clearly shows the post-test results exceed the pre-test scores for each semester and the spring and fall semesters combined.

Table 1
Spring 2007 Pre and Post-Test
Sample Descriptive Statistics

	Pre-Test	Post-Test
Sample size (n)	70	70
Mean	29.714	70.036
standard deviation	9.987	14.126
minimum	5.000	32.500
maximum	55.000	97.500
1st quartile	25.000	62.500
median	30.000	70.000
3rd quartile	35.000	79.375
mode	25.000	62.500

Figure 1
Spring 2007 Pre and Post Test
Box Plots

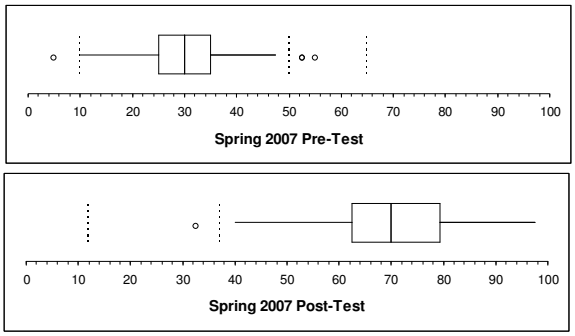


Table 2
Fall 2007 Pre and Post-Test
Sample Descriptive Statistics

	Pre-Test	Post-Test
Sample size (n)	61	61
Mean	30.861	69.713
standard deviation	12.415	14.362
minimum	7.500	40.000
maximum	72.500	97.500
1st quartile	25.000	57.500
median	32.500	67.500
3rd quartile	37.500	80.000
mode	35.000	67.500

Figure 2
Fall 2007 Pre and Post Test
Box Plots

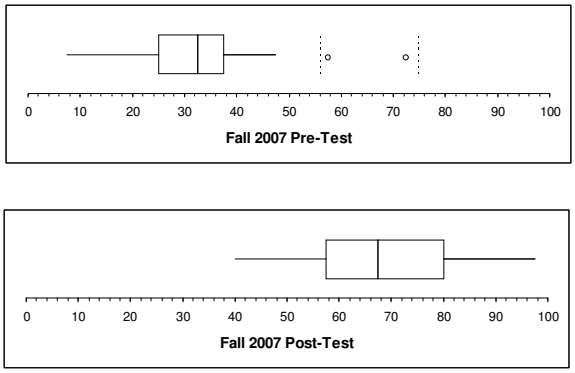
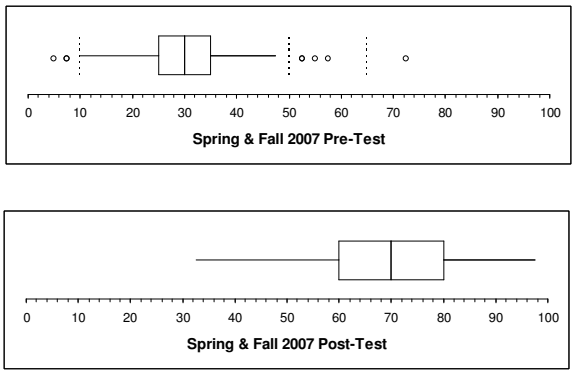


Table 3
Spring & Fall 2007 Pre and Post-Test
Sample Descriptive Statistics

	Pre-Test	Post-Test
Sample size (n)	131	131
Mean	30.248	69.886
standard deviation	11.154	14.182
minimum	5.000	32.5
maximum	72.500	97.500
1st quartile	25.000	60.000
median	30.000	70.000
3rd quartile	35.000	80.000
mode	25.000	67.500

Figure 3
Spring & Fall 2007 Pre and Post Test
Box Plots



Statistical tests of differences in the pre- and post-test means:

Tables 4 and 5 present the statistical results for the tests of differences in means. Table 4 provides the t-statistics for the spring and fall. Table 5 provides the t-test for the combined spring and fall semesters.

Table 4
Tests of Differences between Pre & Post Test Means

	Spring 2007 n = 70 level of significance = .025 or 2.5% critical one-tail: t = +1.9955		**Fall 2007** n = 61 level of significance = .025 or 2.5% critical one-tail: t = +2.0010	
	Pr-test	***Post-test***	***Pre-test***	***Post-test***
Mean	29.714	70.036	30.861	69.713
Standard Deviation	9.987	14.126	12.415	14.362
t Stat	23.17		18.32	
Prob-Value	***1.42E-34***		***1.50E-26***	

Table 5
Tests of Differences between Pre & Post Test Means

Spring & Fall 2007 n = 131 level of significance = .025 or 2.5% critical one-tail: t = +1.9785		
	Pr-test	***Post-test***
Mean	30.248	69.886
Standard Deviation	11.154	14.182
t Stat	29.30	
Prob-Value	***2.02E-59***	

We arbitrarily set the level of significance at 2.5% (.025). The critical t statistics for the spring semester is t = +1.9955, for the fall is t = 2.0010, and the spring and fall combined is t = 1.9785. In each case the null hypothesis that the pre- and post-test means are equal must be rejected (not accepted). The probability values in each case are extremely small providing further support that the post-test means exceed the pre-test means. The statistical results support the hypothesis that the level of knowledge and skills acquired over each semester by students has increased significantly.

OUTCOMES

According to an Interpretation of AACSB Assurance of Learning Standards, "Regardless of the assessment tool that is selected for each learning goal, an acceptable, internal performance benchmark should be established to determine if student performance is acceptable or not. Such a benchmark could be based on the judgment of faculty or a pre-determined standard could be established." (AACSB Assurance of Learning, 2007, p. 11). Due to the difficulty of the exam and the standard of using 60% as a passing score for the class, the following benchmark was established by the department: at least 75% of the students completing MIS 205 will score at or above 60% on the MIS technology-related post-test.

Table 6
Outcomes Assessment

Score	#	Percentage	Cumulative[1]
90-100%	16	12.2 %	12.2 %
80-<90%	19	14.5 %	26.7 %
70-<80%	31	23.7 %	50.4 %
60-<70%	36	27.5 %	77.9 %
<60%	29	22.1 %	100.0 %
Totals	131	100.0%	

[1]The Cumulative column indicates the percentage of students with scores greater than or equal to the Score range indicated.

Table 6 provides a breakdown of the post-test percentage scores for MIS 205. As the data indicate, 77.9% of the students who completed the post-test scored at or above 60% on the exam, which satisfies the criteria established by the department.

Data will continue to be collected and evaluated from semester to semester, to evaluate whether student scores continue to meet the established outcomes. Also, due to the ever-changing nature of technology, the exam will need to be evaluated and revised on an annual basis, as the content of the course continues to evolve to keep pace with technology and the ever-changing needs of the business environment.

SUMMARY

The statistical analysis on the pre- and post-tests for both the spring and fall semesters support the hypothesis that there is a significant difference between the mean of the post-test and the mean of the pre-test. Overall, the summary statistics support the contention that students in the advanced computer applications course did learn a significant portion of the material. However, future assessment analysis is necessary to continue to test learning and to find weaknesses in student performance. Clearly, faculty can acquire necessary knowledge from the assessment data to strengthen their course.

The pre-/post-test process will continue to be used to evaluate the MIS component of the business core curriculum. The results will be incorporated into the annual assessment report and will be utilized in modifying the course content and/or the corresponding pedagogy and/or the test itself. The course is divided into five segments or topic areas: word processing, spreadsheets, database, presentation software, and website development. The next step will be to expand the analysis by comparing pre-/post-test scores by topic area.

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Student involvement/engagement in higher education based on student origin

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Abstract

This research study investigated student involvement/engagement based on educational origin. The 190 students in the sample graduated with bachelors' degrees from a public university in the southeastern United States in either 2006 or 2007.

Results of the data analysis showed that students were involved/engaged at their university on statistically different levels based on their educational origin. Indigenous students were different from the transfer students but the transfer students were the same regardless from where they originated. The indigenous students were the most involved, followed by transfers from junior/community colleges. Transfer students from four-year colleges and universities were the least involved/engaged.

Keywords: post-secondary education, student involvement/engagement, student retention, student persistence

Introduction

All across our country, colleges and universities face an ever-increasing problem of student attrition. The typical six-year graduation rate for most public institutions in the United States ranges between 50 – 56 % (Mortenson, 2005; Crosling, Thomas, and Heagney, 2008; and Berkner, He, and Cataldi, 2002). However, the Higher Education Research Institute (HERI) found the national six-year graduation rate for public universities to be slightly higher, at 58% (Astin & Oseguera, 2002). What is interesting about these statistics is that nearly half of all undergraduate students who enter public universities will not graduate within six years. Although institutions have responded to this quandary by implementing additional programs and services, student retention rates have not substantially improved (Seidman, 2005a).

Mary Stuart Hunter (2006), Director of Administration at the National Resource Center for the First-Year Experience and Students in Transition at the University of South Carolina—Columbia, contends, "Institutions in all sectors of higher education are attempting to increase student success by focusing on student retention" (p. 5). This retention problem affects both the students and the institutions they leave who feel the added economic burden caused by their premature departures. Indeed, the impact of student attrition extends beyond institutions of higher learning to the nation itself. Seidman (2005a) explains,

> A strong, vibrant, varied, and expanding national economy depends in part on the educational attainment of its citizens. A nation that values and promotes the educational attainment of its citizens is a nation that is concerned with its ability to compete in the global economy. (p. *xi*)

Retention is a campus-based phenomenon, and different types of campuses tend to attract different types of students (Berger & Lyon, 2005). According to Astin (1990), retention rates vary by campus due to the differences in the types of students attracted and recruited by certain schools, and it is imperative that institutions provide an environment and climate that fit well with their particular student populations. Therefore, it is the responsibility of particular colleges and universities to graduate the students who enroll at their institutions, and "each institution must tailor retention to fit the specific needs of its students and the context of that particular institutional environment" (Berger & Lyon, 2005, p. 3). Based on this premise the university, that is the focus of this study, developed an avenue of communication with its former students to obtain feedback specific to that institution.

While the literature on student retention focuses on at least four key contributing factors: student involvement/engagement; student interactions with faculty, administrators, and staff; student learning experiences; and student support services, the present study will focus solely on student involvement/engagement.

Student Involvement/Engagement

Several theories have emerged over the last several decades explaining the relationship between student retention and involvement. Much research by Astin revolves around the impact of student involvement on student outcomes in college, and his essential assertion is that students must be actively engaged in their surroundings in order to learn and grow in college (Evans, Forney, and Guido-DiBrito, 1998). Astin (1984) defines involvement as "the amount of physical and psychological energy that the student devotes to the academic experience" (p. 297).

Schlossberg's theory on marginality and mattering is also an important concept recognized in college student success (Evans et al., 1998). According to Schlossberg, students feel marginalized when they feel as if they do not fit it in, which leads to negative outcomes such as "self-consciousness, irritability, and depression" (Evans et al., 1998, p. 27). Feeling marginalized causes students to wonder if they "matter to someone else" (Schlossberg, 1989, p. 9). Schlossberg emphasizes the imperative that post-secondary institutions make students feel significant since that feeling precedes student involvement in college activities and programs.

The first step to becoming engaged and involved on college campuses is for students to interact with their peers. According to Schlossberg's theory, student-peer interaction is imperative if participating in campus activities and student organizations is to be meaningful. These interactions reinforce academic learning and also permeate into other areas of college life such "as discussing policies and issues related to campus activities; having serious discussions about religious, philosophical, or political beliefs; discussing personal problems; discussing the arts, science, technology, or international relations; and talking about an idea brought up in class" (Pascarella & Terenzini, 2005, p. 121). While it is true that students must experience academic success to remain in college, it is also vital that they become involved and engaged in other areas of college life. In fact, Gerdes and Mallinckrodt (1994) state that "personal adjustment and integration into the social fabric of campus life plays a role at least as important as academic factors in student retention" (p. 286).

From this research, it seems evident that students must become engaged in experiences which promote both academic and social reinforcement. According to Tinto (1993), however, "…it is entirely possible for individuals to achieve integration in the academic system of the college without doing so in the social domain" (p. 120). Additionally, Tinto found that students

who do not become socially integrated may or may not suffer from persistence issues, depending on the individual. Therefore, failure to become involved in campus activities, organizations, and extracurricular activities, which promote involvement and integration of college life, can lead to higher chances of attrition for some students.

One of the most widely known types of college organizations are Greek organizations. Some higher education professionals are somewhat dubious regarding the impact of these organizations on academics, as Pike reported in a 2000 study. Pascarella, Flowers and Whitt (2001) discovered, however, that the negative effects of Greek affiliation decreased after the first year, and for sororities yielded increases in writing skills and scientific reasoning. Although the findings regarding the impact on academics is somewhat ambivalent, Pike and Askew (1990) clearly conclude that belonging to these Greek organizations contribute psychologically to a student's sense of community and also increase levels of involvement on college campuses. When students feel like they are a part of the campus community, the more likely they are to feel loyal towards their institution and persist (Bean, 2005).

Additionally, students become involved and engaged in campus life is through service learning. Astin, Sax, and Avalos (1999) indicated that higher education administrators are placing more emphasis on service learning. Service learning improves students' grades and enables them to better apply principles from the course to real-world experiences and situations (Markus, Howard, & King, 1993). However, the most important discovery about service learning might be what Berson and Younkin reported in their 1998 study (as cited in Pascarella & Terenzini, 2005): students who participated in required service learning as an integral part of their coursework and program developed relationships with fellow students and felt more integrated with their programs and academic communities.

Another way students become involved in campus life is through organizations and experiences which promote diversity. As cited in Pascarella and Terenzini (2005), Gurin purports that involvement in diversity experiences enhances student learning, and that the level of student body diversity predicts the degree of student involvement in diversity experiences. Examples of those types of experiences include attending racial-cultural awareness workshops, discussing racial issues in groups, socializing with different racial/ethnic groups on campus, and developing close friendships with students who belong to different races/ethnicities. More importantly, involvement in these various diversity experiences positively effected student learning (Pascarella and Terenzini, 2005). Students from this same study also self-reported gains in course knowledge and skills, and felt more likely to persist until graduation. Therefore, the importance of diversity experiences cannot be overlooked as a vital aspect of involvement and engagement on the college campus.

Finally, students may become involved and engaged in campus life is through participating in athletics (organized or intramural), and extracurricular activities. Pascarella and Terenzini (2005) report that students who participate in athletics (especially men who play basketball and football) consistently scored higher on standard measures of learning than their non-athletic peers. The authors claimed that women who participated in athletics did not experience any significant negative effects when compared to their non-athletic counterparts, except in the area of reading comprehension during the third year of college. Van Etten, Pressley, McInerney and Liem (2008) found that college seniors listed extracurricular activities as an important factor in their college persistence.

Origin of Students and Student Retention

While many students begin their college experience at the same institution from which they will eventually graduate, other students transfer to that institution. Just like new first-time first-year students, these transfer students are entering a new institution with which they are unfamiliar. Most institutions give far less attention to transfer students than to their cohorts (Kuh et al., 2005). Therefore, students who transfer to the university must acclimate themselves with their new institution without as much assistance as is often provided to new incoming students, including becoming familiar with their instructors, staff, new friends, and other varying nuances of the institution. These transfer students often do not know the resources available to them and the opportunities for engagement and involvement in campus activities. As a result, transfer students often face difficulty becoming involved and engaged socially and sometimes academically at the university. This is because transfer students have little in common with current students at the universities to which they transfer and usually find it difficult to connect with other transfer students (Kuh et. al, 2005). Consequently, transfer students often feel disconnected from their institutions. Tinto (1993) holds that many students who transfer to the university from junior and community colleges will be much more limited with their involvement and engagement in campus activities, learning experiences, and also interactions with other students.

The university in this study receives most of its students as transfers from junior/community colleges or other colleges and universities. Over 60% of the university's student population is composed of such students. It is important for all universities, especially those like the one in this study, to assist transfer students in acclimating to their new institution, communicating to them the importance of becoming involved and engaged both academically and socially. This involvement/engagement can sometimes be challenging for transfer students, who are often overwhelmed when entering a new institution and also have other competing forces for their time, such as jobs and family (Tinto, 1993). However, Kuh et al (2005) contend that it is vitally important for these students to become involved and engaged at their institutions. Efforts must be made so transfer students do not merely view the university as a place to complete their degree. Kuh et al. also argue for the implementation of programs specifically for transfer students to help these students become active members in the university community. When students feel connected and involved with their institutions, they are more likely to persist and graduate (Pascarella and Terenzini, 2005).

The present study addressed the following research question: is there a statistically significant difference in student involvement/engagement based on whether a student is indigenous to a university or transfers there from either a junior/community college or from a four year college/university. When students come into the university from diverse backgrounds, does it make a difference in their level of involvement/engagement?

Methodology

Participants

Two thousand two hundred undergraduate students who had graduated from a public university in the southeastern United States in either 2006 or 2007 were sampled.

Approximately 234 undergraduates (approximately 10%) between 20 and 79 years of age responded to the online invitation to participate in this study.

Instrument

An online questionnaire was created using an online surveying software tool by the university's Office of Institutional Effectiveness. This questionnaire was constructed based on the research literature in the field of student satisfaction and retention.

The following demographic information was requested: gender, age, race/ethnicity, transfer status, number of semesters attended, full/part time student status, G.P.A., hours spent working per week while a student, campus attended, commuting distance, academic major, and current employment status and salary. Additionally, the survey instrument measured the level of student satisfaction in a number of areas which are related to student retention: involvement and engagement in university experiences, learning experiences in academic coursework, on-campus student support services, and faculty availability/approachability.

The questionnaire was field-tested a few months prior to administration by experts who confirmed its content validity in focus group meetings. The focus group participants made recommendations regarding the aesthetics of the survey instrument, and the appropriate changes were made. The reliability of the data was assessed using Cronbach's alpha on the Likert scale student satisfaction questions. That assessment yielded an alpha of .77 for involvement and engagement university experiences. Based on the reliability results, the instrument was considered to yield reliable data.

Procedures

The potential participants were emailed the link in February 2008 and were given until the end of March 2008 to complete the questionnaires. Informed consent statements were also included in that email. The questionnaires took approximately ten minutes to complete. When the survey window closed, the data from were downloaded into Excel and imported into SPSS software for storage and analysis. The current researchers obtained permission from the university's Institutional Research Board (IRB) to use these data collected in this research study.

Results

One hundred ninety subjects responded to questions about student involvement/engagement. Students indigenous to the university had a mean of 20.27, with a standard deviation of 7.85, while the transfers from junior/community colleges had a mean of 13.35 and a standard deviation of 7. By contrast the transfers from other colleges/universities had a mean of 11.95 and a standard deviation of 6.89.

An Analysis of Variance (ANOVA) was conducted to evaluate the differences in student involvement/engagement based on how the students entered the university. The independent variable, the student origin factor, included three levels: indigenous to the university, transfer from a junior/community college, and transfer from another four year college/university. The dependent variable was the student involvement/engagement variable. The assumption of equality of error variances was met, Levene's $F(2, 187) = .04$, $p = .97$.

The ANOVA was significant, F (2, 187) = 24.96, $p<.001$, partial η^2 = .21, observed power = 1. Post-hoc comparisons showed that the indigenous students were different from the transfer students but the transfer students were statistically equal regardless from where they originated. The indigenous students were the most involved, followed by transfers from junior/community colleges. Students from other four year colleges and universities were the least involved/engaged.

Discussion

The results of the present study showed that there was a statistically significant difference in student involvement/engagement based on whether a student was indigenous to a university or transferred there from either a junior/community college or a four year college/university. Based on the results of this study, the institution should implement tailored programs to assist transfer students when acclimating to a new institutional environment. These efforts concur with retention research conducted by Berger and Lyon (2005). Therefore, higher education administrators should work diligently to provide opportunities for students to get involved with campus organizations and activities.

The institution on which this study is based receives a larger proportion of transfer students than most other four year institutions. These transfer students have been less involved/engaged, which is important because those students often feel marginalized and experience other negative consequences (Evans et al., 1998; Schlossberg, 1989). While transfer students often view their institution as merely a place to take courses, Tinto (1993) purports that academic engagement alone is not enough to help some students persist. Social integration and involvement provide counterbalance. Pascarella and Terenzini (2005) also report that students who are involved and engaged (e.g. athletics, extracurricular activities) at their institution are more likely to experience success in the classroom and complete their academic studies. Based on the importance of student involvement/engagement, this institution must spend most of efforts on helping transfer students become involved/engaged in not only their learning experiences, but also campus life, activities, etc.

Pascarella and Terenzini (2005) indicate that service learning plays an integral role in student engagement. Specifically, students who participate in service learning often earn better course grades and are better able to apply skills learned in their courses. Additionally, these students form deeper relationships with fellow students and feel more integrated with their communities. Tinto (1993) elaborates that interactions among students should include discussing policies and issues related to campus activities, having serious discussions about religious, philosophical, or political beliefs, discussing personal problems, discussing the arts, sciences, technology, or international relations, and discussing class ideas. While these discussions can sometimes occur inside the classroom, Tinto states they extend beyond the classroom as well. Based on this research, academic programs at the university that is the subject of this study should emphasize the importance of service learning to transfer students and their faculty, ensuring that they focus on building relationships with other students while participating in service learning projects.

Diversity experiences are also essential in helping transfer students acclimate to a new institutional environment, which includes becoming familiar with the various groups that comprise the student population. Examples include attending racial/cultural workshops and also socializing and establishing relationships. Pascarella and Terenzini (2005) concluded that

students reported higher gains in academic skills and knowledge and were more likely to graduate than cohorts who did not participate in enriching diversity experiences. While most higher education professionals realize that student diversity should be encouraged in the classroom, they also need to realize that diversity experiences outside the classrooms should also be promoted and supported.

When students transfer to new institution, they often are unaware of all the campus resources and activities available. These students also find it challenging to connect to both the indigenous and other transfer students (Kuh et. al, 2005). The institution in this study currently has a transfer student association to provide opportunities for transfer students to meet and support each other. Also, the institution provides a list of both academic and campus resources (along with their web pages) that will help students become involved in campus life. Additionally, the institution publishes a newsletter for transfer students each semester that includes a list of important dates, major events, and how to become involved in activities if they are uncertain about where to start.

Recently, the university being studied developed a strategic initiative that includes the creation of "a Student Success Center which brings together all facets of student affairs and academic affairs in a university think tank collaboration. Representatives from the Office of First Year Experience, Student Support Services, Division of Undergraduate Studies, Student Government Association (SGA) and Southern Miss Activities Council (SMAC) are teaming with administration officials to establish a blueprint" for the development of this center (Arnold, 2009). Also, the university has initiated "a late-night programming effort" that will be held periodically throughout the academic year at a restaurant on campus and will include "live entertainment, food and beverages" (Arnold, 2009). While planning for this initiative, administrators wanted to involve as many students as possible. "One thing our committee looked at from the start was how to reach out to more students. And we wanted something they could do right here on campus. If a student wants to come here and earn a degree, then we want to make sure we provide that student with the support needed to help them achieve that goal" (Arnold, 2009).

However, Jones (2001) asserted that merely offering such resources is inadequate to help students succeed and argues that students must be compelled to utilize such resources. Jones also suggested constant collaborative activities between administrators, professors and student support services. This includes the incorporation of support services or other supportive resources into class curriculum, class visits to support centers, or simply encouraging students to take advantage of support services and become involved in campus activities. When transfer students utilize resources and participate in campus activities, they become more involved and connected with their institution.

Tinto (1993) stated that "Nowhere is the importance of student involvement more evident than in and around the classrooms of the college" (p. 132). It is important that faculty use their classrooms as gateways to help students become engaged in their respective programs through activities and other learning experiences. While most student engagement still occurs in the classroom, Kuh, Kinzie, Schuh, Whitt, et al. (2005), report that some institutions have been able to implement activities outside of the classroom to help improve both student involvement and engagement. Tinto (1993) asserts, "Classrooms can be understood as smaller educational communities that serve as both gateways to and intersections for the broader academic and social communities of the college" (p.133).

Indeed, it is this broader involvement with the college at both the social and academic levels that is so vital to the student's persistence. While Tinto (1993) reports that academic involvement is more important than social involvement for almost all colleges and universities, he also claims that academic engagement alone is not enough to help some students persist. Tinto goes to say that social integration and involvement may possibly counterbalance the absence of academic involvement. Either way, the importance of student engagement and involvement cannot be overemphasized, and it is a necessary part of student development and persistence, and it is imperative that college professionals make efforts to engage students in activities which will allow them to become involved in the college community. Tinto best summarizes the importance of student involvement on student learning: "In this manner, the argument about student learning moves beyond the simplistic notion that students are alone responsible for their own effort to the more complex notion that institutions also influence the quality of student effort via their capacity to involve students with other members of the institution in the learning process" (Tinto, 1993, p. 132).

Retention continues to be an important issue facing our colleges and universities--for the students, institutions, and the nation. Not only are institutions impacted financially when students leave, but students who leave college without graduating often accumulate large amounts of debt. According to Schuh and Ross (2005), the average college student borrows over four-thousand dollars, and more students are borrowing money now to pay for college than any other time. To complicate matters, when students do not graduate and have nothing to show for these debts, they often become disenfranchised with higher education and discourage others who are considering attending college.

Colleges and universities are responding to these challenges by constantly seeking new ways to help ensure the success of their students. According to Tinto (2005), more research is needed so that a more powerful theory can be developed which better explains why students leave college. He contends that current theories and formulas are only rough predictors of departure and are also limited in what they can tell us about the forces that shape and impact student persistence. Furthermore, Miller (2005b) claims that current persistence rates point to a problem, and action is needed now to address and resolve student persistence issues so students can thrive and succeed in college (Kuh, 2007).

Limitations

- The present study was limited to the 2006 and 2007 academic years from a single university in the Southeastern United States and therefore cannot be generalized beyond that scope.
- Only students who graduated with a bachelor's degree were included in this study. Students who dropped out or stopped out were not available for participation in the study.
- The wording of the questions in the instrument limited the participants' responses.
- The questionnaire was sent to potential participants via online delivery. Therefore, any recent graduates without computer and internet access could not participate.

Recommendations for Future Research

- Broaden the scope of the study to include other institutions in other regions of the United States.

- Enlarge the study to include graduate students who completed their degrees.
- Collect data from students who did not complete their degrees.

Summary

Research shows that as levels of student involvement/engagement increase, so does student retention in higher education. Several post-secondary activities have been related to student retention: peer interactions inside and outside of the classroom, membership in Greek organizations, participation in service learning projects, involvement in athletics and extracurricular activities, and diversity experiences.

Transfer students, whether from a junior/community college or from a four year college/university tend to become involved/engaged in campus life at lower rates than indigenous students. Post-secondary institutions should consider special services to such students to increase student retention.

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An analytical study of music textbooks used at the elementary school in Chinese society

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ABSTRACT

The purpose of this research is to analyze the music education materials used at elementary schools between Macau and Taiwan and further give recommendations for the future improvement and promotion of music education in Macau. The findings of this study are as follows: 1) The shortage of its own music materials and publishers in all subjects which is a missed opportunity for local Macau students to learn the most suitable and provincial contents of all subjects; 2) Insufficient use of globally successful music methods results in a self-enclosed regional mentality towards education with less emphasis on international inputs and influences; 3) Missing systematic and efficient curriculum guidelines at all school levels results in the repetition of students' learning and unsystematic acquisition of knowledge.

Keywords: Music Education, Textbook, Curriculum, Music Classroom, Orff Method, Kodaly Method

Introduction:

The purpose of this study is to investigate the current status of music class and music materials used at the elementary school in both Macau and Taiwan in order to promote music education efficiently in the both mentioned Chinese societies. Macau was politically colonized by Portugal for the past 400 years and returned back to China in 1999 while Taiwan was colonized by Japan between1895-1945. (Bei 2005) (Table 1)

Due to its historical background, Macau has thirty-one unique sites of its region which have been recognized by the UNESCO`s World Heritage Center in the 2005. (Bei, 2005) The Macau government has been promoting cultural and fine art education over the past four years. Not only have the visitation of international tourists been increasing dramatically, but the amount of international well-known performances has also obviously been increasing in Macau after the region retuned back to China. However, despite the government of Macau promotional efforts to promote art education in over the past years, music education at all school levels still remains at the same level as it has been in the past years without much progress being made in Macau. The absences of basic music knowledge and musicianship are common challenges for all school levels students in Macau. Chang (2002) believes that the purposes of music education at the elementary school are: 1) to cultivate students' moral; 2) to inspire students' aesthetic ; 3) to introduce students' understanding of fundamental musicianship, and 4) to stimulate students' recognition of their own nation. The initial problems of music education in Macau are the unsystematic contents of music class and the absence of music textbooks at all school levels. Instead of publishing its own music textbooks, local schools either borrow music textbooks from neighboring regions, such as Hong Kong, and mainland China or create their own materials for each class period and change them every year. All of the above mentioned facts result in the fact that not only can't the local Macau students enjoy efficient music learning experienced in

neighboring regions, but the students also lack the opportunities to learn their own cultural and musical heritage from their own music textbooks.

In contrast, not only does the Taiwan government have several governmental and non-governmental textbook publishers; but surprisingly the textbook publications all include the latest and most up-to-date trends and current music methods so that the author believes that the local students can learn first hand information and increase their worldwide competitiveness. Moreover, the contents of music textbooks are organized systematically without much confusion and repetitive materials so that students can have a chance to learn a series of organized music knowledge from the beginning of elementary school right up to the graduation of high school. Furthermore, the music concepts are introduced step by step at each grade in the textbooks so that the students' learning potential can be motivated and developed under the best circumstance. In conclusion, the systematic music contents and approaches have shown that an increasing number of talented students from Taiwan have won lots of international awards and recognitions in the past years (Cheng, 2003). Baker (2000) believes that music classes should be taught thoroughly and systematically from kindergarten up to high school despite any differences in individual students' ability between each grade. The essence of the music education in elementary education is to provide students a solid fundamental knowledge of music musicianship; and combine music with other art genres in order to cultivate students' sensitivity towards the appreciation of the arts.

Table 1: General Characteristics of Macau and Taiwan

	MACAU	TAIWAN
Colony	Portugal (1553-1999)	Japan (1895-1945)
Official Language	Cantonese, Portuguese and Mandarin Chinese	Mandarin Chinese
Area (Square Miles)	10.42	13,896
Population	544,200	23,082,125
Currency	Macao Pataca (MOP)	New Taiwan Dollars (NT)
Currency Rate	US$1 = MOP$ 8.0	US$ 1 = NT$ 32

(Source: The Statistics and Census Service Center, 2009)

The purpose of this study is to investigate the current status of a music class and the music materials used at elementary schools in both Macau and Taiwan in order to promote music education efficiently in both mentioned Chinese societies. By applying the successful teaching experiences from Taiwan; Macau students can benefit and be better motivated in music class. By analyzing the music materials which are currently used in the both cities, the researcher suggested using systematic music contents and music methods which the researcher believes can motivate students' interest in music and make music classes become an enjoyable experience in both Chinese cities.

The Analysis of Music Textbooks:

The textbooks reflect values, cultures and educational levels. Fan (1990) believes that a successful music textbook should: 1) help students to understand and appreciate music; 2)

cultivate students ability to use basic instruments, such as the recorder and small percussion instruments, e.g. the triangle and the tambourine, etc.; 3) train students to foster their ability to use creativity and improvisation; 4) help students to understand their own nation's artistic heritage and further explore the cultures of foreign countries internationally; and 5) cultivate students' sensitivity of the arts and eventually become a more well rounded person. However, the absence of the region's own textbooks would cause students to neglect their own culture and heritage. (Chang, 1994) Moreover, not only do these facts cause the students to miss the chance to communicate with the outside world; but the students also miss the chance to adapt to the most update knowledge currently available.

The textbooks at elementary schools used in Macau are either from neighboring regions, such as: Hong Kong and mainland China or the local teachers' own materials. Macau does not have its own published textbooks or any curriculum related publications. According to the survey, "Long Man Music", "New Primary School Do-Re-Mi", and "Today Music" are the most used top three elementary school music textbooks in Macau. The "Long Man Music" textbooks package which are published in Hong Kong, included student music textbooks (12 volumes), teachers guide books (12 volumes), creative flash cards, computer software, recorder music textbooks (8 volumes), Children's Musical textbooks (8 volumes). (Long Man Music, n.d) However, according to the teachers' questionnaires, more than 40% of the surveyed elementary school music teachers in Macau admitted that they still used their own teaching materials most of time in their own music classes privately rather than following the school's guidelines and requirements. This fact causes the problem that not only do the Macau students not have a systematic music learning system with which to follow, but the music competency of each student from each school is varies.

The strengths of the current music textbooks used in Macau focus on international folk songs, such as, Japanese, Korean and African children's nursery songs and folk songs. The folk songs from different provinces of mainland China are also included in the textbooks. (Table 2) The researcher believes that it is important to provide a global point of view for children and let children appreciate the different cultures and arts in the music class. Cheng (2003) also indicates that the appearance of introducing the usage of different small percussion instruments and providing enough percussion exercises for children in music textbooks can not only heighten elementary school students' interest but also motivate their music learning and stimulate children's improvisational skills.

Moreover, Hoffer (1993) indicates that the importance of adapting other nation's folk songs can not only help children to understand the cultures, but children also can learn to appreciate how composers used different elements to create different types of music. However, the whole set of textbooks used in Macau lacks any systematic arrangement on music theory, such as, key signatures, rhythmic progression, and basic musical notation. For example, the music used in the 1st grade music class is supposed to be inspirational, introducing progressive elements in order to heighten students' interest and motivation rather than introducing complicated rhythmic patterns and key signatures (Yao, 1993). The non-progressive introduction of musical rhythms and music notations may create a disorganized perception of the 1st grade students learning progression. Furthermore, repeating the same music concepts and music theory at each level of music class may cause confusion of music concepts for children and render music learning redundant. Hoffer (1993) even believes that the music education is the only chance that students accept a series formal music training in their entire studying period. This is the period that teachers should provide students a solid fundamental of all subjects.

In contrast, the textbooks used at all school levels in Taiwan have all been edited, compiled and published by the National Institute for Compilation and Translation. Since 1988, non-governmental publishers were allowed to publish and compile school textbooks as the selection textbooks by the local schools but the textbooks must be examined and verified by the National Institute for Compilation and Translation in Taiwan. (Chen, 1986). This regulation not only provides clear guidelines for both school teachers and students to follow, but the guidelines also unify all students' learning progress in each subject and ensures learning progression and efficiency.

In Taiwan, the current selection of songs from the music textbooks of each publisher at elementary school all include local Taiwanese, Chinese folk songs and international children songs, such as, American European, and Asian nursery songs. Moreover, the three major music teaching methods, such as "Orff Music Method", "Kodaly Music Method" and "Dalcroze Music Method" are all included and applied in each introduced song. Among all of the governmental and non-governmental textbook publishers, "Han Lin publisher" and "Nan-I publisher" are the two most popular and common used music textbooks used at the elementary school level in Taiwan. Not only do these textbooks include the concepts of the global most successful and popular three music teaching approaches, but recorder training is also required as one of the fundamental approaches to music training at the elementary school level in Taiwan. The systematic contents and approaches help not only to ensure that elementary school students have concrete and systematic music knowledge, but they are also able to play the music instrument recorder fluently before graduating from the elementary school after six years training. Moreover, the students are acquainted with western and eastern music knowledge and composers through the series of textbooks. The research done by Wang (2008) proved that stimulating children's brain with exotic tunes and different combination rhythmic patterns can help children's social skills in the future. Champion (2006) also concludes her dissertation and believes that the modern music methods not only were valuable educational approaches, but the methods also provide a framework that allows.

Table 2:
The Comparison of Music Textbooks Used at the Elementary School between Taiwan and Macau

	TAIWAN	MACAU
The Characteristics of the Music Textbooks	* Multicultural and focus on various folk songs from any provinces of mainland China and different regions of Taiwan	* Mainly are Chinese Folk Songs * The textbooks focus on the international folk songs, such as, Japanese and Korean and African folk songs * Lack of local Cantonese folk songs
The Contents of the Music Textbooks	* The introduction of music theory, rhythms and key signatures are progressive and systematic * The contents of the textbooks from all levels are not repetitive and redundant. Students can fully learn different music concepts at each grade of textbooks systematically	* Lack of a systematic arrangement of the basic music theory throughout all levels, such as, rhythms and key signatures * The contents of textbooks are repetitive at all levels
The Publications	* The textbooks are officially unified. They are either compiled by the government and/or private (non-government) publishers.	* The textbook publishers are from Hong Kong and/or Mainland China * There are neither textbooks are owned and compiled by the Macau government nor by the private (non-governmental) publishers
The Application of the International Music Methods	* The application of the most current music approaches, such as, Orff, Kodaly and	NO

	Dalcroze music method * Lots music creative activities and improvisational exercises with Orff, Kodaly and Dalcroze music method	
The Learning of Instruments	* Focus on introducing different small percussion instruments * Starting from the 3rd grade, learning recorder is part of the required fundamental knowledge of the music textbooks	* Focus on introducing different small percussion instruments
The Overall Evaluation of Music Textbook	* The introduction of music theory, rhythms and key signatures are progressive and systematic * Recorder training is part of the basic requirement * Application of the most current music methods, such as, Orff, Kodaly and Dalcroze music Approach into the Chinese folk songs	* Multi-elements, including Western and Eastern music knowledge; Classical and Jazz music * Focus on the introduction of small percussion instruments * The colorful textbooks heighten students' learning interest

students to learn music musically and cognitively. The most important, the inclusion of the "Orff Music Method", "Kodaly Music Method" and "Dalcroze Music Method" in the textbooks helps students' music learning experience using a fun and interesting approach and have further connection and follow the most popular trends in music learning internationally.

The Analysis of Teachers' Questionnaires:

Moore and Bonney (1987) proved that the teachers effectiveness of teaching significantly affect students achievement of learning. Moreover, Sims (1986) revealed that the more passionate the teachers, the better achievement students usually become; therefore, in order to

investigate the efficiency of the music class and the existing problems of music education, the researcher needs to find out the effectiveness of current music teachers. The researcher designed an anonymous questionnaire for the current music teachers in both Chinese cities. There were 80 music teachers from Taiwan and another 80 music teachers from Macau that participated in the questionnaire survey. The author believes that the questionnaires can reveal the problems of the current status of music education in both regions from the teachers' professional point of view. (Table 3)

The questionnaire includes the information of the usage of music methods and textbooks; the current music facilities at the elementary school and the expectation of current music teachers. The author believes that the anonymous responses from the surveyed music teachers will provide the most reliable and accurate information for the current status of music education. The expectations for the future development of music education from the current music teachers were also included in the questionnaire. Furthermore, the answers to the questionnaires revealed the effectiveness and encouragement from the government and school principals.

The result of the teachers' questionnaires from the two Chinese cities revealed the differences of music education promotion and teachers' competency may cause relatively different results of teaching approaches and students' learning progression. Surprisingly, more than 40% of the surveyed Macau elementary music teachers admitted that they still used their own teaching materials in their class privately rather than following the schools' requirements. As well, there were quite significant numbers of the current music teachers in Macau who expressed that they didn't feel the support of music/art class at school. Some of the school teachers admitted that they used only one textbook to teach for the whole school year while they should, in fact, have used two textbooks for the two semesters, in a personal interview. Furthermore, almost 70% of teachers think the region should have its own music published textbook rather than borrowing other neighboring regions' publications. Wang (2003) believes a locally published textbook could not only unify students' learning competency in the region but can also provide students with a more complete appreciation of their own cultural heritage and recognition of their own unique national characteristics. The result of the questionnaires also showed that despite the fact that nearly 40% of teachers believed that the Orff, Kodlay and Dalcroze music method can enhance teaching, 76% of music teachers still didn't include such methods in their music class in Macau. On the other hand more than half of the surveyed Taiwanese music teachers have used the methods in their class. According to the survey, the top two main reasons preventing Macau teachers from using such methods were lack of professional knowledge and encouragement from their respective schools. In contrast to Taiwanese teachers who already have experience and knowledge, therefore there are a relatively lower number of the music teachers who lack professional knowledge and encouragement from their schools.

Regarding the challenges of promoting art/music education in the region, more than 40% of current teachers think the absence of music textbooks and insufficient support of music education within the school environment are their main concerns in Macau while the music teachers in Taiwan also shared similar concerns as well. The response reminded us that there is still a lot of room in which to promote music education in both Chinese regions.

Table 3:
The Result of the Music Teachers' Questionnaires for Macau and Taiwan

Questions	Responses	MACAU (Percentage)	TAIWAN (Percentage)
1. Which music textbook does your school use?	Long Man Music	36 %	X
	New Primary School Do-Re-Mi	22 %	X
	Today Music	20 %	X
	Your Own Materials	22 %	0 %
	Han-Lin Publisher	X	56 %
	Nan-I Publisher	X	44 %
2. Do you use your own materials rather than following the school guidelines and requirements?	Yes	42 %	2 %
	No	40 %	94 %
	No Comments	18 %	4 %
3. Do you include the Orff, Kodaly or Dalcroze Music Methods in your Music class?	Yes	18 %	54 %
	No	76 %	32 %
	Others	6 %	14 %
4. Do you think the music activities, Orff, Kodaly and Dalcroze, can enhance music teaching?	Yes	39 %	56 %
	No	26 %	30 %
	Not Sure	35 %	14 %
5. What might prevent you from including the music activities of Orff,	Not applicable	20 %	56 %
	Less interest from students	16 %	20 %
	Lack of professional knowledge	42 %	24 %

Kodaly, Dalcroze Method in your class?	Lack of encouragement from the school	22 %	14 %
6. How do you evaluate the promotion of arts education in your school?	Good	20 %	46 %
	Average	26 %	42 %
	Poor	54 %	12 %
7. What are your main Concerns regarding music education in your region?	Absence of Music Textbooks	45 %	0 %
	Insufficient support of music education within the school environment	48 %	36 %
	Less interest from the students	26 %	24 %
	Lower Competence of music teachers	42 %	26 %
	No Problems	6 %	2 %
8. Do you think the Facilities in your music classroom are sufficient?	Yes	36 %	36 %
	No	42 %	40 %
	Not Sure	22 %	24 %
9. Do you think the region should have its own music textbook publisher?	Yes	68 %	0 %
	Not necessary	32 %	100 %
10. What is the overall level of students' competence in your music class?	Below Average	34 %	24 %
	Average	52 %	56 %
	Above Average	14 %	20 %

Conclusion and Recommendation

Teaching music should be enjoyable, inspirational and educational. The writer suggests that the music textbooks at all levels should not only be unified in the region, but the contents of learning should be systematic and progressive. Each grade of learning content should include a series progression of different musical knowledge and related music activities so that learning can be more inspired and motivated. Music classes shouldn't be a one way teaching and learning process. Music teachers can include more music creative activities and group games along with the progression of music textbooks in the classes at all levels rather than a one way approach. The introduction of music textbooks should start from the basic C major and include numerous Chinese folk songs in the early stage of elementary school so that students can start learning their own cultural heritages at the early stage of their life. Moreover, instead of teaching students different key signatures and complicated rhythms at the early stage of elementary school, young children should be taught fundamental music theory and singing correct pitches systematically. Furthermore, just like any other knowledge, the introduction of music concepts should be progressive and organized; therefore, the writer suggests that the introduction of rhythmic concepts should start from the basic half note, quarter note, eighth notes and rests rather than the complicated rhythmic patterns.

Furthermore, the concepts and approaches of Orff, Kodaly, and Dalcroze music methods should be included in the music textbooks at all school levels so that the Asian students can also benefit from the international successful approaches and make music learning processes more motivational. Undeniable, these methods have been the most popular and efficient music approaches used in music education worldwide since the 20th century; the regions should follow the most current educational trends and learn from successful experiences from others. The theory of success behind these music methods are the musical interaction between teachers and students. This is the essence of any successful music class which allows both students and teacher to actively participate as one in a progressive and constructive manner. If this outcome can be achieved, the results can be the catalyst for future growth and nurture the trend of a positive mentality and greater motivation for teachers and students alike. Such a goal achieved will ensure continued and elevated results the likes of which may not have been otherwise achieved. Based on this approach students are not only inspired by knowledge based music activities in the classes, but these approaches can also attract students' interest and attention and propel them towards greater and more accomplished successful learning processes. Furthermore, young children can learn interaction with others and promote their social skills through body movements. Students can learn both to "feel" and be "affected" by music during the early stages of their learning progression.

To conclude, the official curriculum guidelines which were published by the Direcção dos Serviços de Educação e Juventude (Education and Youth Affairs Bureau, Macau), for all school levels should be updated with the most current trend of international music education. Until now, the most current music curriculum guidelines for both elementary school and high school were published in 1999 with many repetitive and redundant concepts used throughout (Wu, 2009). Macau should publish its own textbooks which include its own culture, values and history under the guidance of the local government in all subjects at all school levels. By comparing with others, the Macau government should learn from others' successful experiences and adapt these successful experiences into its own textbooks. The music textbooks have to be systematic, progressive and comprehensive with a global point of view so that the local students can most

benefit from them. All children within Asian communities should have the opportunity to be exposed to the same musical concepts and level of art appreciation which can be found in the international music arena. This together with the adoption of a set of government directed guidelines or standards that could be used by all music faculties in Macau would present a template which teachers could use to present their own music teaching materials. Textbooks and further teaching materials could be government approved and locally published adhering to these set of standards, while allowing for some degree of artistic freedom and musical interpretation to express local culture, values and customs. The researcher firmly believes that by applying a set of standards in such a way would not only provide teachers with greater teaching confidence as they would have a single template to look to rather than loosely applying their own, sometimes innocently misguided practices; but perhaps most importantly, provide the students with the most up-to-date and essential teaching materials to further enhance and promote their musical growth and talent at a regional level.

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A study of suitable environmental education process for Thai schools context

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Abstract

This is a qualitative research aimed 1) to study the environmental context of schools according to curriculum, policy and action plan; 2) to study strategies and procedures in providing environmental education activities; 3) to study problems and suggestions in practice of environmental education; and 4) to suggest the guidelines for suitable environmental education process for Thai schools context. Focus group interview was used in this study for a sample of 20 schools from elementary, expanded opportunity, and secondary schools of Khon Kaen, Mahasarakarm, Roi-Ed, and Kalasin provinces. Key informants were 100 teachers and 140 students. Instruments used in this study were interview checklist and digital camera. Content analysis was used to analyze data. The findings showed that 1) environmental issues were not directly addressed in school-based curriculum but were indicated in some subjects; 2) most of environmental projects and activities were environmental projects and were initiated by the teachers; 3) a lack of environmental knowledge, awareness, and collaboration were major problems in providing projects for the environment apart from lacking of money allocation and necessary equipments. In addition, 7 guidelines for the suitable environmental education process for Thai schools context were 1) environmental issues should be addressed in a vision of school-based curriculum, 2) environmental education should be indicated in school policy and action plan, 3) student-centered and integration instruction using community resource should be used in providing learning activities, 4) enhancement of self-directed improvement of teachers' awareness toward environmental activities by providing a workshop and promotion of cooperation among stakeholders in school, 5) providing activities to develop the desired characteristics of the students and empowerment the students to launch the environmental projects by themselves, 6) physical environment of school should be decorated to be learning resource, and 7) a school superintendent should allocate personnel, time, money, and continuous support for environmental projects.

Keywords: Environmental education, environmental process, environmental context, suitable process, Thai schools context

Introduction

Our natural resources are being depleted and environmental degradation is increasing because of our unsustainable patterns of production and consumption, uncontrolled population growth, and inequality of social and economic (UNESCO-UNEP, 1994). These problems will cause more and more strain on the earth's natural resources and habitats (Asano, 1991).

In solving environmental problems, it is imperative that every person develops an informed awareness of the limits of our natural resources and understand the interrelationship among living and nonliving elements in the cosmos or the whole environment. Human should conserve and protect nature not only for human benefit but also for nonhuman nature (Schulze,

1996). If we do not do so, we will destroy ourselves and our society (Huckle, 1991; Fien & Trainer, 1993). At present, everyone knows and acknowledges environmental problems but comparatively few people truly understand and are aware of an importance of the environment. It is difficult and time consuming to persuade other people to appreciate the value and worth of the environment. To achieve this, new attitudes, skills, knowledge, awareness and behaviors towards the environments are needed. Hence, environmental education for every level of education may be an appropriate way to help us face our environmental problems (Fien & Trainer, 1993; UNESCO-UNEP, 1994; Viravaidaya, 1994). Environmental ethic should be enhanced and install in the learners' mind. Education in, about, and for the environment are three categorical approaches of environmental education. Education in and about the environment are intended to develop knowledge, awareness, attitude, and skills. Education for the environment is intended to enhance values, ethics, problem-solving skills, and action (Spork, 1992). It is education for the environment that seems to have the potential contributing most to the general well being of environment (Fien, 1988; Sonneborn, 1994). Teaching and learning on environmental education is necessary. It is needed to teach students to act for the environment. In Thailand, there is no an environmental education subject at the basic education level. Environmental education is taught only in science subject but environmental education is related to all subjects. According to the Ministry of Education, there are 5 guidelines in providing environmental learning activities in schools. These are 1) environment and school context; 2) personnel relationship; 3) activity campaigns about environmental conservation; 4) environmental management in school; and 5) environmental collaboration between school and community (Sri-ootta, 1998; Krapeedang, 2000; Sook-kasem, 2001). There are quite a few studies reported information about environmental education process for Thai schools context. In addition, Thathong (2005) said that it is about time for all Faculties of Education should improve their curriculum and learning activities for all prospective student teachers to have correct knowledge and understanding about environmental education to have sustainable value concerning the environment as well as develop these students' capability in providing learning activities on environmental education for the better education. Therefore, the researchers conduct this research in order to gain the information for further development of an appropriate approach of environmental education.

Purposes of the study

1) to study the environmental context of schools according to curriculum, policy and action plan;

2) to study strategies and procedures in providing environmental education activities;

3) to study problems and suggestions in practice of environmental education; and

4) to suggest the guidelines for suitable environmental education process for Thai schools context

Method

Focus group interview was used in this study for a sample of 20 schools from elementary, expanded opportunity, and secondary schools of Khon Kaen, Mahasarakarm, Roi-Ed, and Kalasin provinces. Key informants were 100 teachers and 140 students. Instruments used in this study were interview checklist and digital camera. Content analysis was used to analyze data

Results

Frequency and percentage of school activities indicated the environmental context about curriculum, policy and action plans of schools were shown in Table 1-Table 4 while Table 5 was s uggestions of teachers and students about management of environmental activities in schools.

Table 1. Frequency and percentage of schools activities on environment reported by groups of informants (20 schools)

Item	Schools activities	Groups of informants	
		Teachers	Students
1	School based curriculum (Mainly infuse in science, social sciences, physical education and hygienic education)	100(20)	100(20)
2	Vision of school about environment	30(6)	30(6)
3	Policy of school about environment	75(15)	75(15)
4	Congruency of action plans and environment	70(14)	70(14)
5	Suitable environment for learning	95(19)	85(17)
6	Local learning resources	75(15)	80(16)
7	Lesson plan and instructional media on environment	75(15)	95(19)
8	SWOT Analysis	20(4)	0

Table 2. Percentage of environmental project initiated by groups

Rank	Environmental project	%
1	Initiated by teachers	45
2	Initiated by students	30
3	Initiated by community	25
	Total	100

Table 3. Percentage of environmental activities reported by groups of informants

Category	Activity	Groups of informants	
		Teachers	Students
1	Boys and girls scout	5	20
2	Clubs	10	15
3	Projects	45	30
4	Learning activities	35	25
5	Students' projects	5	10
	Total	100	100

Table 4. Percentage of teachers and students opinions about problems dealing with environmental activities

No.	Problems	Groups of informants	
		Teachers	Students
1	A lack of knowledge on environment	25	5
2	A lack of collaboration	10	25
3	A lack of financial allocation	25	25
4	A lack of instructional materials	10	10
5	A lack of learning resources	0	5
6	A lack of experts	0	5
7	Learning activities	0	10
8	A lack of awareness	10	5
9	A lack of continuity of policy	10	0
10	A lack of support organization	5	0
11	Others	5	10
	Total	100	100

Table 5 Suggestions of teachers and students about management of environmental activities in schools

No.	Issues	Groups of informants	
		Teachers	Students
1	School should provide a subject in environmental education	10	5
2	Learning activities on environmental education should be multidisciplinary integration	15	10
3	School policy should address clearly about environmental education	25	10
4	School should develop suitable environment for learning activities on environment	5	35
5	School should use various media to communicate and announce about environmental education	15	15
6	SWOT analysis should be used on environmental education	5	0
7	School should provide more activities on awareness toward environment	10	25
8	School should allocate money for environmental education	5	0
9	School administrators should pay much attention in management of environmental education	10	0
	Total	100	100

Conclusions

Seven guidelines for the suitable environmental education process for Thai schools context were 1) environmental issues should be addressed in a vision of school-based curriculum, 2) environmental education should be indicated in school policy and action plan, 3) student-centered and integration instruction using community resource should be used in providing learning activities, 4) enhancement of self-directed improvement of teachers' awareness toward environmental activities by providing a workshop and promotion of cooperation among stakeholders in school, 5) providing activities to develop the desired characteristics of the students and empowerment the students to launch the environmental projects by themselves, 6) physical environment of school should be decorated to be learning

resource, and 7) a school superintendent should allocate personnel, time, money, and continuous support for environmental projects.

It seems to me that Thai teachers had an appropriate environmental knowledge and awareness towards the environment. So the ways they taught should foster the children a good behavior towards the environment. However, in a knowledge-based society, a new approach of education system must prepare a learner in a multi-disciplinary ways of thinking to ensure more sound problem-solving based on integration of individual ability to related issues. The university as a high quality human resource is responsible to increase awareness, knowledge, technologies and tools to enhance and instill a more environmentally sustainable future. It should also promote changes in attitude, perspectives and behaviors that might help solving existing environmental problems and to avoid creating a new environmental problem (Farmer, 2000).

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A survey research of satisfaction levels of graduate students enrolled in a nationally ranked top-10 program at a mid-western university

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Abstract

The purpose of this study was to determine the satisfaction level of existing master's students attending a two-week summer session towards the same master's program in education with specializations in career and human resources education. Increased competition, dynamic educational environment, challenges such as budget cut, higher costs in obtaining college education, changing demographics in the population, declining enrollments, and a general public call for accountability have educational institutions realize the importance of student satisfaction (Cheng & Tam, 1997; Kotler & Fox, 1995). A survey research design was utilized to carry out this study. Findings indicate the majority of the students were either satisfied or extremely satisfied with the department's master's program.

Keywords: Student Satisfaction, Survey Research, Career and Human Resources Education

Introduction

The introduction of performance-based policies in the United States requires that higher educational systems to be more accountable. For instance, state systems are now putting policies in place to obligate state educational institutions to provide data and evidence to show that they are offering quality education and education-related activities to students in an effective and efficient manner (Hatcher, Prus and Fitzgerald,1992; Redd, 1998).

Student outcomes, student retention, attrition, and graduate rates are some of the key measures of the quality and overall effectiveness of the higher educational institution (Hatcher, et al., 1992; Redd, 1998). The implementation of these policies provides incentives and encouragement for higher educational institutions to study factors that affect the quality and overall effectiveness of their programs. Student satisfaction level has been found to be one of the factors that affects the quality and overall effectiveness of a university program (Aitken, 1982; Astin, Korn, & Green, 1987; Bailey, Bauman, & Lata, 1998; Love, 1993; Suen, 1983). In addition, student recruitment and retention have always been the core activities of higher educational institutions. Student satisfaction has been identified a factor that affects student recruitment and retention (Hatcher, et al., 1992; Love, 1993). This basically implies that the higher the level of satisfaction with the educational environment, the higher the likelihood that the student will stay at the educational institution and recommend the institution to others. As a result, student satisfaction has been integrated as a part of the discussion in respect of

institutional effectiveness and student outcomes (Astin, Korn, & Green, 1987; Bailey, Bauman, & Lata, 1998).

Problem Statement

Increased competition, dynamic educational environment, challenges such as budget cut, higher costs in obtaining college education, changing demographics in the population, declining enrollments, and a general public call for accountability have educational institutions realize the importance of student satisfaction (Cheng & Tam, 1997; Kotler & Fox, 1995). Studies have shown student satisfaction to have a positive impact on student motivation, student retention, recruiting efforts and fundraising (Borden, 1995; Frazer, 1999).

The students' positive feeling and satisfaction is contingent to the students' academic and social experiences obtained at the particular institution (Aitken, 1982; Betz, Menne, Starr, & Klingensmith, 1971; Danielson, 1998; Hatcher, et al., 1992; Stikes 1984; Tinto, 1993). However, most student studies in higher education focus more on intrinsic factors of student motivation. It is assumed that students who join graduate school are more highly motivated than college students and so attrition rates are lower in graduate schools (Suhre, Jansen & Harskamp, 2006). As a result, student satisfaction among graduate students is assumed and only usually considered when competition affects enrolment. There is need for more research in higher education that focuses more on student needs and concerns for the purposes of improving academic programs. In addition, extrinsic factors need to be considered as well.

Being able to identify and address students' needs and expectations allows educational institutions to attract and retain quality students as well as improve the quality of their programs (Elliott & Shin, 2002). Therefore, it is vital for educational institutions to determine and deliver what is important to students. Therefore, the purpose of this study is to determine the satisfaction level of existing departmental Master's students attending the two-week summer session.

Research Questions

To achieve the purpose of this study, the following questions need to be addressed.

1. What personal demographics characterize current career and human resources education graduate students attending the two-week summer session?
2. What geographic area is represented by the current career and human resources education graduate students attending the two-week summer session?
3. What is the overall career and human resources education satisfaction level of all graduate students attending the two-week summer session?
4. What is the overall career and human resources education satisfaction level of graduate students enrolled in the off-campus course delivery program attending the two-week summer session?
5. What is the overall career and human resources education satisfaction level of graduate students enrolled in the on-campus course delivery program attending the two-week summer session?
6. To what extent does specific Graduate Program characteristics contribute to the satisfaction level of all graduate students attending the two-week summer session?

7. To what extent do specific Graduate Program characteristics contribute to the satisfaction level of graduate students enrolled in the off-campus course delivery program attending the two-week summer session?
8. To what extent do specific Graduate Program characteristics contribute to the satisfaction level of graduate students enrolled in the on-campus course delivery program attending the two-week summer session?
9. To what extent are the specific career and human resources education characteristic related to overall program satisfaction/dissatisfaction level of all graduate students attending the two-week summer session?
10. To what extent are the specific career and human resources education characteristics related to overall program satisfaction/dissatisfaction level of graduate students enrolled in the off-campus course delivery program attending the two-week summer session?
11. To what extent are the specific career and human resources education characteristics related to overall program satisfaction/dissatisfaction level of graduate students enrolled in the on-campus course delivery program attending the two-week summer session?

Significance of the Study

First, the staff and the director of the career and human resources education can integrate the results and findings of the study in the retention strategies through necessary modification and improvement of the master's program to meet the needs and concerns [as indicated in the results of the study] of the current students who are enrolled in 2-week summer program. Moreover, the results of this study can also be used to assist in marketing the career and human resources education graduate program to prospective students and their families. Last, but not least, this study adds to the importance of how student satisfaction assessment can be utilized as a tool to ensure the program's quality and effectiveness.

Limitations and Delimitations

Limitations always exist in any study. In particular, this study has two limitations. First of all, the use of a convenient sample limits the generalizability of the results and findings of the study. In addition, the absence of random sampling does not permit the analysis of the data collected using inferential statistics. For the delimitations, this study only surveyed Master's students who are enrolled in the 2-week summer program in 2008 in the Career and Human Resources Educationdepartment in a nationally ranked Top-10 program at a mid-western university.

Review of Literature

Student satisfaction refers to the attraction, pride, or positive feeling that the students develop toward the program or institution (Danielson, 1998; Hatcher, et al., 1992). Strike (1984) indicated that the level of students' positive feeling or satisfaction is associated with students' being able to find adequate resources to meet their academic and social interests. The students' ability to project and implement their self concepts as a students or viewing themselves as part of the institution is also related to their positive feeling of satisfaction (Sedlacek, 1987; Stikes, 1984). The students' positive feeling and satisfaction is also contingent to the students' academic

and social experiences obtained at the particular institution (Aitken, 1982; Betz, Menne, Starr, & Klingensmith, 1971; Danielson, 1998; Hatcher, et al., 1992; Stikes 1984; Tinto, 1993). The academic and social experiences of students are the vehicles that drive students into the life of the institution (Tinto, 1993). In his Interaction theory into argues that student persistence can be predicted by their degree of integration. He refers to two kinds of integration; academic and social integration. Academic integration refers to how students perform academically (grades) and social integration is how the students interact with faculty (Suhre, Jansen, and Harskamp, 2006).

Previous studies have shown that students who report positive academic and social experiences expressed greater satisfaction with their overall college experience (Bailey, et al., 1998; Danielson, 1998; Tinto, 1993). Other key determinants of student satisfaction include academic performance, quality of curriculum, quality of instruction, quality of academic advising, student satisfaction with major, and the level of isolation felt by the student (Aitken, 1982). Interaction between faculty members and students is also a factor affecting student satisfaction in their academic experiences (Allen, 1987; Betz, et al., 1971; Love, 1993; Tinto, 1993). This implies that sufficient and positive faculty-student interaction will contribute to overall student satisfaction (Danielson, 1998; Nettles, et al., 1986; Tinto, 1993). Interaction with fellow students is also associated with student satisfaction (Aitken, 1982).

Research Methods

This study is a descriptive research study using survey method. The population included all the Master's students in the department of career and human resources education; about 243 students. The 86 students enrolled in the 2-week career and human resources education Master's program of summer, 2008 are the sample chosen for this study.

A convenient sampling design was used in this study. This means that no random sampling or assignment was performed. Convenient sampling was used because of the time constraints imposed on this study, the researchers had only one week to collect the data. The sample frame was specified as all students enrolled in the 2-week career and human resources education Master's program of summer, 2008. However, not all those enrolled were career and human resources education Masters students, some were from other departments taking career and human resources education summer courses as electives. The non- career and human resources education student responses were not considered and together with those who were absent or had dropped the courses, they totaled up to 29 students. The sampling units or those whose responses were considered in the study were 57 career and human resources education graduate students enrolled in the 2-week career and human resources education Master's program of summer, 2008.

In terms of sample characteristics, there were 57 career and human resources education students enrolled in the 2-week career and human resources education Master's program of summer, 2008. Of the 57 students, 34 were classified as non-traditional. Non-traditional students enroll into the career and human resources education Master's degree through the off-campus degree program. If they are local (in-state) residents, then they must attend one (1) two-week summer session on campus and will not attend campus courses in either the fall or spring semester. If they are not local residents, they must attend two (2) two-week summer sessions on campus and will not attend campus courses in either the fall or spring semester. The remaining 23 students were classified as traditional students.

In this study, traditional students were defined as students who enroll into the career and human resources education Master's degree through the on-campus degree program. For convenience, they attend the summer two-week session in addition to attending courses on campus in either or both the fall and spring semester.

Instrument

A 5-point Likert-type scale questionnaire was used as a data collection instrument in order to obtain student attitudes toward different characteristics. The questionnaire was divided into three main sections. The first section which contained only one item which asked participants to rate their overall satisfaction of the career and human resources education Master's program. The second section asked participants to rate their overall satisfaction on 14 different items. The forced choice statements presented were in order of Extremely Satisfied, Satisfied, Somewhat Satisfied, Unsatisfied and Extremely Unsatisfied. The last section asked participants to provide their demographic information.

Instrument validity and reliability

The instrument developed by the career and human resources education[with slight modification] was used to collect the data. The modification included adding two extra questions to the second section, and the omission of "ethnicity and race" in the demographic section. Appropriate permission was elicited and granted to use the instrument with this slight modification. To establish the validity of the instrument, the career and human resources education conducted a review of literature and utilized a penal of experts to generate the items found in this instrument. In addition, the focus groups and pilot studies were performed in order to establish the reliability of the instrument. In addition, the instrument was reviewed by another panel of researchers before it was distributed to the subjects. As a result, the validity and reliability of this instrument were established.

Data collection process

After resuming from class break, the researchers explained the nature of the survey and how the results were going to be used. The participants were invited to participate in the survey and were told that it would take only 10 to 15 minutes to fill out the questionnaire. It was emphasized that their participation was voluntary and their responses would be kept unanimous and confidential. Before the informed consent and questionnaire were handed to the participants, the participants were told that should they wish not to participate in the survey, they did not have to sign the informed consent nor fill out the questionnaire.

Data analysis

SPSS Version 14.0 was used to perform the analyses to addresses the research questions. Data analyses included descriptive statistics and a Spearman's *rho* correlation. Descriptive statistics included measurements of frequencies, percentages, means, and standard deviations. The Spearman's *rho* correlation showed the degree to which subjects maintained the same relative position on two measures (McMillan & Schumacher, 2006). A Likert-type scale

falls within the ordinal level of measurement (Jamieson, 2004). That is, response categories have a rank order, but the intervals between the values can not be equal. Therefore, the appropriate statistics for ordinal data are nonparametric tests such as Spearman's *rho* correlation (Jamieson, 2004, p. 1217). The correlations are reported in isolation of all other related variables.

This team of researchers are aware that the aspects of a graduate program are correlated amongst themselves and that multiple regression would have been a better method to account for the shared relationships; however, the sample size was too small to run multiple regression analysis. As a result, the *rho* and *p* values computed may not accurately reflect the relationship between all of the aspects of the career and human resources education department and overall program satisfaction due to shared variability and inflated type I error. The alpha level of .05 was predetermined for this study. The following section presents respondent data and results according to eleven research questions.

Findings

Research question 1: what personal demographics characterize current career and human resources education graduate students attending the two-week summer session?

Data for Research Question 1 were analyzed via descriptive statistics. As reflected in Table 1, the ages of the respondents' ranged from 22 years old to 54 years old. The mean of the respondents' ages was 35.33, with a standard deviation of 9.59.

Table 2 contains other demographic characteristics of the respondents. All 57 of the respondents declared career and human resources education as their major. Of the respondents, 30 (52.6%) were female, 27 (47.4%) were male, 29 (51.8%) were single and 27 (48.2%) were married. Twenty-three (40.4%) were identified as traditional students (defined by taking courses on campus year-around), 19 (33.3%) were identified as non-traditional students attending first summer session, and 15 (26.3%) were identified as non-traditional students attending second summer session. The majority of students (62.5%) are either into their first or second year of the graduate program. Twenty-six (48.1%) of the students reported a 4.0 grade point average (GPA).

Research question 2: what geographic area is represented by the current career and human resources education graduate students attending the two-week summer session?

Data for Research question 2 was calculated in miles from a mid-western university campus area code and is presented in Table 3.

Research question 3: what is the overall career and human resources education satisfaction level of all graduate students attending the two-week summer session?

Of the 55 respondents, 15 (27.3%) were Extremely Satisfied, 30 (54.5%) were Satisfied, 9 (16.4%) were Somewhat Satisfied, and 1 (1.8%) was Extremely Unsatisfied.

Research question 4: what is the overall career and human resources education satisfaction level of graduate students enrolled in the off-campus course delivery program attending the two-week summer session?

Of the 32 respondents, 10 (31.3%) were Extremely Satisfied, 14 (43.8%) were Satisfied, 7 (21.9%) were Somewhat Satisfied, and 1 (3.1%) was Extremely Unsatisfied.

Research question 5: what is the overall career and human resources education satisfaction level of graduate students enrolled in the on-campus course delivery program attending the two-week summer session?

Of the 23 respondents, 5 (21.7%) were Extremely Satisfied, 16 (69.6%) were Satisfied, and 2 (8.7%) were Somewhat Satisfied.

Research Question 6: to what extent does specific career and human resources education characteristics contribute to the satisfaction level of all graduate students attending the two-week summer session?

Research Question 7: to what extent do specific career and human resources education characteristics (listed above) contribute to the satisfaction level of graduate students enrolled in the off-campus course delivery program attending the two-week summer session?

Research Question 8: to what extent do specific career and human resources education characteristics (listed above) contribute to the satisfaction level of graduate students enrolled in the on-campus course delivery program attending the two-week summer session?

Research Question 6, 7, and 8 defined specific characteristics of the Career and Human Resources EducationDepartment that contributed to the Graduate Program. More specifically, 14 characteristics were identified that were particular to the two-week summer session. The results of the analysis are presented in Table 4.

Research question 9: to what extent are the specific career and human resources education characteristic(listed above)related to overall program satisfaction/dissatisfaction level of all graduate students attending the two-week summer session?

Research question 10: to what extent are the specific career and human resources education characteristics(listed above) related to overall program satisfaction/dissatisfaction level of graduate students enrolled in the off-campus course delivery program attending the two-week summer session?

Research question 11: to what extent are the specific career and human resources education characteristics(listed above) related to overall program satisfaction/dissatisfaction level of graduate students enrolled in the on-campus course delivery program attending the two-week summer session?

The purpose of Research Questions 9, 10, and 11 was to examine the relationship of respondents' overall program satisfaction to the 14 characteristics associated with the two-week

summer session using Spearman's *rho* correlation. Results of the analysis are presented in Tables 5, 6, and 7.

Table 1
Age of Respondents

Characteristic	*n*	*M*	*sd*	Min	Max
Age	57	35.33	9.587	22	54

Table 2
Demographic Characteristics of Respondents

Characteristics	Frequency	Percent
Major *(n = 57)*		
career and human resources education	57	100
Gender *(n = 57)*		
Female	30	52.6
Male	27	47.4
Marital Status *(n = 56)*		
Single	29	51.8
Married	27	48.2
Student Status *(n = 57)*		
Traditional student	23	40.4
Non-traditional attending 1st summer	19	33.3
Non-traditional attending 2nd summer	15	26.3
Years completed so far in Program *(n = 48)*		
1st semester (0.0)	4	8.3
One-half year (0.5)	9	18.8
One year (1.0)	20	41.7
One and half year (1.5)	3	6.3
Two years (2.0)	10	20.8
Two and half year (2.5)	1	2.1
Three years (3.0)	1	2.1
Current Grade Point Average Range *(n = 57)*		
3.0 – 3.4	10	18.7
3.5 – 3.91	18	33.2
4.0	26	48.1

Table 3
Miles from a mid-western university area code (N=57)

Characteristic	*n*	*M*	*sd*	Median	Max	Min
Miles from area code	51	266	409	65	1812	0
Range				Freq	Percent	
0				14	27.5	
7 - 22				10	19.7	
55 - 85				7	14.0	
165 - 520				11	21.9	
675 - 996				7	14.0	
1500 - 1800				2	04.0	

Table 4
Specific characteristics of the Career and Human Resources Education Department

Characteristic and Student Status	*n*	Extremely Satisfied	Satisfied	Somewhat Satisfied	Unsatisfied	Extremely Unsatisfied
Admission Procedures						
All graduate students	57	20(35.1)	29(50.9)	4(7.0)	4(7.0)	0
Non-traditional students	34	10(29.4)	19(55.9)	2(5.9)	3(8.8)	0
Traditional students	23	10(43.5)	10(43.5)	2(8.7)	1(4.3)	0
Faculty Members in Career and Human Resources Education Department						
All graduate students	57	29(50.9)	23(40.4)	4(7.0)	1(1.8)	0
Non-traditional students	34	21(61.8)	11(32.4)	1(2.9)	1(2.9)	0
Traditional students	23	8(34.8)	12(52.2)	3(13.0)	0	0
Course Offered in Career and Human Resources Education Department						
All graduate students	57	21(36.8)	27(47.4)	7(12.3)	1(1.8)	1(1.8)
Non-traditional students	34	13(38.2)	16(47.1)	3(8.8)	1(2.9)	1(2.9)
Traditional students	23	8(34.8)	11(47.8)	4(17.4)	0	0
Program Advisement						
All graduate students	57	9(15.8)	27(47.4)	10(17.5)	6(10.5)	5(8.8)
Non-traditional students	34	6(17.6)	17(50.0)	4(11.8)	3(8.8)	4(11.8)
Traditional students	23	3(13)	10(43.5)	6(26.1)	3(13.0)	1(4.3)
Other students in Career and Human Resources Education Graduate Program						
All graduate students	56	23(41.1)	25(44.6)	5(8.9)	3(5.4)	0
Non-traditional students	34	15(44.1)	16(47.1)	3(8.8)	0	0
Traditional students	22	8(36.4)	9(40.9)	2(9.1)	3(13.6)	0

Note. *n* = responses (percentage)

Table 4 (continued)

Characteristic and Student Status	*n*	Extremely Satisfied	Satisfied	Somewhat Satisfied	Unsatisfied	Extremely Unsatisfied
Your interaction with faculty in the Career and Human Resources Education Department						
All graduate students	57	28(49.1)	21(36.8)	8(14)	0	0
Non-traditional students	34	18(52.9)	11(32.4)	5(14.7)	0	0
Traditional students	23	10(43.5)	10(43.5)	3(13.0)	0	0
Networking opportunities among faculty and students						
All graduate students	57	19(33.3)	23(40.4)	13(22.8)	1(1.8)	1(1.8)
Non-traditional students	34	10(29.4)	15(44.1)	8(23.5)	0	1(2.9)
Traditional students	23	9(39.1)	8(34.8)	5(21.7)	1(4.3)	0
Communications within Career and Human Resources Education Department and with students						
All graduate students	57	20(35.1)	27(47.4)	5(8.8)	3(5.3)	2(3.5)
Non-traditional students	34	10(29.4)	15(44.1)	4(11.8)	3(8.8)	2(5.9)
Traditional students	23	10(43.5)	12(52.2)	1(4.3)	0	0
Career and Human Resources Ed costs						
All graduate students	56	11(19.6)	23(41.1)	16(28.6)	4(7.1)	2(3.6)
Non-traditional students	34	7(20.6)	10(29.4)	14(41.2)	1(2.9)	2(5.9)
Traditional students	22	4(18.2)	13(59.1)	2(9.1)	3(13.6)	0
Distribution of courses delivered by distance						
All graduate students	54	12(22.2)	22(40.7)	14(25.9)	5(9.3)	1(1.9)
Non-traditional students	34	8(24.2)	13(39.4)	8(24.2)	4(12.1)	0
Traditional students	21	4(19.0)	9(42.9)	6(28.6)	1(4.8)	1(4.8)

Note. *n* = responses (percentage)

Table 4 (continued)

Characteristic and Student Status	*n*	Extremely Satisfied	Satisfied	Somewhat Satisfied	Unsatisfied	Extremely Unsatisfied
Preparation for your desired career goal/position						
All graduate students	57	17(29.8)	31(54.4)	6(10.5)	3(5.3)	0
Non-traditional students	34	10(29.4)	18(52.9)	5(14.7)	1(2.9)	0
Traditional students	23	7(30.4)	13(56.5)	1(4.3)	2(8.7)	0
reparation for a PhD program						
All graduate students	50	10(20.0)	24(48.0)	12(24.0)	4(8.0)	0
Non-traditional students	32	7(21.9)	12(37.5)	9(28.1)	4(12.5)	0
Traditional students	18	3(16.7)	12(66.7)	3(16.7)	0	0
eputation of MS Career and Human esources Education Program						
All graduate students	57	25(43.9)	27(47.4)	4(7.0)	1(1.8)	0
Non-traditional students	34	18(52.9)	13(38.2)	2(5.9)	1(2.9)	0
Traditional students	23	7(30.4)	14(60.9)	2(8.7)	0	0
eputation of *School of Study*						
All graduate students	57	20(35.1)	27(47.4)	9(15.8)	1(1.8)	0
Non-traditional students	34	14(41.2)	16(47.1)	3(8.8)	1(2.9)	0
Traditional students	23	6(26.1)	11(47.8)	6(26.1)	0	0

ote. *n* = responses (percentage)

Table 5
Spearman Correlation between Overall Program Satisfaction level of all graduat students attending the two-week summer session and characteristics of the Career and Human Resources Education Graduate Department

Characteristic	*n*	*rho*
Preparation for your desired career goal/position	55	.635**
Courses offered in the Career and Human Resources Education Department	55	.619**
Program advisement	55	.593**
Reputation of MS Career and Human Resources Education Program	55	.505**
career and human resources education costs	54	.482**
Other students in career and human resources education	54	.473**
Networking opportunities among faculty and students	55	.443**
Preparation for a PhD program	49	.430**
Communication within Career and Human Resources Education Department and with students	55	.418**
Your interaction with faculty in the Career and Human Resources Education Department	55	.415**
Faculty members in the Career and Human Resources Education Department	55	.399**
Reputation of *School of Study*	55	.312*
Distribution of courses delivered by distance	52	.260
Admission procedures	55	.249

Note. $*p < .05$. $**p < .01$.

Table 6
Spearman Correlation between Overall Program Satisfaction level of graduate students enrolled in the off-campus course delivery program attending the two-week summer session and characteristics of the Career and Human Resources Education Graduate Department

Characteristic	*n*	*rho*
Courses offered in the Career and Human Resources Education Department	32	.697**
Program advisement	32	.683**
Preparation for your desired career goal/position	32	.683**
Communication within Career and Human Resources Education Department and with students	32	.605**
Career and human resources education costs	32	.583**
Reputation of MS Career and Human Resources Education Program	32	.543**
Networking opportunities among faculty and students	32	.540**
Other students in career and human resources education	32	.519**

Note. $*p < .05$. $**p < .01$.

Table 6 (continued)

Characteristic	*n*	*rho*
Your interaction with faculty in the Career and Human Resources Education Department	32	.514**
Faculty members in the Career and Human Resources Education Department	32	.501**
Preparation for a PhD program	31	.406*
Admission procedures	32	.327
Reputation of *School of Study*	32	.239
Distribution of courses delivered by distance	31	.197

Note. *$p < .05$. **$p < .01$.

Table 7

Spearman Correlation between Overall Program Satisfaction level graduate students enrolled in the on-campus course delivery program attending the two-week summer session and characteristics of the Career and Human Resources Education Graduate Department.

Characteristic	*n*	*rho*
Preparation for your desired career goal/position	23	.548**
Courses offered in the Career and Human Resources Education Department	23	.486*
Reputation of *School of Study*	23	.471*
Reputation of MS Career and Human Resources Education Program	23	.448*
Other students in career and human resources education	22	.445*
Preparation for a PhD program	18	.430
Program advisement	23	.424*
Distribution of courses delivered by distance	21	.389
Faculty members in the Career and Human Resources Education Department	23	.279
Networking opportunities among faculty and students	23	.257
Your interaction with faculty in the Career and Human Resources Education Department	23	.218
Career and human resources education costs	22	.178
Admission procedures	23	.106
Communication within Career and Human Resources Education Department and with students	23	-.032

Note. *$p < .05$. **$p < .01$.

Conclusions

The purpose of this study was to determine the satisfaction level of existing Career and Human Resources Education Master's students attending the 2008 two-week summer session. More specifically the study (a) compiled a demographic profile, (b) determined the level of satisfaction with characteristics particular to the career and human resources education graduate

program, and (c) measured their degree of satisfaction regarding overall satisfaction with the career and human resources education graduate program.

Demographic Profile

Respondents' age ranged from 22 to 54 with a mean of 35 years old. The career and human resources education is more desirable for persons of maturity or otherwise known as non-traditional students (meaning upper age), which is typical of the type of students who enroll graduate school. Students who are admitted into the career and human resources education must have completed at least two years of work experience; this may be an additionally reason for the age of students enrolled in this program.

The majority of students reside at least 55 miles from the *School of Study* campus. The dedication of time off away work, away from family, and the financial burden of room and board for the two weeks is a testament of their commitment and need for this graduate degree.

The 2008 summer session was designed for the non-traditional students which were reported as the majority (59.6%) in this present study. A non-traditional student was defined as a student enrolled in the off-campus degree program (OCDP). As a requirement, students residing outside of Illinois must commit to two summers of on- campus (*School of Study*) instruction, while in-state residents must commit to attending for one summer. Therefore, the results are indicative of the program format.

Satisfaction of Characteristics

Of the 55 respondents, the majority were overall satisfied with the career and human resources education graduate program. However, the on-campus students and non-traditional students differ on their level of overall satisfaction. Of the 23 on-campus respondents' 91.3% were extremely satisfied or satisfied while 75.1% of the non-traditional students (n = 32) were extremely satisfied or satisfied.

The results continue with the differences between non-traditional students and on-campus students with regards to the satisfaction of characteristics of the career and human resources education graduate program. The non-traditional students were most satisfied with faculty members in the career and human resources education department while the on-campus students were most satisfied with communications within the career and human resources education Department and with students.

Overall Satisfaction with Characteristics

Both groups of students indicated the characteristics of career and human resources education does prepare you for your desired career/goal position, courses offered in the career and human resources education program, program advisement, and the reputation of the MS career and human resources education program contribute to the overall satisfaction level with the career and human resources education graduate program.

Interestingly, the reputation of *School of Study* by the on-campus students is moderately correlated while the off-campus has low correlation to overall satisfaction with the Wed graduate program.

The characteristics of communication within the Career and Human Resources Education Department and students, networking opportunities among faculty and students, interaction with faculty in the Career and Human Resources Education Department, and faculty members within the Career and Human Resources Education Department while these are moderately positive correlated among the non-traditional students, these characteristics ranked low among on-campus students.

Not surprisingly, the distribution of courses by distance was indicated as the lowest positive correlation with overall program satisfaction. This could be contributed to the limited number of online courses offered by the career and human resources education program.

Implications

The career and human resources education department should continue to market their program to experienced workers who want to further their education. The career and human resources education caters to two distinct groups of students (a) on-campus and (b) non-traditional students. This study proved that each group of students has different needs. The career and human resources education director, career and human resources education faculty, the career and human resources education chair need to focus on sustaining the characteristics with which each group of students are satisfied and develop a strategic plan to improve the characteristics with which they are dissatisfied. These characteristics should be communicated between and among graduate students, faculty, and administration.

The career and human resources education accommodates the needs of their students through the design of the program format. This study has allowed the stakeholders to pinpoint what each group (on-campus and non-traditional) of students need to be successful in obtaining their Master's degree. Not only current students needs need to be addressed but for the improvement of quality of the career and human resources education to attract and retain future students.

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Development of a Model of Organizational Effectiveness Evaluation for Faculties of Education

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Abstract

The objectives of the present research were: (1) to develop an effective evaluation model for faculties of education at higher education institutions in Thailand; (2) to study causal factors at the field and department levels for correlation and effect in effectiveness of faculties of education. A total of 1,024 samples were stratified randomly, and consisted 4 public autonomous universities and 4 public universities in Thailand. A five-point Likert scale was used to measure the developed instruments, with Cronbach's alphas ranging from 0.754 to 0.981. Statistical analyses were made based on descriptive statistics, and Pearson's product-moment correlation. Multilevel confirmatory factor analysis and multilevel causal model analysis were performed using Mplus. The model of organizational effectiveness was described by nine variables. The research results showed that the perceptions of members in faculties of education in public autonomous universities regarding faculty of education effectiveness were quite high for all variables, except for academic development, which was moderate. In the case of public universities, the perceptions of faculty members were quite high for all variables, except for the ability to acquire resources and money, which was moderate. The proposed multilevel causal model of faculty of education effectiveness fits quite well with the empirical data set (χ^2 = 92.210, df = 63, χ^2 / df = 1.464, CFI = 0.991, TLI = 0.974, RMSEA = 0.021, $SRMR_B$ = 0.012, $SRMR_W$ = 0.008). The predictor variables at the field and department levels accounted for variance of the faculty of education effectiveness of about 73% and 56%, respectively.

Keywords: Evaluation model, Faculty of education effectiveness

Introduction

In the higher education system in Thailand, faculties of education are the organizations that have the important role of producing and developing quality teachers. However state university application, out the idea that this occurred with the reform of education system in 1974, which set guidelines that institutions must be independent systems. The year 1991, the government announced policies to reign in government; choice for university is two ways to remain in office but need to change regulations to streamline efficiency and effectiveness. And more autonomous public universities will change is the same each university is free to manage more from the old to the University Affairs (Commission on Higher Education) has changed the

management of their own. University administrators have the power to decide the budget until the administration of academic personnel, autonomous public universities began a fact is more during the economic crisis of 1997 when the International Monetary Fund (IMF) and Asian Development Bank (ADB) because Thai government used over budget for education. This reason drive to the Thai government will have the education process, that explain the Thai government monetary and fiscal budget to support higher education unnecessarily on 27 January 1998 the cabinet approved the conditions of the loan from the ADB, which made it clear that all public universities needed to change their status either to "corporate university in the government" or "autonomous public university" by the year 2002.

For differentiate between public and autonomous public universities in Thailand's university system, autonomous public universities all must change management system within from existing government regulations is the same government is another self-management by the government to withdraw a supervised including those of universities are independent of management and personal finance by themselves fully and separate decisions and diagnosis and management from the same academic level focus on management of people in each class in the system and services, but separate missions. A dynamic financial system. After the financial audit has to be a sum (Block grant) and a legal guardian to provide maintenance benefits from the property, Necessary budget should be allocated.

Performance indicators allow an organization to achieve mission success by evaluating the effectiveness of the organization (Cherrington, 1994). But there are several problems in measuring and evaluating a faculty of education's effectiveness and efficiency. Stufflebeam et al. (1971), Katz and Kahn (1978), Goodman and Pennings (1980), Harrison (1994), and Price and Mueller (1986) determined that these problems included: (1) variables were not covered; (2) variables were too abstract; (3) indicators were not sufficient; (4) the weights of indicators were not suitable; (5) criteria were unclear; (6) analysis was not covered; (7) causal factors were not shown; and (8) models were not sufficient.

Limitations of past research in developing of a model of organizational effectiveness. First, the research methodology used in developing the model, regardless of realities, organization of the relationship between the levels in descending order, especially educational organization which could not determine the influence caused by variables in the level and how much of volume. Second, problems in selecting appropriate units of analysis are not made estimate the standard error is less than the true and tested statistically significant discrepancy of type 1 (type one error) over the set.

In this research multilevel causal analysis was used in the developed model with normative approach. This approach uses the principle of causal analysis and the actual state of the organization to define domain, and to develop a model for collecting data from stakeholders and other interested groups using modern evaluation techniques.

Objectives

1) To develop an effective evaluation model for faculties of education at higher education institutions in Thailand.

2) To study causal factors at both individual and field levels for correlation and effect in effectiveness of faculties of education.

Conceptual Frameworks

The meaning of the effectiveness of a faculty of education is defined as its successful operation in terms of awareness of the organizational missions by the administrator, faculty members, and support staff. The main missions include teaching, research, academic services to the community, and fostering arts and culture. Other missions are human development and exploration of an improved quality of life leading to a better, more peaceful society through educational reform and sustainable development of local communities. The researchers applied multilevel causal analysis with a normative approach for the developed model. This approach is based on the concept and principles of rational analysis of actual conditions, and an educational organization that has set the scope for developing a model study with relevant groups (stakeholders), or a system-wide evaluation of data from several groups (multi-group evaluators). Such approaches would be based on modern evaluations (Kanjanawasee, 2550) to study variables that apply to an organization's effectiveness (Steers, 1977; Birnbaum, 1992; Simmons, 1993; Judge, 1994; Gibson, lvancevich and Donnelly, 2000; LaRocco, 2003; and Rosser, Johnsrud and Heck, 2003) and use the concept of a multidimensional evaluation model (Cameron 1978, 1986; Clott, 1995; Kwan and Walker, 2003; Sowa, Selden and Sandfort, 2004) for developing the model and setting the weight score effectiveness of faculties of education at institutions of higher education in Thailand. These guidelines, as well as the Malcolm Baldrige National Quality Award (MBNQA), European Foundation for Quality Management (EFQM), and Balanced Scorecard (BSC), can be used to develop a framework of research ideas, as shown in Figure 1.

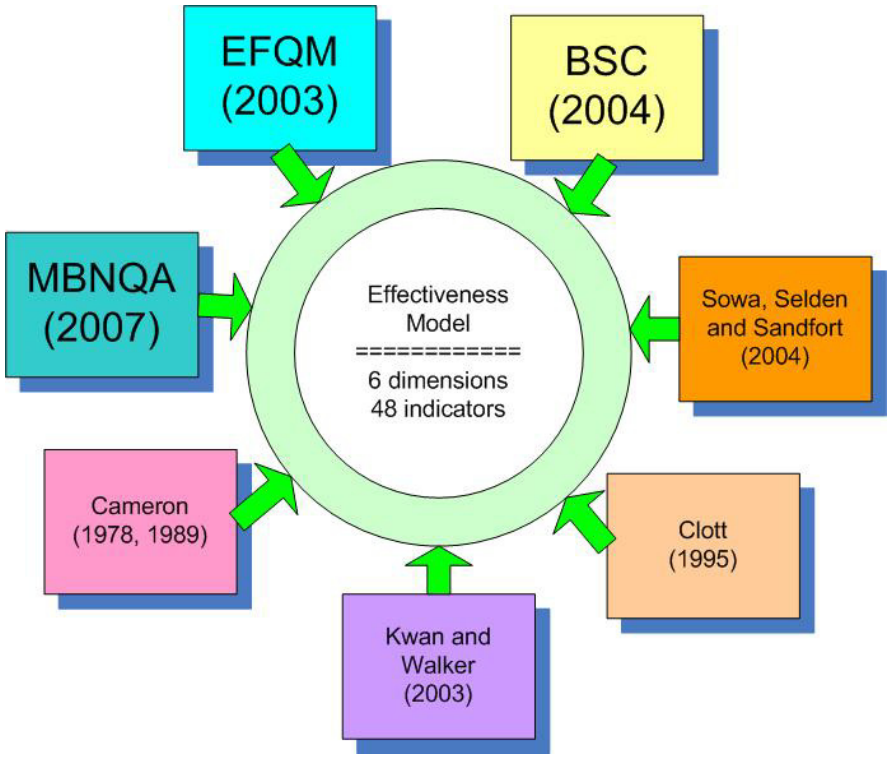

Figure 1: Conceptual framework for developed model

The conceptual framework for a multilevel causal analysis of faculty of education effectiveness displays 6 independent variables at the field and department levels, including: (1) educational satisfaction (ES); (2) academic development (AD); (3) faculty members' satisfaction (FMS); (4) professional development (PD); (5) system openness and community interaction (SOC); (6) ability to acquire resources and money (ARM). This is shown in Figure 2.

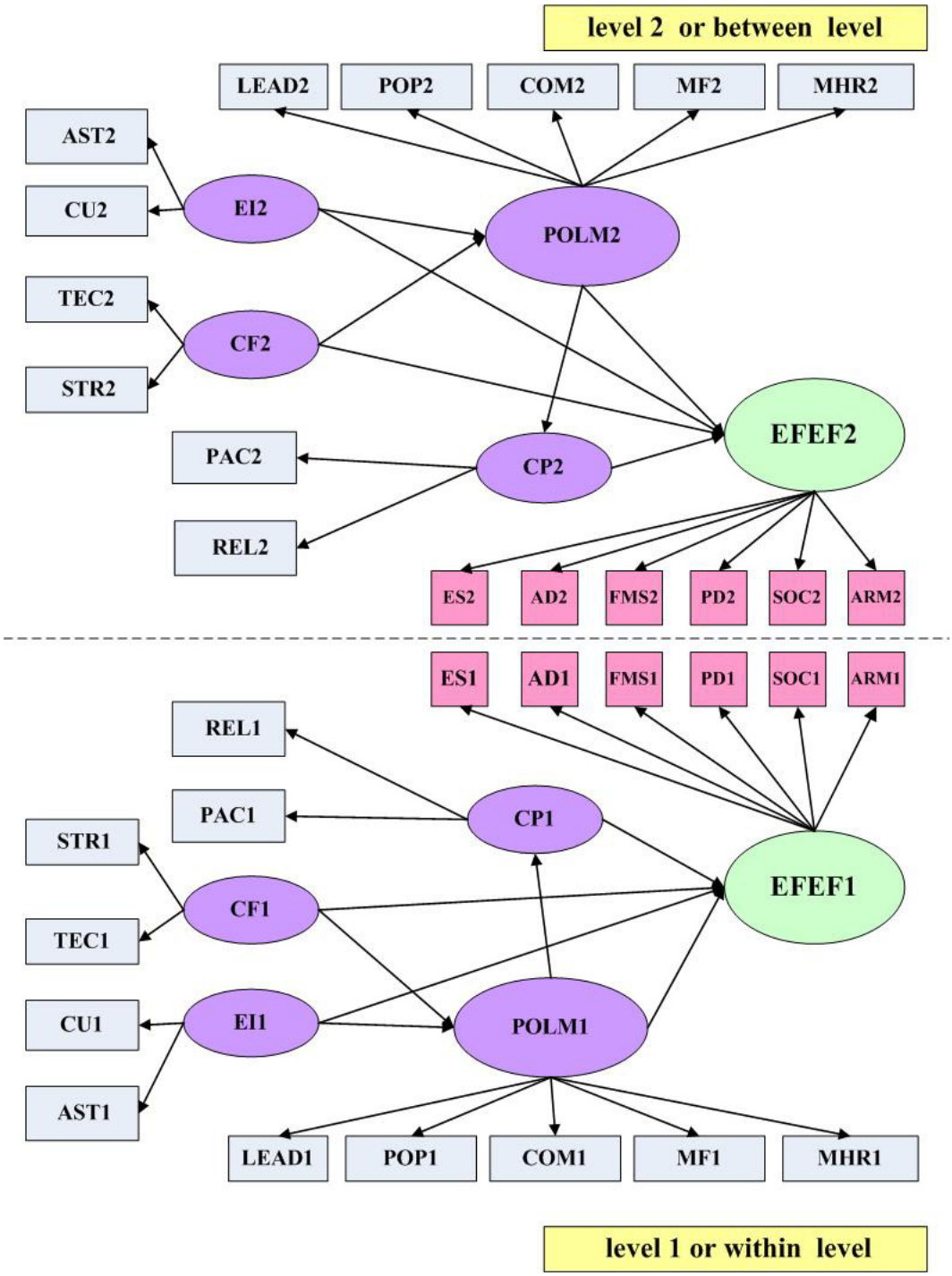

Figure 2: Conceptual framework for multilevel causal analysis

Methods

Procedure

Research and development that was used for the procedure consisted of two steps.

Step 1: Develop a conceptual framework, and a faculty of education effectiveness evaluation model based on: the MBNQA Excellence model; the EFQM Excellence model; the Balanced Scorecard model; the Cameron model; the Clott model; the Kwan and Walker model; and the Sowa, Selden and Sandfort model.

Step 2: Try out using the model with empirical data and test factors of multilevel causal analysis; check for conformation of variables in the effectiveness evaluation model; and reach a conclusion.

Participants

A total of 1,024 samples were stratified randomly, and consisted of 680 faculty members and 344 supporting staff from 4 public autonomous universities and 4 public universities in Thailand.

Instrumentation

In this study, a survey questionnaire was adopted as the research instrument. The researcher also interviewed some administrators of faculties of education in order to improve the quality of the questionnaire, which was divided into three sections, described briefly as follows:

Part 1: Demographic information – categorized questions about selected demographic variables: gender, education, academic position, work position, experience, number of research studies per year, and times of seminars. This part served as reference information for the study.

Part 2: Relationships and factors influencing the effectiveness of the disciplines of the faculty of education – a total of 100 items measured on a five-point Likert scale, with Cronbach's alphas ranging from 0.754 to 0.810.

Part 3: Effectiveness of education – 6 variables (a total of 48 items) measured on a five-point Likert scale, with Cronbach's alphas ranging from 0.799 to 0.981.

Statistics

Statistical analysis was conducted using SPSS 16.0 for Windows for analysis of Pearson's product-moment correlation. Multilevel confirmatory factor analysis and multilevel causal model analysis were performed using Mplus version 5.21.

Results

The research results showed that the perceptions of members of faculties of education in public autonomous universities towards the faculty of education's effectiveness were quite high for all variables, except for academic development, which was moderate. In the case of faculty members in public universities, perceptions were quite high for all variables except the ability to acquire resources and money, which was moderate. A comparison between the groups of

variables showed that faculty members' satisfaction and goal attainment were higher than the other variables, as shown in Table 1.

Table 1: A comparison of variables at public autonomous universities and public universities

Variables	MEAN	SD	CV%	MIN	MAX	SK	KU
Public autonomous universities (N = 500)							
1) Educational satisfaction (ES)	3.818	0.366	9.59	1.000	5.000	0.626	3.818
2) Academic development (AD)	3.114	0.387	12.43	1.000	5.000	1.498	4.039
3) Faculty members' satisfaction (FMS)	4.243	0.621	14.64	1.000	5.000	0.924	4.243
4) Professional development (PD)	3.767	0.609	16.17	1.000	5.000	0.182	3.767
5) System openness and community interaction (SOCI)	3.823	0.527	13.78	0.000	5.000	-0.509	3.823
6) Ability to acquire resources and money (ARM)	4.023	0.730	18.15	1.000	5.000	-0.555	3.133
Public universities (N = 524)							
1) Educational satisfaction (ES)	3.882	0.266	6.85	1.000	5.000	-0.565	3.882
2) Academic development (AD)	3.741	0.395	10.56	1.000	5.000	-0.787	4.071
3) Faculty members' satisfaction (FMS)	4.372	0.449	10.27	1.000	5.000	-1.148	4.372
4) Professional development (PD)	3.806	0.677	17.79	1.000	5.000	-0.047	3.806
5) System openness and community interaction (SOCI)	3.610	0.489	13.55	1.000	5.000	0.434	3.610
6) Ability to acquire resources and money (ARM)	3.171	0.462	14.57	1.000	5.000	0.324	3.604

Note 1. Public autonomous universities SE_{SK}= 0.009 SE_{KU}= 0.211 2. Public universities SE_{SK} = 0.120 SE_{KU}= 0.184

The proposed multilevel causal model of faculty of education effectiveness fits quite well with the empirical data set (χ^2 = 92.210, *df* = 63, χ^2 / *df* = 1.464, CFI = 0.991, TLI = 0.974, RMSEA = 0.021, $SRMR_B$ = 0.012, $SRMR_W$ = 0.008). Statistical analysis further showed that individual-level variables, such as management policy, and characteristics significantly affected the faculty members' perceptions of effectiveness. For field-level variables, only policy management of the unit was significant. The predictor variables at the field and department levels accounted for variance of effectiveness of about 73% and 56%, respectively (details shown in Table 2).

Table 2: Weighted values of the element indicators in the multilevel causal model of faculty of education effectiveness

Observed variables	Field-level (within groups: W)				Department-level (between groups: B)				Intraclass Variable Correlation (ICCs)	Intercepts or average group means
	β	SE	Z	R^2	β	SE	Z	R^2		
Measurement model of faculty of education effectiveness										
1) Educational satisfaction (ES)	0.793	0.308	3.876	0.504	0.818	0.101	8.068	0.670	0.594	3.910
2) Academic development (AD)	0.662	0.150	4.410	0.464	0.658	0.177	5.328	0603	0.438	4.434
3) Faculty members' satisfaction (FMS)	0.681	0.195	1.958	0.645	0.748	0.156	4.787	0.560	0.532	4.370
4) Professional development (PD)	0.637	0.360	3.491	0.688	0.611	0.295	2.053	0.597	0.459	4.057
5) System openness and community interaction (SOC)	0.631	0.187	2.765	0.609	0.697	0.158	4.421	0.486	0.549	3.758
6) Ability to acquire resources and money (ARM)	0.621	0.222	2.797	0.786	0.659	0.190	3.459	0.634	0.649	3.219
Measurement model of internal environment										
1) Atmosphere (AST)	0.994	-	-	0.544	0.537	-	-	0.737	0.005	4.221
2) Culture (CU)	0.237	-	-	0.445	0.651	-	-	0.531	0.031	5.528
Measurement model of characteristics										
1)Technology (TEC)	0.737	0.000	25.889	0.989	0.771	-	-	0.795	0.008	3.662
2) Structure (STR)	0.741	0.007	31.614	0.056	0.457	-	-	0.409	0.008	3.959
Measurement model of personnel										
1) Professional and academics (PAC)	0.623	-	-	0.641	0.417	-	-	0.740	0.031	5.170
2) Relationship (REL)	0.421	-	-	0.510	0.737	-	-	0.778	0.010	5.274
Measurement model of policy and management										
1) Leadership (LEAD)	0.523	0.018	1.230	0.641	0.814	0.054	21.007	0.713	0.001	4.087
2) Policy and planning (POP)	0.601	0.050	3.103	0.410	0.811	0.056	12.141	0.718	0.023	4.649
3) Communication (COM)	0.723	0.177	2.130	0.541	0.917	0.048	19.157	0.840	0.016	3.916
4) Management of	0.701	0.190	2.003	0.610	0.937	0.069	13.541	0.878	0.012	5.329

Observed variables	Field-level (within groups: W)				Department-level (between groups: B)				Intraclass Variable Correlation (ICCs)	Intercepts or average group means
	β	SE	Z	R^2	β	SE	Z	R^2		
finance (MF) 5) Management of human resource s (MHR)	0.601	0.150	2.803	0.520	0.717	0.109	12.541	0.678	0.002	4.197

χ^2 = 92.210, *df* = 63, χ^2 / *df* = 1.464, CFI = 0.991, TLI = 0.974, RMSEA = 0.021, $SRMR_B$ = 0.012, $SRMR_W$ = 0.008

(Mplus 5.21 standardized estimates)

R^2 of causal model faculty of education effectiveness (field-level) = 0.731

R^2 of causal model faculty of education effectiveness (department-level) = 0.562

Average cluster size = 36.704 Number of departments = 34

Conclusion

This research was to develop an effective evaluation model for faculties of education at institutions of higher education in Thailand. The validation model for faculties of education in public autonomous universities was quite high for all variables, except for academic development, which was moderate. But the perceptions of faculty members in public universities were quite high for all variables, except for the ability to acquire resources and money which was moderate. A comparison between groups of variables showed that the faculty members' satisfaction was critical variables (Cameron, 1978, 1986; Clott, 1995; Kwan and Walker, 2003; Sowa, Selden and Sandfort, 2004; Balanced Scorecard, 2004; European Foundation for Quality Management, 2006; and Malcolm Baldrige National Quality Award, 2007).

The proposed multilevel causal model of faculty of education effectiveness fits quite well with the empirical data set. Statistical analysis further showed that the individual-level variables, such as policy of management, and characteristics of faculty's member significantly affected the faculty members' perceptions of the faculty's effectiveness. In the case of field-level variables, only policy management of the unit was significant (Steer, 1977; Gibson, lvancevich and Donnelly, 2000). The predictor variables at the field and department levels accounted for variances of effectiveness of about 73% and 56%, respectively.

Acknowledgment

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How to improve knowledge transfer strategies and practices in education? Answers from a systematic literature review.

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Abstract

Building on the systematic review methodology, this paper aims to examine the knowledge transfer process in education and its main determinants in this specific context. Our findings suggest that linkage agents are central actors in the knowledge transfer process. Their intervention is critical to help adapt the knowledge produced by researchers and make it easier to adopt and use by practitioners. Moreover, the effectiveness of this process hinges on several factors that were broken down into three major categories: determinants related to transferred-knowledge attributes, those related to the actors involved in the process, and determinants related to transfer mechanisms.

Keywords: Knowledge transfer, Education, Linkage agents, Systematic review, Determinants

Introduction

Knowledge transfer is a major concern in improving educational practices (Huberman 1990; Love 1985; Willmott 1994). Actually, even if new information and communication technologies have made it much easier for practitioners to access research results, there is still a large gap between the knowledge produced by research providers and the one used in practice. Anderson (1992) attributes the reasons for this gap mainly to researchers who often allow much more interest, time, and effort to the production of new knowledge than to the dissemination of their research results. This then turns into a major barrier to the diffusion of research results to managers, policy-makers and practitioners. For other authors, the reasons of this gap are attributed to practitioners. Hence, the resistance of practitioners to adopt new knowledge (Kirst 2000) and their often limited competencies and skills (Hemsley-Brown and Oplatka 2005) are some of the main handicaps for the appropriation and application of research results. Whether the weakness is on the research side or the practice one, it's largely admitted that knowledge transfer between researchers and practitioners should be further encouraged and promoted since

it represents the only viable way to significantly reduce the gap between knowledge creation and knowledge use.

Drawing on the systematic review methodology, this paper aims to advance knowledge on knowledge transfer in education by investigating the typical process and the main determinants of the phenomenon in this particular context. The research findings should provide a better understanding of the knowledge transfer process in education, and enable evidence-based recommendations for researchers as well as for managers and policy-makers in order to improve knowledge transfer activities.

Theoretical Background

Several models of knowledge transfer and utilization have been proposed in the literature on education. Havelock's models (Havelock 1973) are probably the ones that laid foundations to the current theoretical developments in this field. These models have become broadly known with the works of Huberman (1983; 1990; 2002) and Huberman and Gather-thurler (1991). Several other models have been developed after Havelock's frameworks. According to Neville and Warren (1986), these models break down into four main groups: 1) the RDD (research, development, diffusion) models, 2) the problem-solving models, 3) the linkage models, and 4) the social interaction models.

RDD models focus on the advancement of knowledge as the most critical factor for research utilization (Hargreaves 1999; Havelock 1973; Neville and Warren 1986; Love 1985). They subscribe to a science push approach where the knowledge producer, mainly university researchers, is the central actor in the knowledge production and diffusion process. Within the problem-solving models' general framework, users are the principal initiators of change, since they are responsible for needs' identification and formulation (Havelock 1973; Neville and Warren 1986; Love 1985). The researcher is regarded as a "technician" that is solicited to respond to the users' needs (Love 1985). According to Havelock, as cited by Love (1985), there are five steps in a typical problem-solving model of knowledge transfer: 1) needs identification, 2) articulation of the problem, 3) search for solutions, 4) selection of the best solution, and 5) implementation of the retained solution to satisfy the need.

The linkage models integrate the concepts and premises of the two aforesaid ones. They emphasize the implementation of mechanisms to ensure formal linkages between knowledge producers and potential users (Huberman 2002; Neville and Warren 1986; Love 1985). Finally, the social interaction models emphasize knowledge diffusion between persons and systems (Cros 1997; Hargreaves 1999). According to this perspective, knowledge utilization is a result of repeated interactions between researchers and users (Havelock 1973; Huberman 2002). Users are then considered as co-producers of knowledge alongside with researchers (Hargreaves 1999).

As stated earlier, the objective of this paper is to investigate the knowledge transfer process and its determinants in the educational field. The exploration of these important issues requires a consideration of the four groups of models stated above. Hence, while answering our main question, one of the objectives of this study will be to assess the effectiveness of the theoretical frameworks so far proposed to support knowledge transfer in education, and eventually propose one that fits with the current needs and specificities of the education sector.

Methods

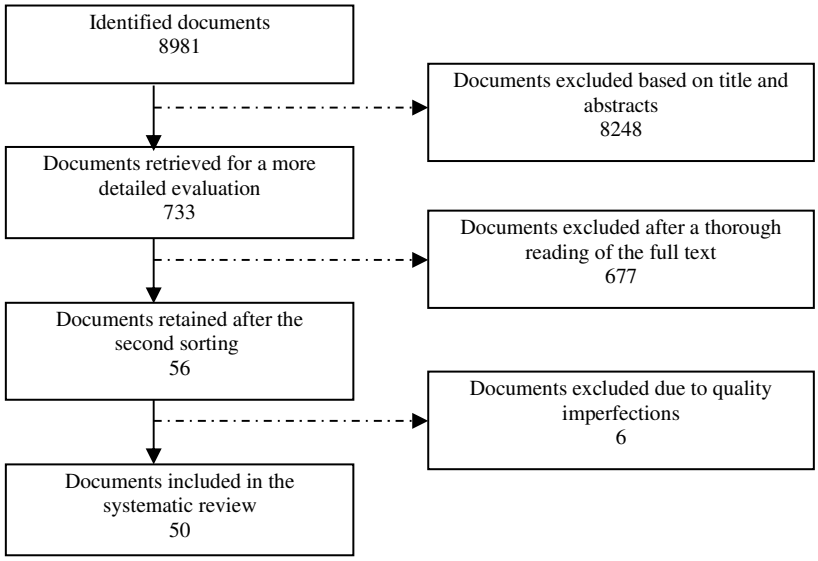
This paper uses a systematic review approach in order to investigate the knowledge transfer process and its determinants in education. A systematic review is a literature review following a rigorous, transparent and reproducible process, which aims to identify, select, appraise, analyze and synthesize, in a systematic and comprehensive way, research evidence on a specific research topic (Cook et al. 1997; Transfield et al. 2003; Moynihan 2004). Systematic reviews are nowadays widely considered as the least biased and the most rational way to synthesize research evidence, and a powerful tool to provide the best available knowledge for decision making (Fox 2005; Moynihan 2004). The basic steps for a systematic review include: 1) formulating an explicit research question, 2) fixing inclusion and exclusion criteria, 3) finding relevant studies, 4) selecting the studies according to the inclusion and exclusion criteria, 5) assessing the quality of retained studies, 6) summarising and synthesising study results, and 7) interpreting the review results (Alderson et al. 2004; Moynihan 2004; Transfield et al. 2003).

This systematic review on knowledge transfer in education sets out to answer the two following research questions: 1) what are the main stages making up a typical knowledge transfer process in education? 2) what are the main determinants of knowledge transfer in education? To be included in the review, a study should deal with knowledge transfer in education, and treat conceptually and/or operationally at least one of the two research issues (i.e., stages and/or determinants of knowledge transfer process). Peer-reviewed papers published between 1980 and 2006, as well as research reports were considered. Books, dissertations and book reviews were excluded, due to time and resource limitations. It is assumed, however, that relevant ideas and significant scientific contributions included in books and dissertations are often published afterwards in peer-reviewed articles.

A three-stage strategy was used to locate relevant studies for the review. A systematic computerized search was conducted within three multidisciplinary and two specialized databases. The electronic search strategy is detailed in the appendix. In addition to the electronic search, a manual search was conducted within all the volumes published between 1980 and 2006 of the following journals: Educational Administration Quarterly, Studies in Educational Evaluation, Teaching and Teacher Education and Oxford Education Review. The manual search also covered some references cited in some electronically identified documents. The third and last stage of our search strategy is the contact of some experts identified within our research network and on the websites of some research centers specialized in education. All the identified documents were treated using the EndNote software in order to identify and eliminate duplicate studies.

All in all, 8981 documents were identified and reviewed by the research team members according to the inclusion and exclusion criteria. A first sorting based on the documents' titles and abstracts led us to exclude 8248 documents that did not meet at least one of the inclusion/exclusion criteria. The thorough reading of the full text of the remaining 773 documents concluded to the exclusion of 677 citations. Hence, 56 documents crossed the double sorting. Each one of these documents was subjected to a meticulous assessment of its methodological quality by all the members of the research team. This step led us to exclude 6 documents. Thus, 50 documents were definitely included in the systematic review (Figure 1).

Figure 1. Systematic Review Flow Diagram



The publications' trend of the included documents (Figure 2) clearly shows that the number of works on knowledge transfer in education increased remarkably since the beginning of the nineties. Most of the studies included in the systematic review are scientific peer-reviewed articles (88.0%) while 12.0% are research reports (Figure 3). Moreover, the distribution of the included studies by type of research (Figure 4) shows that 44.0% of them cover qualitative work, 42.0% are conceptual essays, and only 14.0% include an empirical quantitative validation.

Figure 2. Publications' trend

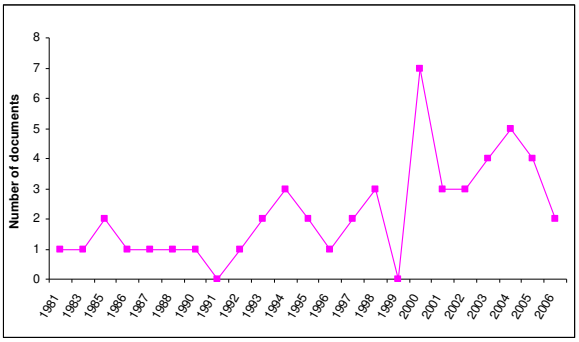


Figure 3. Distribution of the included studies by type of document

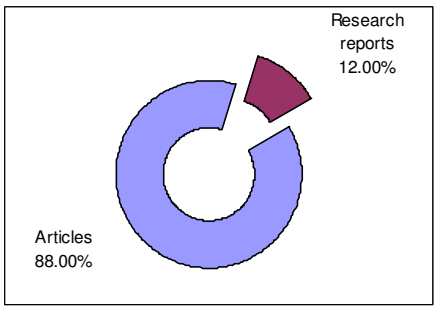
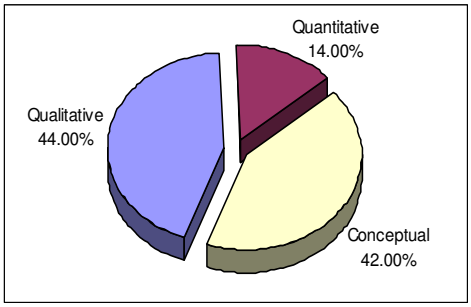


Figure 4. Distribution of the included studies by type of research



The Knowledge Transfer Process in Education

The knowledge transfer process in education aims to increase the use of research results by potential users (Havelock 1973; Huberman 1983) in order to improve practices, to implement new programs, and to resolve specific problems. As explained earlier, four theoretical frameworks led the study of this concept in the education literature: the RDD models, the problem-solving models, the linkage models, and the social interaction models.

The examination of the included studies shows that the three first models have received serious criticisms from the scientific community of researchers on education. In addition to paying all the attention to the university-created knowledge, the RDD models have been criticised to support a logic of absence of knowledge exchange and interaction between actors belonging to different disciplines and different fields of expertise (Hargreaves 1999). This linear approach to knowledge creation and diffusion process, stresses much more the knowledge production phase and practically ignores the users' context (Neville and Warren 1986).

The problem-solving models received, in their turn, two major criticisms. First, these models are only interested in users' needs-driven knowledge. Then, these models ignore the large amount of knowledge produced for other purposes than answering users' needs. Second, these models pay little attention to transfer mechanisms that should be implemented to facilitate the communication between researchers and users. This could result in a significant barrier to knowledge transfer and utilization of research results, especially when the interests and needs of users are not concomitant to the issues investigated by researchers. As for the linkage models, the major criticism they received relates to the specificity and the exclusivity of the mechanisms they suggest to bring together researchers and users. According to Huberman (1983), these models oversimplify the knowledge transfer process by mobilizing a narrow perspective regarding the mechanisms that could be mobilized, especially in the education field (Huberman 1983; Neville and Warren 1986).

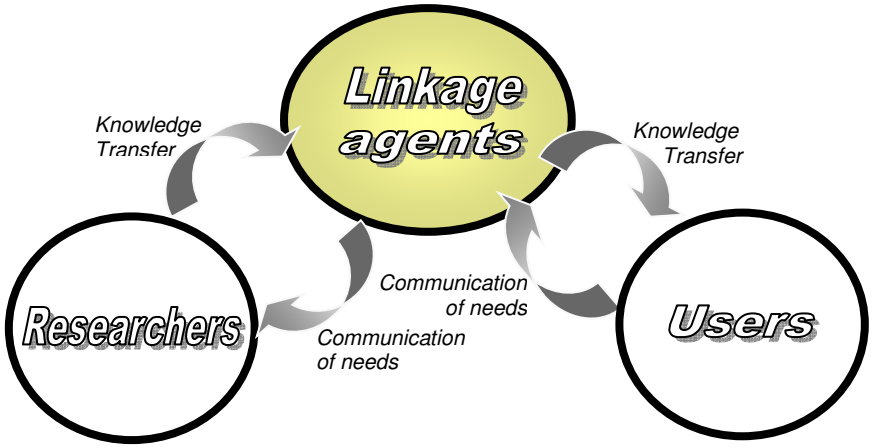
These criticisms addressed to the first three models, place the social interaction one in a favourite position to underlay research on knowledge transfer in education since it overcomes many of the drawbacks of the first ones. Actually, the social interaction framework offers a dynamic perspective to study knowledge transfer. It then puts an equivalent emphasis on both researchers and knowledge users. It also stresses the importance and the critical role of linkage mechanisms to ensure an efficient knowledge transfer between the two communities. In fact, the social interaction model underlines a large set of linkage mechanisms that can develop an effective area of reciprocal interest between the two sides. These mechanisms should not only be adapted to the characteristics of the actors involved in the process, but should also be varied in order to ensure the transfer of different types of knowledge. These mechanisms vary from

written documents, to electronic tools, to even the settlement of intermediary agents between research and practice milieus to make sure the knowledge transfer is occurring in an efficient and effective way.

Beyond the arguments stated for and against the different models underlying research on knowledge transfer in education, the examination of the included studies shows that a large number of works on education investigated the knowledge transfer process between two systems of actors (i.e. researchers and users). Whether using the RDD, the problem-solving, the linkage, or the social interaction model, most of these studies have considered the direct knowledge transfer between researchers and users. Only few exceptions investigated the role that can be played by linkage agents to enhance and improve the knowledge transfer process between these two communities. However, as argued by Havelock (1973), Huberman (1983; 1990), and Huberman and Gather-Thurler (1991), the actors working in the interface between the two communities play a critical role in the knowledge transfer processes. These actors could be specialists interested in university research, pedagogy counsellors working in a school system, or professional managers involved in knowledge transfer activities (Huberman and Gather-Thurler 1991).

Moreover, a framework considering the linkage agents as intermediary actors between researchers and users seems to be more suited to the education field (Figure 5). The latter is a domain of practices requiring an active participation of linkage agents to translate research results into easy to implement and use practices. By favouring the communication of needs between both communities and by facilitating the dissemination and appropriation of knowledge by practitioners, linkage agents could substantially contribute to improve the knowledge transfer process in education.

Figure 5. The Linkage Agents' Framework

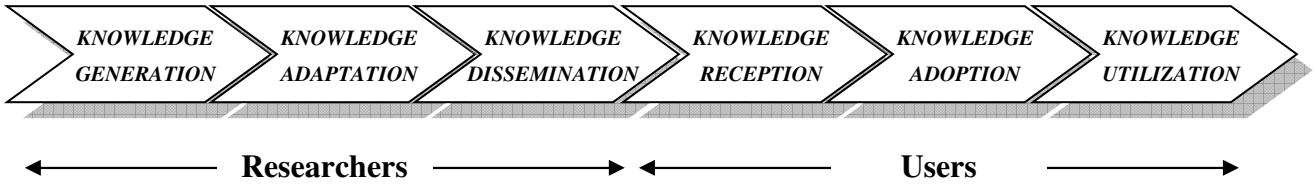


However, in order to investigate the linkage agents' framework of knowledge transfer in education as well as its determinants, an adaptation effort is necessary in order to integrate the research results of the studies considering only two systems of actors. The authors begin by integrating the research results on the dyadic knowledge transfer process (i.e., between two systems of actors) before adapting the results to the triadic knowledge transfer process (i.e., researchers-linkage agents-users).

The knowledge transfer processes between two systems of actors (researchers-users)

The steps making up a dyadic knowledge transfer process varies according to the authors. An integration of the models proposed in the literature leads us to propose a six-step process, going from the generation of knowledge by researchers to its utilization by users (Barnard et al. 2001; Hemsley-Brown 2004; Kirst 2000; Love 1985). These steps include: 1) knowledge generation, 2) knowledge adaptation, 3) knowledge dissemination, 4) knowledge reception, 5) knowledge adoption, and 6) knowledge utilization (Figure 6). The three first steps are commonly attributed to researchers, whereas the other three steps concern the users.

Figure 6. Main steps of a dyadic knowledge transfer process



Knowledge generation consists in the creation of knowledge by knowledge producers (Hemsley-Brown and Sharp 2003; Love 1985). In education, knowledge could be generated from various sources including university research communities, professional associations, ministries and government agencies, transfer and innovation centers, and communities of practice. Knowledge adaptation concerns research results and aims to make them accessible to and easily understandable by potential users. This step is crucial for the success of the knowledge transfer process, since it will have an influence on the decision of the user to adopt or not the knowledge generated by researchers. Indeed, the availability of research results does not necessarily guarantee their adoption and utilization by potential users. Several authors have found that the format in which the research results are presented could be an incentive or a barrier to the adoption of knowledge in the education community (Hemsley-Brown 2004; Kirst 2000; Love 1985).

Knowledge dissemination is associated with the transfer of research results to communities of practice (Neville and Warren 1986; Hutchinson and Huberman 1993). Dissemination is a complex process whose success depends simultaneously on several dimensions like the dissemination agent's characteristics (e.g., its credibility), the disseminated product (e.g., relevance of research results for users), the final user's characteristics (e.g., personal motivation to use research results), the communication channels used (e.g., collaboration networks), the communication format (e.g., presentations, reports, etc.), as well as the resources allowed for these activities (e.g. time, human and financial resources) (Huberman and Gather-Thurler 1991; Kirst 2000). Failing to take these dimensions into account, is often cited as one of the reasons why research results are under-utilized by practitioners in education (Boostrom et al. 1993; Hemsley-Brown 2004; Wikeley 1998; Willmott 1994).

Knowledge reception refers to the user's first contact with the knowledge generated, adapted and disseminated by the researcher. The success of this step largely rests on the previous steps researchers' endeavour in order to make research results easily accessible for, and understandable by users (Barnett 2005; Bickel and Cooley 1985; Hemsley-Brown and Sharp

2003). However, the effectiveness of this step also requires the awareness of knowledge receivers (Rogers 1995 cited by Hemsley-Brown and Sharp 2003). This awareness depends primarily on the interest the users have for research results and the concrete needs these research results could eventually satisfy (Roy et al. 1995).

Knowledge adoption is the next step in the knowledge transfer process. The adoption concept is mainly investigated in the literature on innovations' adoption (Roy et al. 1995). As defined by Rogers (1983), cited by Roy et al. (1995), adoption refers to the path an individual, or any other decision-making unit, uses to pass through the process of 1) having a first level of awareness of the existence of an innovation, 2) forming an attitude towards the innovation, 3) making a decision whether to adopt or reject the innovation, 4) implementing the new idea, and 5) finally, confirmation of the adoption decision. The determinants of adoption have been widely documented in the literature on innovation diffusion, especially through Rogers' works (Hemsley-Brown and Sharp 2003). In the context of knowledge transfer, the adoption determinants include the motivation of the receiver to use or not use the new knowledge, the degree of resistance to external knowledge, the actors' leadership, the compatibility with existing policies and practices, the availability of resources, etc.

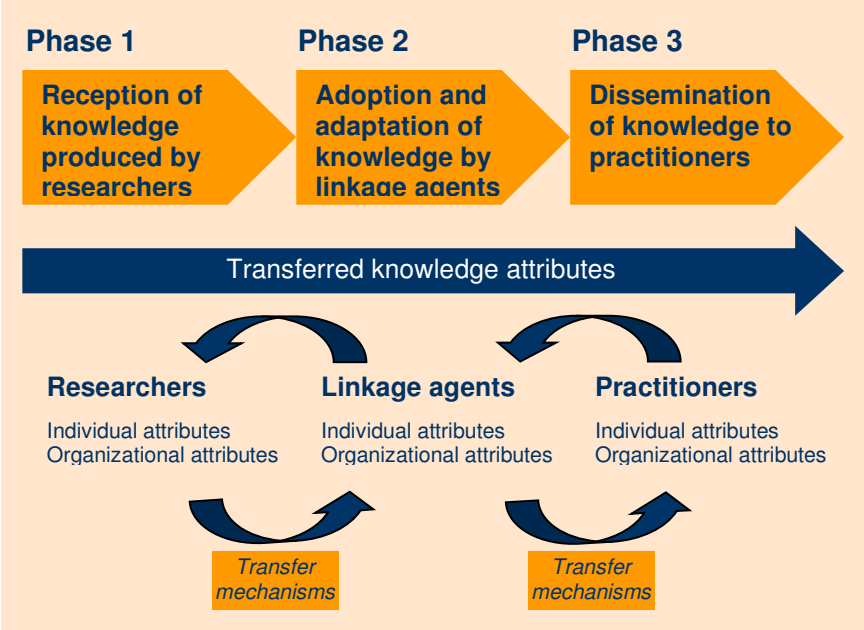
Finally, knowledge utilization refers to the application of the knowledge generated, adapted, and disseminated by the researcher, and received and adopted by the user in order to achieve specific goals and objectives (Bickel and Cooley 1985; Love 1985). Beyer and Trice (1982), cited by Roy et al. (1995), distinguish three forms of knowledge utilization: 1) instrumental utilization (research results are used to solve concrete problems or to meet specific needs), 2) conceptual utilization (knowledge is used to support and provide food for thought), and 3) symbolic utilization (knowledge is used to legitimate, justify and support decision making). Several studies (e.g. Bickel and Cooley 1985; Hemsley-Brown 2005; Huberman and Gather-Thurler 1991; Herrington 1998; Kirst 2000) found that these three forms of knowledge utilization apply to the education context.

It is worth noting that even though the knowledge transfer process is presented here as a linear one, it is seldom the way it occurs in practice. As argued by Roy et al. (1995), each step in the process often requires continuous iterations, therefore feedback loops are necessary. However, the sequential presentation is often used instead of the cyclic one, mainly because it facilitates the knowledge transfer process description.

The knowledge transfer process according to the linkage agents' perspective (researchers-linkage agents-users)

The reality of knowledge transfer in education shows that there is still a large gap between research and practice. In spite of the huge amount of knowledge generated by researchers, research results often fail to effectively come through the subsequent steps of the knowledge transfer process. This makes their utilization by users a low probable event. To overcome this shortcoming, the role that could play the linkage agent as an intermediary actor between researchers and users becomes critical (Roy et al. 1995). Linkage agents, also called knowledge brokers, boundary-spanners, gatekeepers, or translators in the education literature (Brown and Duguid 1998), are individuals that have contact with both researchers and users, and could then build a bridge allowing a better interaction between them.

Figure 7. Determinants of knowledge transfer in education according to the linkage agents' perspective



As noticed earlier, the linkage agents' perspective suggests that researchers disseminate their research results to linkage agents, whose role is then to facilitate their transfer and diffusion to users. The intermediation role of the linkage agents means that the knowledge transfer process is composed of two dyadic ones: a transfer process between researchers and the linkage agent, and another one between the latter and practitioners. Hence, the global knowledge transfer process could be conceived in three main phases (Figure 7). In phase 1, linkage agents receive the knowledge produced and disseminated by researchers. Then, they adopt and adapt this knowledge to practitioners' conditions and context (phase 2), before disseminating it to knowledge practitioners (phase 3).

Determinants of Knowledge Transfer in Education

The reviewed studies allow to bring out several determinants of knowledge transfer in education. Having conceived knowledge transfer as a three-phase these determinants are presented according to these phases. This study suggests three main categories of determinants of the knowledge transfer process in education: 1) the determinants related to the transferred knowledge attributes, 2) those related to the characteristics of actors involved in the knowledge transfer process (i.e., researchers, linkage agents and practitioners), and 3) the determinants related to the transfer mechanisms (Figure 7).

Determinants related to transferred knowledge attributes

The determinants of knowledge transfer related to the transferred knowledge attributes correspond to the characteristics that this knowledge should have in order to facilitate its transfer between actors. The review of the included studies reveals several transferred knowledge attributes that have a direct impact on the knowledge transfer process effectiveness and results.

First, the transferred knowledge should be easy to understand by the receiver. It should use appropriate simple, precise and clear language and be supported by concrete examples and experiences (Kilgore and Pendleton 1993; Kirst 2000). Explicit and codified knowledge is certainly easier to transfer and to explain than tacit knowledge, since it is often supported by formal conceptual frameworks and accurate language (words, numbers, symbols, graphs, etc.) (Rynes et al. 2001). However, Benjamin Martz and Shepherd (2003) argue that in education, explicit knowledge is not sufficient and should, most of the time, be supported by tacit knowledge in order to ensure a successful transfer process. This is because in education, knowledge transfer is often about personal and collective experiences as well as best practices, which give practical value to knowledge users (Abdoulaye 2003, Anis et al. 2004).

The transferred knowledge should also be applicable to the education context in order to help its transfer. Hemsley-Brown and Sharp (2003) show that the lack of applicability of the transferred knowledge is one of the most important barriers to its adoption and utilization by potential users. Applicability involves that knowledge consider the specificities of the education context (values, ideologies, practices, etc.), answer specific users' needs, and be easily usable by practitioners (Bickel and Cooley 1985; Kirst 2000; Lloyd et al. 1997; Love 1985).

The effectiveness of knowledge transfer in education also depends on its accessibility. When the information coming from research is easily available and accessible, this makes it easier for practitioners to use it. Accessibility here is not only related to the physical availability of knowledge, but also to its intellectual accessibility (Hemsley-Brown 2004). The impressive number of scientific papers and research reports published on education could be a serious barrier to their use by practitioners (Hemsley-Brown and Sharp 2003). It then becomes important for the linkage agent to assess the relevance of the available knowledge, and to make syntheses of pertinent research results before disseminating them in a simple and clear way to users.

Another important attribute of the knowledge that could have an important impact on the effectiveness of its transfer, is its relevance. Relevance means that knowledge should be interesting, credible and produced at the opportune time. According to some authors, the relevance of the transferred knowledge plays an important role to ensure the effectiveness of its transfer, and could contribute to bring researchers and users closer (Abdoulaye 2003; Boostrom et al. 1993; Carter and Doyle 1995; Love 1985). Hemsley-Brown (2004) argues that the research design has an important impact on the degree of relevance of its results as perceived by practitioners. When the research is conducted according to users' needs and involves practitioners in the early stages of the research process, the results could be perceived as more relevant by users (Lloyd et al. 1997). According to Boostrom et al. (1993), relevant and useful results are not abundant in the educational field. It is then important for future research to put emphasis on the relevance, and usefulness, of their research for practitioners to ensure a better knowledge transfer.

Actors' related determinants

The review of the included studies allows for the identification of several determinants of knowledge transfer that are related to the actors involved in the process (i.e. researchers, linkage agents, and practitioners). These determinants are presented by distinguishing for each actor, those related to the individuals and those concerning the organizational context. While the first determinants are related to the actors themselves, the second ones concern the institutional characteristics of the organization to which those actors belong.

Researchers' related determinants

Determinants related to researchers concern the endeavours that these researchers as well as their institutions should make, in order to facilitate the transfer of their research results to linkage agents or practitioners. At the individual level, the adaptation, contextualization and dissemination efforts made by the researcher are crucial determinants of the process of knowledge transfer in education (Hemsley-Brown 2004; Bickle and Cooly 1985; Love 1985; Huberman 2000; Anderson and Franklin 2000; Ozga 2004; Anderson 1992; Abdoulaye 2003). It is then important that researchers allocate the necessary time to bring to fruition these activities. Researchers' credibility also has a significant impact on the transfer of their research results. This credibility is often developed with time due to sustained interactions between researchers and the other actors involved in the knowledge transfer process (Huberman 1987; 1990).

At the organizational level, the determinants of knowledge transfer are mainly related to the experience of the research organization (university, research center, etc.) with knowledge transfer activities (Anis et al. 2004), as well as the importance and the recognition given by the organization to these activities (Abdoulay 2003). Therefore, research organizations willing to collaborate with linkage agents and/or practitioners in education, should implement incentive policies and release the necessary resources (time, funding, etc.) to encourage their researchers to engage in knowledge transfer activities.

Linkage agents' related determinants

As mentioned above, linkage agents play a crucial role in the knowledge transfer process as intermediaries between researchers and end users. Therefore, the effectiveness of the process depends largely on the attributes of these linkage agents, both at the individual and the organizational level.

The literature on knowledge transfer in education shows that the professional experience, the cognitive abilities, the social capital as well as some personal attributes of the linkage agents, are important determinants of knowledge transfer. Obviously, linkage agents should have some experience in knowledge transfer activities (Anis et al. 2004; Beier and Ackerman 2005). This experience develops with time, but could also be acquired through participation in thematic conferences, seminars and workshops (Matzat 2004). The cognitive abilities of linkage agents, refer to their capacity to grasp and assess the quality of research results, as well as their ability to select pertinent research issues according to the education context and stakes (Hemsley-Brown 2004; Kilgore and Pendleton 1993; Miller et al. 1994). The cognitive abilities of linkage agents are an important determinant of knowledge transfer in education, since they have a direct impact on the adoption and adaptation efforts they make, before disseminating knowledge to practitioners (Hemsley-Brown 2004; Miller et al. 1994; Kilgore and Pendleton 1993). The cognitive capacities of linkage agents could be reflected by the graduate academic degrees they earned which indicate their familiarity with the research process and results.

The social capital held by linkage agents is another determinant of knowledge transfer in education. It refers to interactions, partnerships and collaborations they develop with researchers and practitioners (Ozga 2004; Hammett and Collins 2002; Rynes et al. 2001; Chickering and Gamson 1999; Love 1985). Social capital could be enhanced through face-to-face meetings and electronic interactions between actors (Chickering and Gamson 1999; Hammett and Collins

2002), but also with social events and activities (Rynes et al. 2001). Finally, the reviewed studies reveal some other personal attributes that determine the effectiveness of knowledge transfer in education. This includes the linkage agents' positive attitude toward research (Gauquelin and Potvin 2006), their leadership (Hemsley-Brown 2004; 2005), and their openness to newness and change (Ozga 2004).

In addition to these individual attributes, some characteristics related to the organization to which the linkage agent belongs are also important to ensure the effectiveness of knowledge transfer. These organizational determinants particularly concern the organizational structure and context, as well as the resources and policies dedicated to knowledge transfer activities. Organizations showing a low degree of centralization and formalization are more likely to succeed in their knowledge transfer activities (Browne 2005). Moreover, bureaucratic procedures and the lack of support and negatives pressures from colleagues, figure among the major obstacles to knowledge transfer (Browne 2005; Barnard et al. 2001). It then becomes important to the linkage agent's organization to develop and sustain a culture that encourages collaboration and information-sharing, in order to improve the effectiveness of knowledge transfer (Lloyd et al. 1997).

Financial, human, and physical resources are also mentioned as important determinants of knowledge transfer in education (McPherson and Nunes 2002; Patricia 2000; Abdoulaye 2003; Powers 2003; Hemsley-Brown 2004). The time allowed for knowledge transfer activities is also an important factor of their success. Hemsley-Brown (2004) argues that one of the factors constraining knowledge transfer and utilization in education is the lack of time, for linkage agents, to read, understand, adapt and disseminate research results. Finally, the examination of the articles included in our systematic review shows that organizations having established internal policies to encourage knowledge transfer activities between and by their employees, succeed better in transferring knowledge than those that do not have such policies (Huberman 1983; Wikeley 1998; Abdoulaye 2003; Miller et al. 1994). These policies could consist in financial incentives, promotion opportunities or training for members engaged in knowledge transfer activities (Huberman 1983; Abdoulaye 2003).

Practitioners' related determinants

Practitioners (i.e., teachers, pedagogic counsellors, etc.) are the end users of the knowledge produced by researchers and adopted, adapted and disseminated by linkage agents. The reviewed studies show that some determinants of knowledge transfer are related to practitioners' individual and organizational attributes. Once again, the time allowed by practitioners to acquire and adopt new knowledge is an important determinant of knowledge transfer. As argued by Hemsley-Brwon (2004), the lack of time is one of the barriers preventing practitioners from going through transferred knowledge. Practitioners' adoption and use of knowledge are also conditioned by their motivation to do this. Some authors (e.g. Baldwin and Ford 1988; Nyden and Wiedel 1992) suggest enhancing this motivation by establishing a reward system that encourages practitioners to use and implement new practices and programs in their immediate context. The implication of practitioners at an early stage in the research process is another determinant of their adoption and utilization of research results, since it allows them to better understand these research results (Huberman 2002; Hemsley-Brown and Sharp 2003). Finally, the practitioners' competencies in research are another determinant of knowledge transfer towards educational establishments (Collinson et al. 2003). Therefore, training should be

offered to practitioners in order to allow them to develop linkages with researchers and linkage agents, and also to get used to research results (Huberman and Gather-Thurler 1991).

At the organizational level, the organizational climate, culture, structure, procedures, and resources are among the cited factors as determinants of knowledge transfer in education (Alexander 2000; Ben-Peretz 1994; Bickel and Cooley 1985; Huberman 1987; 1990). The organizational climate could act as a facilitator, or an obstacle to knowledge transfer. Some situations, like a lack of organizational support to knowledge activities, a lack of explicit implication of managers in the process, and a negative attitude towards research, could prevent knowledge transfer to schools (Barnard et al. 2001; Bickel and Cooley 1985). As for the organizational culture, the education field is often characterized by a shortage of time for practitioners to plan their activities, a rigid timetable, a predetermination of curriculum, content and materials, and an emphasis on order which are all factors that impede knowledge dissemination towards practitioners (Ben-Peretz 1994). In addition, the success of knowledge transfer depends on the perception that the practitioners have of the benefits of the research results on their context and practices (Huberman 1983). However, most of the time, practitioners rarely perceive these benefits due to their often busy schedule. The consequence is a lack of attention given to research results by practitioners.

An important obstacle to knowledge transfer in education is the large gap between researchers and practitioners (Huberman 1983; 1987; 1990; Ben-Peretz 1994). Most of the time, practitioners perceive researchers as belonging to a theoretical world which is far from the concrete context of educational establishments and systems. It then becomes important to try to bring the two communities (i.e. researchers and practitioners) closer, in order to reduce this gap and create a better atmosphere for cooperation and knowledge transfer (Hemsley-Brown and Sharp 2003; Miller et al. 1994). Finally, it's worth noticing the importance of physical, financial and human resources as determinants of knowledge transfer. When practitioners have, at their disposal, adequate resources, it could help them to better acquire, adopt and use new knowledge (McPherson and Nunes 2002; Powers 2003).

The actors' related determinants of knowledge transfer in education are summarized in table 1.

Table 1. Actors' related determinants of knowledge transfer in education

Actors	Individual attributes	Organizational attributes	Selected references
Researchers	- Adaptation efforts - Contextualization efforts - Dissemination efforts - Researchers' credibility	- Experience in knowledge transfer - Emphasis given to knowledge transfer	Abdoulaye (2003); Anderson & Franklin (2000); Anis et al. (2004); Hemsley-Brown (2004); Hubeman (2000); Ozga (2004)
Linkage agents	- Professional experience - Cognitive abilities - Social capital - Personal attributes	- Organizational structure - Resources dedicated to knowledge transfer - Policies to encourage knowledge transfer	Anis et al. (2004); Beier & Ackerman (2005); Chickering & Gamson (1999); Hammett & Collins (2002); Hemsley-Brown (2004); McPherson & Nunes (2002); Matzat (2004); Rynes et al. (2001)
Practitioners	- Time allowed to acquire and adopt new knowledge - Motivation to acquire and adopt new knowledge - Ability to understand research results	- Organizational climate - Organizational culture - Organizational structure - Organizational procedures and policies - Organizational resources	Ben-Peretz (1994); Bickel & Cooley (1985); Collinson et al. (2003); Hemsley-Brown (2004); Huberman (1987; 1990); Huberman & Gather-Thurler (1991)

Determinants related to transfer mechanisms

Transfer mechanisms consist of all the means through which knowledge moves along the knowledge transfer process. They allow actors (i.e. researchers, linkage agents and practitioners) to exchange knowledge and information. The reviewed literature shows that there are several mechanisms that could be used to promote knowledge transfer in education, but also that these transfer mechanisms have an impact on the effectiveness and the success of the knowledge transfer process. Two categories of transfer mechanisms are distinguished in the literature: 1) the information mechanisms, and 2) the interaction mechanisms.

Information mechanisms refer to the ways used to acquire or disseminate knowledge without personal interaction with other actors. This includes, for example, research reports, scientific papers, professional journals, information reports, best practices guides, education tools, emails, blogs, etc. (Argote et al. 2000; Bickel and Cooley 1985; Huberman 2002; Kirst 2000; Neville and Warren 1986). Abdoulaye (2003) suggests the creation of a central database of

good practices and innovations developed in education as a solution to optimize knowledge management and transfer. He argues that an adequate conception and presentation of these databases, along with an available access for practitioners, would encourage the latter to use new knowledge and practices.

As for interaction mechanisms, they consist of the ways used to acquire or disseminate knowledge by relying on personal interactions with other actors. Some examples of interaction knowledge transfer mechanisms are oral presentations, academic conferences, seminars, professional colloquiums, workshops, training sessions, formal meetings, informal discussions, social activities, etc. (Boostrom et al. 1993; Chazan et al. 1998; Hemsley-Brown and Sharp 2003; Neville and Warren 1986; Ozga 2004). Interaction mechanisms are very important to ensure the success of knowledge transfer, especially in education where transfer concerns tacit knowledge, experiences and competencies most of the time. This kind of transfer requires an iterative, interactive and reflexive process between actors. Implementing an educational reform, for example, calls for creating opportunities to test and discuss pedagogic changes that this reform entails (Omar El-Sheikh 2000). These opportunities allow practitioners not only to adopt the new knowledge, but also to share their experiences and to develop a collective new practice in a new educational structure (Briscoe and Peters 1997; Hammett and Collins 2002; Kahne and Westheimer 2000; Serafini 2000; Wagner 2003). Training sessions are probably the most suitable knowledge transfer mechanism in education (Argote et al. 2000). They allow practitioners to develop new abilities related to the application of new knowledge in concrete work situations (Barnard et al., 2001). This should increase their interest in new knowledge and consequently its adoption and use.

Discussion and Implications

Knowledge transfer is critical to improve policies and practices in education. Our findings suggest that linkage agents are central actors in the knowledge transfer process. Actually, the knowledge to be transferred in the education field is diversified. It includes pedagogic programs and reforms as well as factual, interpersonal and conceptual knowledge. In many cases, the complexity of the knowledge produced by researchers could make it difficult for practitioners to understand and adopt it. Hence, the intervention of linkage agents becomes essential in order to adapt the knowledge produced by researchers and to make it easier for practitioners to adopt and use it.

Along with the major role played by linkage agents, the effectiveness of knowledge transfer in education also depends on other factors. Our findings suggest that, in education, the determinants of knowledge transfer could break down into three major categories, namely: 1) determinants related to transferred-knowledge attributes, 2) those related to the actors involved in the process (i.e., researchers, linkage agents and practitioners), and 3) determinants related to transfer mechanisms. Determinants are by definition intervening variables in the sense that the presence of each one of them could increase the effectiveness and/or the efficiency of the knowledge transfer process. Thus, managers and policy-makers could use these determinants as levers to improve their knowledge transfer strategies and practicies.

The determinants related to the transferred-knowledge attributes suggest that linkage agents should ensure that the knowledge to be transferred to practitioners is intellectually and physically accessible to them. This knowledge has to be applicable and easily adaptable to the practitioners' specific context. The actors' related determinants suggest that, when interacting

with researchers, linkage agents have to choose, as much as possible, those who make every endeavour to adapt, contextualize and disseminate their research results. They should also choose those researchers who maintain sustainable interactions with the practice sphere. In addition, linkage agents have to interact more with researchers coming from research organizations that possess good experience, and encourage and promote knowledge transfer activities.

In addition, in order to improve knowledge transfer in education, linkage agents have to allow the necessary time for their transfer activities. They also have to regularly attend academic and training programs in order to update their competencies and maintain cognitive abilities allowing them to follow, understand and utilize the knowledge coming from research. Another important issue for linkage agents is to maintain regular and repetitive interactions with practitioners, and to create communication and exchange opportunities between researchers and practitioners. On the organizational side, knowledge transfer organizations have to be able to identify research results from multiple sources (universities, colleges, research centers, etc.), and promote a culture of information-sharing and exchange inside their organization, as well as with researchers and practitioners. They also have to provide the necessary resources and to set up policies that encourage and promote knowledge transfer activities.

In order to improve the knowledge transfer process, linkage agents also have to use a language that is simple and common to practitioners when adapting research results. Their adaptation efforts should lead to information presented in a synthesized, attractive and comprehensible way. Moreover, linkage agents should encourage interactions between practitioners. They should also promote a culture of critical thinking, questioning and debating within the practice sphere. In addition, linkage agents have to explain to practitioners the potential impacts of reforms and changes, and create opportunities to test the proposed changes in situ before generalizing them on a larger scale. It's also important to use multiple mechanisms when communicating and transferring knowledge with researchers and practitioners. These mechanisms could be simply informative (e.g., reports, scientific papers, web sites, etc.) or designed to foster interaction between actors (e.g., oral presentations, conferences, workshops, training sessions, seminars, etc.).

Finally, it's worth noticing that our results are based on the best available knowledge on knowledge transfer in education. However,it should berecognize that in practice, each agency, each organization and each establishment is specific and particular. That is why the authors propose to consider our results as avenues to improve knowledge transfer in education and to be conscious that they could, and should be enriched according to the specific context of users.

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Appendix. Electronic Search Strategy

1. **Databases' Description (source: web site of Laval university library, www.bibl.ulaval.ca)**

   MULTIDISCIPLINARY DATABASES.

   - ProQuest ABI/INFORM global. This database indexes about 1800 economical journals from around the world.
   - EBSCO. The search was done within the following sub-databases:
     - *Business Source Premier (BSP)*. This database covers economic and business fields. It indexes the full text of thousands of peer-reviewed and academic journals.
     - *Academic Search Premier (ASP)*. It indexes about 4600 periodicals in major knowledge fields.
     - *Educational Resources Information Center (ERIC)*. It includes abstracts of articles coming from more than 900 scientific journals including Current Index to Journals in Education (CIJE) and Resources in Education (RIE).
   - ISI Web of Science. This database indexes the main journals in the fields of sciences, social sciences and arts.

   DATABASES SPECIALIZED IN EDUCATION.

   - Education Abstracts. This database indexes the abstracts of published works on education.
   - CBCA Education (via CBCA complete). This database allows access to a large variety of Canadian periodicals dedicated to education.

2. **Search Strings**

   SEARCH STRING 1

   (knowledge **OR** information **OR** research **OR** practice **OR** results **OR** findings**) AND (**transfer **OR** utilization **OR** dissemination **OR** diffusion **OR** adoption **OR** adaptation **OR** translation **OR** assimilation **OR** acquisition **OR** sharing **OR** generation**) AND (**educ* **OR** training **OR** school **OR** scholar **OR** teach* **OR** learning **OR** pedagogi* **OR** academic **OR** curriculum **OR** formation**)**

   [*The symbol (*) indicates that all the words having as a root the set of characters preceding it are located by the search engine*]

   SEARCH STRING 2

   (connaissance **OR** information **OR** recherche **OR** pratique **OR** résultat **OR** savoir**) AND (**transfert **OR** utilisation **OR** dissémination **OR** diffusion **OR** adoption **OR** adaptation **OR** vulgarisation **OR** assimilation **OR** acquisition **OR** partage **OR** génération**) AND (**éduc* **OR** formation **OR** école **OR** scolaire **OR** enseign* **OR** apprentissage **OR** pédagog* **OR** académique **OR** curriculum**)**

   [*This search string is the French equivalent of the search string 1*]

   SEARCH STRING 3

   pedagog* W3 chang*

   [*The symbol W3 indicates that the two words it links have not to be separated in the text by more than three words. This technique was used in order to avoid the unlimited number of research documents dealing with changes others than pedagogic*]

3. Search strategy

In order to keep the number of retrieved documents under control, and following Thorpe et al. (2005), the following search strategy was adopted:

- The initial search with each search string is done in the documents' title, abstract and keywords;
- If more than 1500 documents are obtained, the search is restricted to documents' title and abstract;
- If more than 1500 documents are obtained, the search is restricted to documents' abstract;
- If more than 1500 documents are obtained, the search is restricted to documents' title.

Promoting the academy – the challenges of marketing higher education

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Abstract

One of the challenges in promoting higher education is the assumption that students are not customers or neither are their parents. Also, many academics and university personnel are likely to view marketing as compromising academic freedom. Additionally, universities attempt to market what is essentially a service in the same way as they market products. Universities have third party accountability, client uncertainty, limited differentiality and making doers into sellers. Some of the barriers to implementing marketing programs is shared governance, decentralized decision making, collaborative environment and the relationship between faculty and administration. Historically, many university marketing and communication offices have foundations in public relations, public affairs and community relations. The present study attempted to answer the following questions. 1. How are today's university marketers making decisions and what are their greatest challenges? 2. Given the characteristics of an academic environment, what challenge does the university marketer face when allocating often inadequate resources? The sample for the study was university communication professionals. The results indicated less than 50% had a marketing plan for more than one year and that only 41% of these professionals allocated their marketing dollars on the basis of marketing demand. One conclusion from the study is to develop a curriculum that is in tune with the student. This can be the most important marketing asset that an organization can use in its marketing programs. One lesson learned from the study is that all aspects of encounters with university by perspective students, parents, current students and alumni are elements that partially compare the brand.

Keywords: Allocation, Service, Advertising, Barriers, Implementation

I. The Challenge

One of the most heated conference presentations I have ever witnessed took place in a large lecture hall at Loyola Marymount University in Los Angeles and it involved an academic vice president at one prestigious Jesuit university and a vice president for university relations at another. The topic? Branding. Many people outside of higher education have a hard time understanding why universities have a history of reluctance in embracing marketing strategies to connect themselves with their key audiences -- primarily prospective students and donors. While the conversation at LMU in June 2004 likely was heightened by the added element of including faith into the branding discussion, faculty and administrators at secular universities have just as vehemently denounced what they view as attempts to make customers out of students. Against this historical backdrop, how is the marketer in today's highly competitive higher education market to make decisions regarding the allocation of scarce resources among institutional priorities and educational programs?

II. The Context

Students are not customers; neither are their parents. We do not have customers. We must keep repeating this. That a group of administrators in Jesuit higher education would state otherwise in a document of potential strategic importance should concern us. Do not accept that 'customers' is a term of art. It is an assumption inherent in 'branding' and it defiles our mission. (Hollwitz, 2004)

John Hollwitz, Ph.D., who spoke at the aforementioned conference, was vice president for academic affairs at Fordham University when he wrote the above passage in an article on the "problem" of branding. For Hollwitz and many other members of the academic side of the house, marketing and branding represent attempts to denigrate higher education by reducing its essence to shorthand, to an easily remembered slogan and one that might not even be true.

Thomas J. Hayes, Ph.D., professor of marketing at Xavier University, higher education marketing consultant and author, explains this notion as an almost primal fear that resides within many faculty members.

The fact is that many professionals working on the college campus, particularly faculty members, are likely to feel that implementing marketing techniques limits and compromises academic freedom. In addition, they may also feel that the real business of marketing is to create illusions. Beautiful pictures of a college campus on a fall day, combined with well-crafted ad copy, seem to offer promises that cannot be kept. (Hayes, 2008)

So why should the marketing department care what those in the academic division think about the appropriateness of university marketing activities? The reasons are multiple and varied, from historical precedents to modern practicalities. Academe is a place for collegiality, for shared governance, for decisions by committee. In many university organizational structures, the enrollment division—a major client of the marketing and communications office—falls under the auspices of the academic division. This means decisions on marketing objectives, strategies, tactics and budgets must be made in a collaborative manner.

For Hayes, a paramount reason to work together is that "marketing cannot be left up to 'the marketing department.'" He says that all at the university must work together to deliver what today's students are looking for – "a total educational experience." That is certainly evidenced at our own University, according to our admission staff. Students visit multiple campuses and make comparisons, comparisons of amenities such as recreational facilities and living spaces; services such as financial aid, information technology and tutoring; and the educational experience itself.

Perhaps the mistake some university marketers make is trying to market what amounts to a service (although faculty might disagree with this premise) in the same way they would market products. Hayes contends that although a university's core business is education, it also participates in a variety of service businesses. It's not surprising that some marketers have trouble making distinctions regarding strategy, according to Hayes, because the literature did not fully acknowledge the distinctiveness of marketing services until the mid 1990s. Anyone who has studied marketing in a cursory manner is familiar with the "four Ps" that constitute marketing: product, price, place and promotion. For services marketing, Hayes adds three additional Ps: physical evidence, processes and people.

For physical evidence, Hayes describes how physical facilities can translate into perceptions of quality, as in the case of a student who comes from an upscale high school with science labs sporting the latest technological advances and tours a college campus that has older

science labs but may boast a Nobel laureate on the faculty. The appearance of the lab may make a statement that's hard to counter through other facts.

Processes in a university setting means that when students conduct business with the financial aid office or seek to arrange tuition payments with the business office, their baseline for performance is the excellent customer service they experience at their local bank branch. If they encounter archaic methods of moving through the system or a process that's not accommodating, they will form an opinion about the university that could conceivably carry through to taint their impression of the educational quality.

Lastly, Hayes cites people as the crux of any service-based business. His example, universities that tout personal attention, matches what is emerging as a strong brand characteristic of Rockhurst. This means that all faculty and staff at the university must accept the responsibility of ensuring this brand promise is kept, from the person who takes the tuition check to the chemistry professor teaching a difficult class to the person making lunch in the cafeteria.

In addition to making the distinction that marketers cannot use the same methods to market services as goods, Hayes further delineates marketing higher education from marketing other services. He cites marketing guru Philip Kotler, author of many authoritative marketing texts. Kotler identifies 10 problems inherent in marketing services and Hayes takes this a step further to apply these problems to marketing higher education. (Hayes, 2008)

Problem	University Concern
Third-Party Accountability	Universities must maintain credibility with parents, donors, alumni, employers and other stake holders
Client Uncertainty	It's documented that consumers of big-ticket items can feel buyer's remorse, so most salespeople follow up shortly after the sale to ensure customers are comfortable with their decision and to counteract any extreme fears. After a student makes the major decision about which college to attend, key units within the university, such as student development, the business office and the academic department, must maintain contact to reinforce that the student's decision was wise and valid. Little or no contact between the time of acceptance and reporting for class can result in a student changing his or her mind.
Experience is Essential	The university's "brand" is based on quality, which often translates into faculty with vast teaching experience. However, especially in business-related disciplines, this must also translate into real-world experiences. Marketers must be able to accurately convey this balance.
Limited Differentiality	Although universities know they must find the unique attributes that make their institution distinctive, claims for universities within the same category, such as faith-based liberal arts colleges, may sound very similar: "academic rigor, personal attention, and the teaching of values and ethics."
Maintaining Quality Control	All service industries experience variability in quality control because the humans delivering the service can be inconsistent transaction to transaction and person to person. Quality at a university depends not only on behavior and competence of all

	faculty and staff it depends on the behavior of the students who become alumni – a key indicator of reputation.
Making Doers Into Sellers	Faculty can be highly effective in the recruiting process but may be resistant to this role that seems outside their area of responsibility.
Allocating Faculty and Staff Time to Marketing	Hayes expounds on the previous problem by making the case that even if faculty are resistant the university will benefit from a culture shift toward involving everyone in marketing efforts to the extent that this expectation is made explicit in job descriptions.
Reorienting the Reactive to the Proactive	"The orientation of most institutions of higher education is naturally reactive rather than proactive…In most colleges and universities, marketers are tasked with marketing the institution as it is. *This is who we are and what we offer,* administrators tell the marketers. *Promote it.*"
Conflicting Views on Advertising	Traditionally, some in higher education equate marketing with advertising and feel that at the worst, advertising cheapens the university image and puts it on par with for-profit educational institutions. At the best, it wastes scares institutional resources that could be channeled toward academic programs. Others believe it is a valuable tool for educating potential students and donors about the university's benefits.
A Limited Marketing Knowledge Base	Hayes contends that every faculty and staff member must have a basic grasp of marketing principles to achieve the levels of service required to effectively market the university. He contends that marketers in general do not have solid base of knowledge regarding the marketing of services and that higher education is even more specialized. Marketers who come from an environment of marketing goods must become familiar with the politics and stakeholder groups in an academic setting. Likewise, faculty and staff who have had no exposure to marketing concepts need basic training.

III. Current Practice

Although nonprofit higher education at large has been slow to adopt many practices that are standard in the corporate setting, some areas of the academy, such as the business office, information technology, and student housing have taken great strides in this area. From methods of investing the endowment to implementing purchasing procedures to outsourcing operations such as the bookstore and construction and management of apartment-style residence halls, the functional areas that oversee these efforts have blazed a trail that has made more people within higher education at least familiar with, if not comfortable with or accepting of, ways of doing things that seem new and foreign.

Throughout the past decade, offices of marketing, public relations and communication, however they are labeled, also have begun to change. The reasons for this are multiple. Of primary importance, especially for smaller institutions, is that stiff competition demands assertive action to attract and retain students in the target markets. According to information

from Noel Levitz enrollment management consultants, there are 129 colleges and universities in Missouri and 59 in Kansas. When prospective students have this many choices, universities must not only get the right information into the right hands, they must clearly differentiate themselves from competitors and fulfill the brand promise throughout all phases of engagement, including inquiry, matriculation, student and alumnus.

While past offices of marketing communication focused primarily on public relations efforts, advertising and fulfilling requests from the enrollment office for print collateral pieces, most universities today have placed marketing and branding efforts front and center. A June 2008 article from *Currents,* the magazine published by the Council for the Advancement and Support of Education, discusses the changing paradigm. "It used to be that if you scratched the surface of a campus communications office, more often than not you would find a former journalist. But that began to change when the news-bureau model of campus communications evolved into an integrated marketing operation." (Jarrell, 2008)

As the university marketing function becomes more focused on standard practices such as developing and implementing formal marketing plans, establishing metrics to measure accountability and including new methods of communication in the marketing mix, it is appropriate to also review how marketing budgets are allocated among insitutional initiatives, including academic programs — the rough equivalent of product lines in a corporate environment.

Methodology

To better assess current practices among university marketers, research was conducted on how marketing decisions are made in the higher education environment. A survey was developed to assess the extent to which formal marketing plans are employed, what foundation they are based on, what they contain, what metrics are used and upon what basis funds are divided among needs. The results should not be considered scientifically valid as the respondents self selected, but some the answers did yield useful information.

After creating the survey using Survey Monkey software, a link was sent to three different list servs: Association of Jesuit Colleges and Universities communicators list, the PIOnet list sponsored by Newswise/ProfNet, and the Council of Independent Colleges public relations list. These are lists that are regularly monitored and used to gather information. One problem with using them is that there might be more people who are public relations practitioners, magazine editors and media relations directors than those who handle the marketing function. However, many people in the field handle a mix of responsibilities. In the e-mail messages that were sent, it was requested the survey link be sent to the chief marketing officer. It was stated the survey was part of academic research and had no commercial objective and the author offered to send the results to anyone who requested them.

There are no definitive numbers on how many members collectively subscribe to the three lists, some of whom subscribe to more than one, but it was estimatedthat the number is at least 1,000. Of all those who received the request, 22 individuals completed the survey.

Results

The majority of respondents (86 percent) said their university has a written marketing plan and 43 percent of them have had a plan for between one and five years. Only two of the

respondents (9.5 percent) said the instituion has had a plan for more than 10 years. This validates the assumption that offices are working toward establishing formal working documents. The vast majority of the respondents indicated their plans are updated at least yearly if not more often.

One challenge marketers in an academic setting face is the lack of stated plans, goals and objectives by either the institution as a whole or individual academic units upon which a marketing plan would logically be based. It is not that these plans don't exist, but that a tradition of operating in silos keeps the information from being shared. In many cases, an academic division or department might have data that would be very helpful to the marketers, but simply doesn't realize the potential benefits of sharing. Some of this likely stems from references earlier in this document to the misconception that marketing equals advertising so they might not understand that data on current students or trends in their field, for example, could be valuable.

To help determine which foundational documents marketing directors use to create marketing plans, the following question was included in the survey: Which of the following units have annual business plans to help guide your marketing plan? Advancement office, Enrollment office, Schools or colleges, Departments, Athletics , None of the above, Other.

Not surprsingly, the majority of respondents indicated that the enrollment office has a plan that informs their marketing plan (63 percent). A close second was the advancement office with 53 percent. Although a quarter of the respondents indicated individual schools or colleges have plans with an additional 15 percent mentioning departments, the wording of some answers in the comment box makes one wonder if the question was understood correctly. "Supplemental plans for departments as needed" indicates the respondent is viewing the question in light of which university areas the marketing department includes in its marketing plan, not which areas supply a business plan that informs marketing decisions.

Additional responses of note included: "alumni," "our marketing plan is based on a five-year university strategic plan" and "departments share goals but not business plans." The final answer reinforces the theory that while academic units do set enrollment goals, the idea of sharing these numbers with the marketing department is to get help in increasing inquiries rather than for marketers to be present in developing overall strategy that might include plans for future programs, the role of current programs in the "product life cycle," etc.

Elements of the Marketing Plan

Two elements were near universal components of respondents' marketing plans: 95 percent indicated their plans included institutionwide marketing goals and branding goals. Web development goals were contained in 74 percent of respondents' plans, media relations goals in 68 percent and new media/social networking goals in 42 percent. Advancement and recruiting goals were also indicated as part of marketing plans, but only 16 percent of respondents indicated inclusion of marketing goals by individual programs. Following each element, it was asked if there was a budget allocated for that element within the marketing plan. For example, while 95 percent indicated the inclusion of branding goals in the plan, only 42 percent included a branding budget. Interestingly enough, only 26 percent of respondents indicated having a market research budget.

Looking at the results of this question leads me to believe that marketing departments are viewing the marketing plans as a way to establish goals primarily for marketing elements over which they have control, such as branding, institutional marketing, the Web and media relations.

The absence of goals and budgets for individual programs seems to be a missed opportunity for partnering with academic units.

The previous reference to the "four Ps" of marketing makes it clear that promotion is only one P, but it's the P that becomes the focus of the marketing plan created by university marketing departments. It is valuable to remember that for the univeristy as a whole, the other Ps of marketing must also be addressed. Higher education marketing specialist Robert Sevier, Ph.D., offers insight into ranking the Ps. "I have long felt that a curriculum that is in-tune with the students in your marketplace is the most important marketing asset of all. Programs that are sought after by students and differentiated from those offered by your competitors are much more valuable than a better price or even a better promotions plan." (Robert A. Sevier, 2003)

Resource Allocation

One of the objectives of the survey was the question of how closesly aligned university marketers are with conventional marketing and business practices with the question, "When allocating your marketing dollars, which of the following do you base your decisions on?" The answers reflected more of a market/business oriented approach than I anticipated:
Relevance to university mission — 73 percent
Future market outlook — 45.5 percent
Market demand — 41 percent
Contribution margin of programs — 32 percent
Tradition — 27 percent
Political consideration — 23 percent
None of the above — 4.5 percent
Other: strategic plan priorities; VP presents budget and finds out how much will be received.

The Biggest Challenge

The question that yielded the most interesting results by far was the open-ended question, "What do you think is the biggest challenge in determining marketing budget allocations in a higher education setting?" The answers touched on many of the topics mentioned in the first section of this paper regarding the complexities of practicing the marketing discipline in an academic setting. Answers included:

- Prioritization: recruiting vs. advancment; traditional media vs. new media.
- Tight budgets means marketing intiatives compete with other needs, inlcuding academic programs.
- Acceptance of brand marketing and managing under a business model.
- Fair allocation: Most often, the departments which generate the most revenue will get the largest amount of dollars.
- Lack of strategic marketing background among senior administration.
- Decentralization and rapid change.
- Not enough resources for market research, so decisions are best guesses.
- Working in an integrated fashion.
- Getting all of the departments and schools to buy into one strategy; see past their own immediate demands and buy into how their demands fit into and are prioritized within the big picture.

- POLITICS
- The diminishing impact of traditional media.

Conclusions

As mentioned earlier, the survey sample is extremely small and respondents self selected, which indicates they likely have a high interest in this topic and might be working on marketing-related challenges at their own institutions. As such, one would not want to extrapolate these answers to the entire population of university marketing officers. The majority of these responses came from universities with 6,000 or fewer students and are private universities. One could hypothesize that larger universities with larger marketing departments might take a more qualitative approach, are more results driven and include budgets earmarked for specific marketing activities. The next step in this research would spend more time analyzing university Web sites looking for names, titles and e-mail addresses of chief marketing officers and send them a direct request and link to the survey. This should improve the response rate.

One of the primary challenges for academic marketers, and one that also exists for many corporate marketers, is the lack of adequate rescources — human and financial — available for marketing activities. In an environment of scarce resources, it becomes imperative to use each dollar wisely. Through the research conducted for this study, the author had hoped to uncover simple, neat formulas that would allow me to examine the current allocations of marketing dollars in my department and making any adjustments based on sound quantitative measures. Although it's not that easy, a look at best practices in a corporate setting can provide useful tools for auditing our decision-making processes.

IV. Budget Development and Allocation

A review of marketing literature shows that a standard component of a marketing plan is a detailed budget. Several key methods can be used to arrive at an appropriate budget, and to allocate resources among products or programs within that budget. As such, I found it surprising that my survey respondents did not reference many specific budget components in their marketing plans.

Several methods for determining an appropriate overall organizatioal marketing budget seem to be common. *The Successful Marketing Plan* describes three. (Hiebing Jr & Cooper, 2003) 1.) Task Method: The budget is based on estimates of how much funding is required for each marketing activity outlined in the plan. 2.) Percent-of-Sales Method: The budget is based on percentage of overall sales. The text suggests that by examining marketing spend of competitors an industry standard will emerge. 3.) Competitive Method: The budget is based on trying to meet or top the budget of competitors.

In addition to these three methods, Allen Andreasen and Philip Kotler suggest two additional approaches in a text directed toward marketing for nonprofit organizations. (Kotler & Andreasen, 1996). 1.) Affordable Method: The organization bases the marketing budget on what it thinks it can afford. This is similar to the survey respondent who said she proposes a budget to the president and the board and then finds out what she will receive. 2.) Response Optimization Method: In this method, the marketer uses quantitative formulas to estimate marketing response at alternative budget levels to find the optimal level of response for dollars spent.

While any of the above methods could conceivably be used to ascertain a university's marketing budget, Kotler and Andreasen suggest three steps an organization should undertake prior to the budget stage that could propose varying levels of challenge for the university marketer.

The first step is to estimate the size of current demand and compare sales to the industry to determine whether market share is improving or declining. For a university to be effective at this step, it must clearly define the type of prospective student it is trying to recruit and agree on the institutions that are in its competitive set. This is easier said than done. This process must be repeated for each major recruiting segment. Institutions competing for first-time college students may not be the same as those competiting for MBAs, for example.

The second step is to estimate future demand using "any combination of six forecasting methods: buyer intentions survey, intermediary estimates, expert estimates, market tests, time-series analysis or statistical demand analysis." (Kotler & Andreasen, 1996) One challenge in many academic environments is that there is no individual or function is charged with looking toward future demand for existing or potential academic programs. Recruiters in the admission office who show extra initiative may seek out macroenvironmental information to predict possible numbers, but this doesn't appear to be common. At our University, our enrollment management firm provides funnels that show how many inquiries are needed to convert to a targeted number of applications that yield a targeted number of enrolled students. However, this final target number appears to be derived more from the numbers needed to achieve university budgeting goals rather than from an examination of the potential market.

The third step is to choose between alternate products or programs for which the authors suggest using a cost/benefit analysis. For the nonprofit organization, they acknowledge that nonquantifiable benefits should be taken into account along with financial benefits. While this information is meant to aid in choosing one course of action over another ("A university is trying to decide between building some badly needed dormitories and building a badly needed student union." (Kotler & Andreasen, 1996)), it seems to be one potential quantifiable method to try to arrive at allocating marketing dollars among the various programs, including academic programs. As mentioned in the survey results section, 32 percent of respondents indicate they base their decisions in part on the contribution margin of programs.

The prospect of using a concept such as this for marketing purposes, which in its normally accepted definition includes decisions about which "product" an organization offers, is likely one reason faculty and academic administrators feel uneasy about marketing. Indeed, the Wikipedia entry on "contribution margin" includes the following information: "Given the contribution margin, a manager can easily compute breakeven and target income sales, and make better decisions about whether to add or subtract a product line, about how to price a product or service, and about how to structure sales commissions or bonuses." (Contribution Margin) Some may read between the lines and arrive at the decision that marketers who use contribution or profit margin calculations when allocating marketing dollars will next recommend that academic programs that don't turn enough of a profit should be eliminated. In some cases this may be true, but it is highly unlikely that a university would eliminate a major that is central to its mission or that is a foundational discipline of the business school, for example.

To base marketing allocations among programs — especially academic programs — on cost/benefit analysis or a contribution or profit margin calculation requires time, resources and effort that are often hard to come by in resource-challenged environments. When evaluating the benefits of the program, for example, Kotler and Andreasen suggest that three groups naturally

emerge: monetarily quantifiable benefits, nonmonetary quantifiable benefits and nonquantifiable benefits, such as amount of happiness created or fear relieved. The first group is fairly straightforward. A look at the profit margin per credit hour and the future market of qualified students can yield a reasonable estimate. The second group might consist of number of alumni who would eventually be counted as a result of the addition or strengthening of a program. The last group is the most subjective and hardest to measure. It could include enhanced value to the university's brand if the academic program is meaningful to the mission, even if it doesn't attract vast numbers of students or yield a high profit margin per credit hour.

V. Rockhurst University

Many of the challenges of allocating marketing budgets cited by respondents apply to Rockhurst as well. While these may cut across organizational type and also apply to corporate or other nonprofit settings, additional research is needed to determine the best course of action. However, it seems clear that a particular set of challenges does apply to higher education in general and to Rockhurst. The list will focus on the following top five challenges. These challenges provide a framework for discussing our current situation, recommendations and likelihood of change.

Top Five Marketing Allocation Challenges

Struggling to apply more quantitatively based marketing efforts in an environment that espouses decisions by consensus and "fairness."

We have not tried to apply cost/benefit or other weighted ranking formulas to the various marketing initiatives to help guide decision about budget allocations. In the past, PRM(Public Relations and Marketing) met with recruiters for the major programs and academic deans to discuss marketing strategies and budgets and sometimes faced acrimonious debates about who should command a greater allotment. Since no additional funds are available, funds have to be reapportioned.

Recommendations: A better approach is to create a set framework for making allocation decisions then examine current proportions according to this framework. Factors that should be taken into consideration include: strategic plan priorities, accordance with the University mission, current and potential future market demand and profitability. And, while we should always work toward a collegial environment, one person (or group) must be able to make decisions based on sound marketing principles without encountering turf wars. During the past two to three years, this problem has actually lessened.

Balancing overall institutional needs, such as branding, with the needs of particular departments or academic programs.

When recruiters are held accountable for enrollment metrics and deans also have a vested interest in increasing numbers of students in their divisions, it is sometimes difficult to make a case for preserving funding for institutional marketing and branding.

Recommendations: Branding goals and accompanying budget must be established first, before funds are allocated elsewhere. According to Sevier, 30 percent of the budget should be

spent on brand marketing. Internal communications objectives should include increasing the awareness of faculty and administrators of how institutional branding can assist all programs.

Decentralization of funds available for marketing.

Recruiters and departments such as alumni and advancement have operational budgets they administer. Part of these funds can be used to supplement the funds controlled by PRM allocated toward their program. This is somewhat problematic because it means a department with extra funding could outspend a department of greater strategic importance. It also means that these departments sometimes create their own marketing materials that PRM never sees, or receives in the mail along with everyone else. This makes it difficult to standardize branding messages and images.

Recommendations: An effort should be made to educate the planning and budgeting committee to the impact centralized marketing and market budgeting could have on the institution. Efforts also should be directed toward those who control the individual budgets. PRM could partner with these individuals to learn how much they are spending on marketing, which currently is unknown. PRM could then develop a proposal for a program and projected outcomes using the entire budget if PRM directs the efforts.

Lack of assigned responsibility for assessing viability of current and potential academic programs in light of current and future market demand.

When academic programs struggle as a result of their life-cycle phase, actions of competing institutions, economic conditions or other factors, there doesn't seem to be anyone in charge of leading a discussion about next steps. Occasionally the viability of an academic program has been in question with no clear communication between the academic unit and PRM. This means that marketing efforts continue in one office while discussions about possibly discontinuing the program occur simultaneously in another office. In addition, little effort is made to determine potential markets for possible new programs, examine potential programs in light of competitive positioning, etc. The focus is primarily on existing programs and maintaining the status quo.

Recommendations: Include a senior member of the PRM team in any academic committees regarding program development and planning. It would be helpful if the executive director of marketing communication served on the Academic Affairs Council. In addition, someone in each academic unit should be assigned the responsibility of routinely researching and reporting the market share of academic programs, monitoring new programs sponsored by competing institutions and making recommendations for new programs to explore based on the macroeconomic environment. The University Planning and Budgeting Committee has begun discussions and has asked for broad input regarding possible new revenue streams, so this situation soon may improve.

Inability to differentiate institution from similar competitors.

Small faith-based institutions such as Rockhurst often promote the benefits of personal attention, academic quality, and a focus on ethics or social justice. Even many public universities have increased efforts to engage students in community service.

Recommendations: PRM is already leading an effort to clarify and strengthen the Rockhurst brand. Personal attention is emerging as a strong defining attribute, but we must discover if we do this in a way that's different from other universities, or if there are other attributes that are more particular to Rockhurst. We also have had numerous discussions about the role of "Jesuit" in the brand and how the attributes of a Jesuit education might be differentiators. We have identified next steps in the branding effort if additional funding were available and that funding is being sought.

VI. Going Forward

While this admittedly is a subjective assessment, the author believes the culture of the University has begun to change during the past two years. When the new president assumed office three years ago, he assessed the University's financial situation and was able to create a "call to duty" speech to prompt individuals and departments to work together for the greater good of the institution. The author has observed individuals step forward to make recommendations for improvement, to put in extra time and effort when staffs and budgets have been cut and, finally, to express hope about future direction.

Of the recommendations that have been proposed, the ones that will be the most challenging to implement are the centralization of the marketing budget and the determination of a unique competitive advantage. Even these are not insurmountable when considering the can-do attitude that is beginning to take hold throughout the university.

So, while Rockhurst shares many of the challenges inherent in creating and executing marketing plans within the context of higher education, we already have made progress in recent years. As we move forward, it is imperative to keep everyone focused and communicating with each other and to abandon the artificial boundaries we erect over definitions of words such as "branding" and "customer." Ultimately the goal always was and always will be to serve the student by making available an education that opens personal and professional doors. Within this framework, the possibilities are limitless.

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Employing a marketing approach to create a learning environment for engineering student

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ABSTRACT

This paper investigates the engineering student's world, special needs and attitudes – during first year academic studies – from a marketing viewpoint. It examines students' attitudes regarding textbook reading and use of Internet sites as a supportive environment for basic courses. 134 college engineering students and 94 university engineering students participated in research relating to: reading habits before and during academic studies, preferred language for textbooks (English or Hebrew), reading skills and use of on-line learning materials. Findings indicated similar reading habits for college and university students, except for use of on-line learning materials and a significant correlation between pre-academic study reading habits and reading during academic studies. More than 90% of the students clearly prefer textbooks written in their mother tongue. The students rarely used textbooks to deepen understanding of course subjects, but thought they were very important for success in the courses. They were primarily assisted by textbooks for exercise solution. University students used on-line learning materials more often in comparison with the college students.

Keywords: learning environment, marketing, mother tongue, online learning, reading, textbook.

1. INTRODUCTION

Until two decades ago the textbook was one of the essential components of any basic science course. Today students are offered a variety of learning channels and most courses are accompanied by an on-line site, which usually displays presentations that were shown in the lectures, supplementary articles, video-clips, exemplary examinations etc. Studies in many world states indicate that only a small proportion of students read textbooks systematically during their studies, in their first years of higher education, even if the textbook is written in their mother tongue (Cummings, French & Cooney, 2002).

This paper deals with the identification of special needs and preferences of a specific student population segment (Kotler & Armstrong, 2006) - engineering students. It relates to the assimilation of new materials, in light of the teaching methods employed by the academic institute to instruct the students, the improvisations that students use as a suitable response for their needs and, more specifically, relates to the way in which they are helped by textbooks during their studies for their introductory courses.

Since these needs and preferences are examined in light of the teaching methods and the absorption of new materials, the research looked at the engineering students' attitudes at the inception of their academic studies, examining their textbook reading habits and their use of other available learning materials. Additionally, the study asked: to what extent is it desirable

that the textbook or learning environment should be in the global language: English, or should it be available in the student's native language, in this case: Hebrew.

2. THEORETICAL BACKGROUND

2.1 The status of the textbook at the inception of academic studies

The typical Israeli student does not continue his/her studies in higher education institutes immediately after secondary school graduation, and only reaches higher education when most of the scientific knowledge and scientific thinking habits that were learnt in high school are barely accessible. Hence, revision is needed when beginning academic studies (Finegold & Pundak, 1990, 1991). This phenomenon is also prevalent in the USA where out of 17 million students who registered for higher education, only 18% began these studies immediately after secondary school, and more than 58% began academic studies after the age of 22 (Stokes, 2006). A study conducted by Bruning (2008) found that, in their first year of higher education, students find it difficult to read textbooks, since most of them do not have the necessary skills to organize and understand the ideas and terminology that appear in these books.

In basic science courses, an immense amount of material is learnt, and it is insufficient and unprofitable to memorise it. Students are also required to employ scientific thinking and need to be able to employ abstract thinking, in contrast to the intuitive thinking demanded in daily living (Maharshak & Pundak, 2004). For many students the heavy load of their studies reduces their ability to learn meaningfully (Runyan, 1991). For some students their independent learning time is cut back even further because they need to work to subsidise their studies. The result is that most students focus on obligatory tasks and exercises, and almost completely fail to devote time to reading that would help them to understand scientific theory and the underlying system of concepts. Their attention is directed to completion of regular assignments and they are left with little time for academic debate concerning the scientific culture for which they are being trained (Smith & Jacobs, 2003).

The way in which students understand the importance of textbooks is connected, *inter alia*, to the lecturers' approach. Many lecturers prefer an expansive approach that does not allow the reading requirements in a course to be reduced a single textbook, which contains the complete explanation of subjects to be presented during the course (Pundak & Rozner, 2007). Other lecturers apply an approach that concentrates on a single textbook and directs students to reading chapters before each lesson while they integrate selected issues from the chosen textbook within their lectures, although additional textbooks appear in the syllabus (Maharshak & Pundak, 2005; Henderson, 2008).

Research indicates that the lecturer's set of expectations regarding learning in academia contradict those of the students (Redish, Saul & Steinberg, 1998). This contradiction also exists with regard to the use of text books (Redish, 2003). While many lecturers expect that students will read chapters from the textbooks on their own initiative in order to deepen their understanding of the lecture subjects, the students only turn to textbooks when they need to cope with a task, which could not be answered after studying the notes that they wrote down in the lecture or in the lecturer's presentations (Smith & Jacobs, 2003). Research has found that students who received specific reading instructions regarding learning material that would be discussed in the next lecture, and were also tested on the learning material before the lecture, tended to study the textbooks more than students whose lecturer simply noted the textbooks at

the beginning of the course (Cummings, French & Cooney, 2002). An additional aspect of the different expectations of lecturers and students relates to the language in which textbooks are written. The development of computerised learning has led to increased use of electronic on-line books, including all the features of a printed book (Bates, 2005). Students' perceptions regarding the use of electronic books were examined by Noorhidawati and Gibb (2008). Their findings indicated that there are three ways in which electronic books are studied: searching for data and facts, finding relevant contents and broad reading of the learning material. Most students did not refer to electronic books for broad reading of the learning material but mainly used them to search for specific relevant information.

2.2 The influence of globalisation on the local mother-language-dependent culture

In the opinion of many lecturers, students who join the scientific community should converse in its language. The scientific community has created a language abundant with concepts, theories and assumptions on which the scientific dialogue revolves. In addition, the scientific community has chosen English as the language for international communication. Students should, therefore, be exposed to and recognise this language from the initial stages of their academic studies (Dada, Landsard, Cano & Salzano, 2006).

Because of the difficulty involved in learning a language which is not the student's mother tongue, a bilingual style of teaching is engendered in which there is a certain level of integration between the mother tongue and the second language. A study investigating teaching that combined a mother tongue with a foreign language (Abed & Dori, 2007) examined the perceptions of Arab chemistry teachers in Israel concerning bi-lingual teaching. The research findings indicate three levels of bilingual teaching: (a) a combination of learning materials written in Hebrew while the teaching was conducted solely in Arabic (students' mother tongue) (b) a combination of both languages in the teaching process (Hebrew and Arabic) (c) Writing scientific terms in Hebrew alongside the written term in Arabic. Each level had its advantages and disadvantages both from the viewpoint of the teacher and that of the student.

Today's global village that provides information simultaneously between all points on earth encourages migration. Prose and poetry describe experiences of migrants who were forced to migrate to foreign countries and renew their functioning using a new and different language instead of their mother tongue (Harklau, Losey & Meryl, 1999). To a certain extent, a similar experience affects the student who arrives at university having already functioned in society as an independent adult. This student is then required to converse in an unfamiliar scientific language, including many terms that are foreign to his thinking (Hobbs, Silla & Beltran, 2008). Students who have succeeded in functioning well in complex situations, prior to their academic studies, often doubt their mental ability to cope with the academic learning challenge. Textbooks present the student with a double challenge: firstly they are not written in the student's natural language, and secondly they present a world of alternative thinking that differs from that to which the student is accustomed.

2.3 Engineering Students in Colleges and Universities

During the academic year 2006/7, the student population in Israel included 66,000 college students and 63,000 university students (Central Bureau of Statistics, Annual Statistical Abstract). The university and college syllabi for the different engineering degrees are similar,

and they are supervised by the Higher Education Council (Israel Council for Higher Education, 2005). On the other hand there are differences in the policies for student entry requirements between the universities and the colleges. University entrance requirements for many of the leaning programs in engineering are higher than those of the colleges. The entry conditions in the colleges are less severe in comparison to those of the universities, but in many cases the demand for achievements at the end of the college engineering courses is no lower than that of the universities (Pundak, Herscovitz, Shaham & Weizer-Biton, 2009). As a result of this policy the dropout rate from college studies is relatively high.

In interviews conducted with university lecturers, they voiced a demand that the students should reveal ability for independent learning. According to this viewpoint the lecturer focuses on guiding the student and presenting the course subject-matter. In contrast college lecturers also emphasised a tendency to process the learning materials so that they would be more accessible for the students, and expressed commitment to instructing the students beyond the lecture hours (Johnson, Johnson & Smith, 1991).

3. THE RESEARCH PROCEDURE

3.1 Research goals

The research focused on exposing attitudes of engineering students in Israel at the inception of their studies in higher education institutions towards textbook and on-site reading in general, and textbook reading in science courses in particular.

Specific questions were derived from these general goals:

1. What were the reading habits of engineering students before they began their academic studies?
2. To what extent do students tend to read textbooks in English as opposed to textbooks written in their mother language?
3. What is the extent of importance attributed by students to the textbook during their science course studies?
4. What is the extent of influence of on-line learning materials and electronic books on the students' learning process?
5. To what extent are there differences in the consideration of the four above-mentioned research questions between engineering students in colleges and their university peers?
6. To define the needs of engineering students with regard to the assimilation of new learning materials, in light of the institution's teaching methods.

3.2 Research tools

A special attitudes questionnaire was developed for the research by staff dealing with science teaching in the ORT Braude Academic College for Engineering. The questionnaire included two parts: the first part was composed of 21 multi-choice questions, where the students were asked to choose one attitude out of the five attitudes presented for each question. These grades formed the basis for later statistical analysis. The second part included five questions, three questions dealt with the students' personal details, and two open questions asked the students to express their attitudes regarding the importance of textbooks.

The questions in the questionnaire's first part related to six categories: (a) the students' reading habits before their studies (b) reading practices during their studies (c) preferred language for textbooks (d) reading methods and skills (e) importance of textbooks for success in the course (f) integration of on-line learning materials in their learning. Table 1 below presents the distribution of the responses to the first 21 questions in the questionnaire according to the chosen categories.

Table 1: Distribution of the first 21 questions in the questionnaire according to the chosen categories, specifying question numbers belonging to each category

Number	Category	Question Number in the Questionnaire
1	Students' reading habits before commencing academic studies	1,2
2	Students reading habits during academic studies	3,4,11,14,18
3	Preference regarding language in which to learn	16, 19
4	Reading methods and skills	5, 6, 12, 17, 19
5	Importance of textbooks for success in the course	7,8, 10, 13, 20
6	Integration of on-line learning materials in the students' learning	15, 21

3.3 The research population

The questionnaire was distributed to engineering students in the first year of their studies in two colleges in the North of Israel: the ORT Braude Academic College and the Kinneret Academic College, and in the Engineering Department of the Ben-Gurion University. The questionnaire was transmitted through an on-line system. In the colleges the questionnaire was transmitted through the English and Physics course sites. The students were asked to answer the questionnaire during these courses. In the Ben-Gurion University the students were asked to answer the questionnaires in their free time.

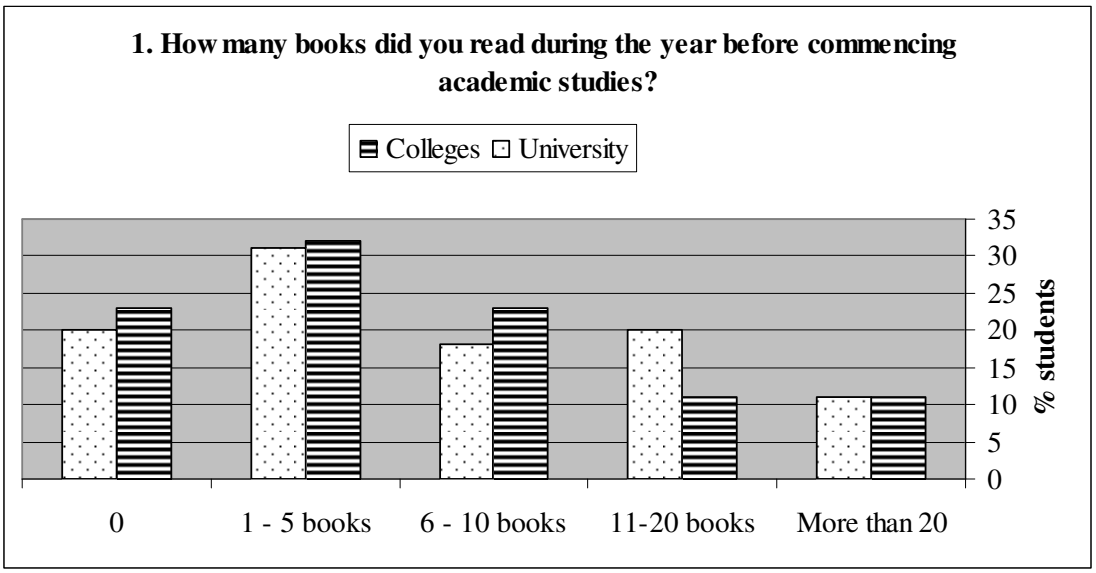
It should be noted that the percentage of responses to the questionnaires ranged between 20% at one of the colleges to 68% at the university. It can be assumed that this population is not necessarily a representative sample of engineering students, but that there may be a deviation due to the fact that this is the population that agreed to respond to the researchers' request to answer the research questionnaire. On the other hand, it is difficult to derive a clear correlation between the tendency to respond to the research questionnaire and the tendency to read. The results presented here suffer, therefore, from a certain deviation, whose influence was difficult to estimate.

4. RESEARCH FINDINGS AND DISCUSSION

4.1 Extent of students' reading habits before academic studies

Many studies have indicated that students' reading skills before beginning their studies have a strong impact on their ability to gain assistance from textbooks during their studies (Dada, Lansard, Cano & Salzano, 2006). Two research questions (1, 2) examined the students' attitudes concerning book reading before beginning their studies**.** The distribution of the students' answers to question 1 in the research questionnaire appears in Figure1.

Figure 1: Distribution of the students according to their reports regarding number of books read by them per year

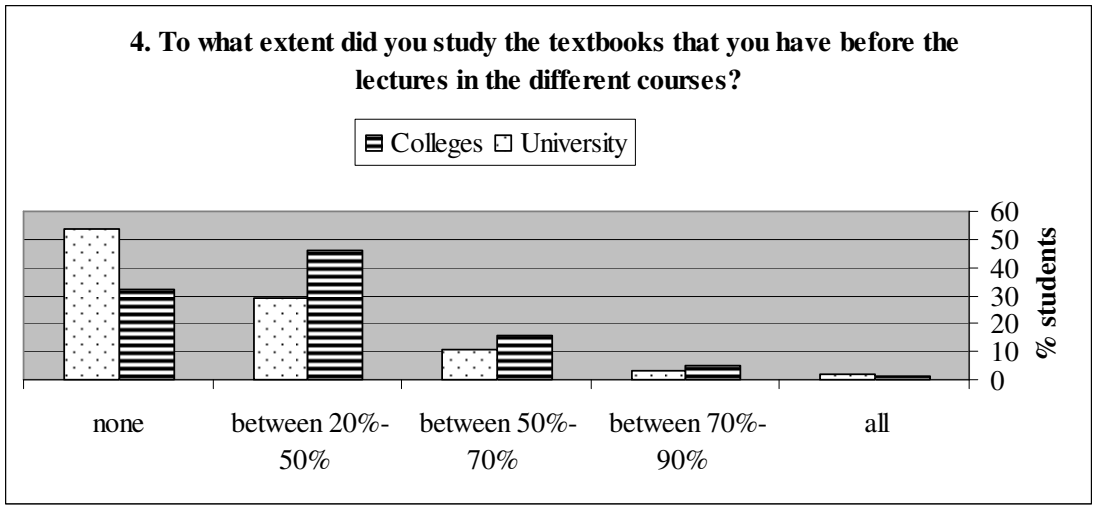


The results indicate a significant difference ($t=1.66$, $P<0.001$) between the mean extent of reading by university students ($M=3.36$) in comparison to the college students ($M=3.32$). The students in Ben-Gurion University had read slightly more on average than the college students. Nevertheless, similar trends can be noticed in the two student populations. Approximately 50% of the students who were questioned revealed a tendency to read very few books during the year or did not read books at all; while only 25% of the students read up to ten books per year and 11% read more than ten books per year. This finding is not surprising because of the strong tendency of students to prefer watching television, cellular communication, on-line communication or playing video-games as opposed to reading (Prensky, 2006). These attitudes have a very high negative correlation ($r=-0.841$, $P<0.001$) with the second question that deals with the amount of time spent in book reading. As expected the time that is spent reading books becomes shorter as the number of books that the student reads increases.

4.2 Extent of reading during academic studies

According to the findings, the typical student studies few textbooks before the lectures. The distribution of the students' extent of textbook reading in preparation for lectures appears in Diagram 2. These results were obtained in answer to Question 4: To what extent do you study the textbooks that you possess before lectures in the different courses? The results indicate a significant difference in the average level of reading before the lectures between university students (M=1.54) and college students (M=1.56) and in the t-test (t=1.07, P<0.05). The university students read slightly less on average than the college students. 54% of the university students and 32% of the college students do not read textbooks at all before the lectures. The university students read slightly less, on average, in comparision to college students. 54% of the university students and 32% of the college students do not read textbooks at all before the lectures. If the students that read partially before the lecture are added to these, then 83% of university students and a similar percentage of college students (78%) do not read or read a little in preparation for lectures. In other words, most of the students do not exploit or only partially exploit the textbooks during the science courses. These findings are supported by USA findings regarding students' reading of physics textbooks (Cummings, French & Cooney, 2002).

Figure 2: Distribution of students' textbook reading before lectures



The finding - that text books do not serve as a very important learning means for most of the studied students - is reinforced by the answers to additional research questions. From the answers to Question 11 that deals with the time devoted by the students to reading text books during a week, it transpires that close to 90% of the students read textbooks for five or less hours during an academic week. In addition, 61% of college students and 67% of university students read textbooks for less than two hours per week. There is a significant correlation between the results for Question 4 that dealt with the percentage of courses for which the students read textbooks before the lectures and Question 11 that related to the weekly amount of time for reading. According to a Pearson correlation (r=0.701, P<0.001) a significant correlation was also found between Question 11 and Question 3 that dealt with the number of textbooks studied by

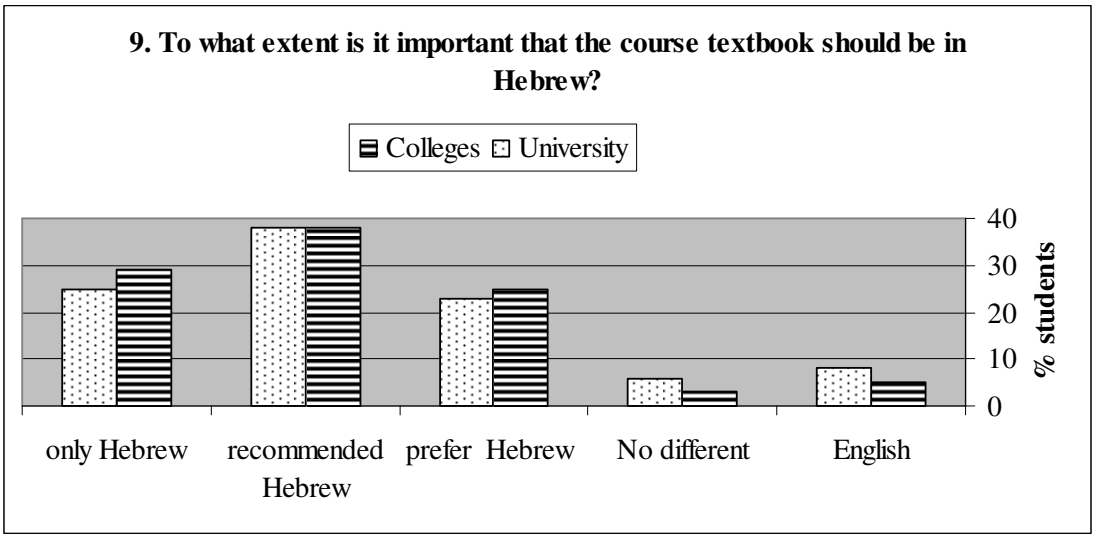
students during a semester (r=0.796, P<0.001). For all the questions that examined the extent of influence on the engineering students' learning process in higher education institutions it was found that most of the students derive only partial benefit from textbooks.

4.3 Textbook language

No significant difference was found between the tendencies of university students and those of college students regarding the language in which the textbooks were written. The studied students attribute much importance to the fact that a textbook is written in their mother tongue, Hebrew.

In their answers to Question 9, 92% of them clearly expressed this preference, as is shown in Diagram 3. Some of them (29%, 25%) [Author's note: consecutive percentages in brackets indicate results for university students, followed by results for college students] felt that textbooks in English posed a difficulty that they could not overcome. Others (38%) noted that they preferred a textbook in Hebrew. These results are in line with their preference for purchasing textbooks in Hebrew when they need to choose a textbook to buy for an academic course (Question 16). It was found that (65%, 72%) of students in universities and colleges correspondingly preferred to purchase Hebrew books. In contrast (27%, 21%) held a middling attitude according to which there was no difference whether the book was written in English or Hebrew and only 8% expressed a preference for a book in English. A high correlation was found between the students' answers to Questions 9 and 16 (r=0.616, p<0.001).

Figure 3: Distribution of students' preferences for textbook language in basic sciences and engineering courses

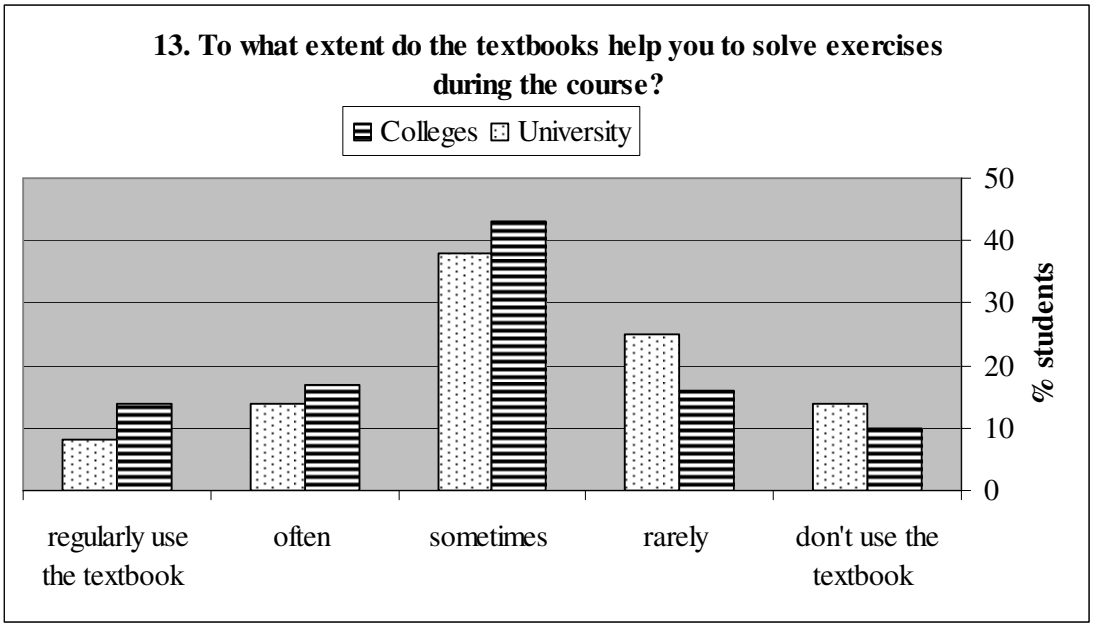


According to the research findings most of the students, both from the university and from the colleges preferred to read textbooks in their mother tongue, in the present case: Hebrew.

4.4 Reading methods and skills

Before beginning their academic studies, the students principally read 'storybooks with a plot', that included descriptions from the subjective viewpoint of the hero or the narrator. There are substantial differences between such tales and a textbook. In storybooks, the reading experience is created through a sequence of events and description of situations. There is a covert assumption that the reading will be continuous and usually continue for several days, during which the reader will succeed in remembering the main points of the story. In contrast, the textbook is addressed to the learner, who has a long process of learning ahead in a course that may continue for three or four months. During the learning process the textbook cannot be read continuously but needs to be referred to in portions, according to the lecturer's instructions, in reference to matters discussed in class, tasks that are given and during the period of revision for examinations and tests. In relation to Question 13 most of the students (58%, 79%) chose the statement that there is no similarity between reading a textbook and reading a storybook; while (13%, 20%) claimed that there is only a slight resemblance between the two types of book. The recognition of these differences is important in order to develop different reading skills in a transition between story books and textbooks.

Figure 4: Distribution of importance attributed by students to assistance from a textbook during exercise solution



There is an assumption that a textbook is intended to help the learners to construct a new system of concepts and ideas that accompany them in their future as scientists or engineers, as part of the 'toolkit' with which the academic world equips them. Of the different components of textbooks, students prefer the component of solved exercises (57%) followed by explanations and theory (35%), while the corresponding importance of the other components (formulas/OR equations, titles and illustrations) is marginal.

Figure 4 displays the distribution of students' attitudes regarding the importance of the textbook when solving exercises. There is a slight difference between the average attitude of students in colleges (M=2.79) and the average attitude of students in the university (M=2.63), regarding the importance of textbooks in solving exercises. According to a t-test, this difference was found to be significant (t=0.506, P<0.05), meaning that that even the most important assistance to students from textbooks for the solution of exercises is perceived by students as merely partial assistance. These findings are compatible with the findings of Bruning (2008) that most students at the beginning of their studies lack the necessary skills for organisation and understanding of concepts and ideas that emerge from reading a textbook.

4.5 The importance of textbooks for success in the course

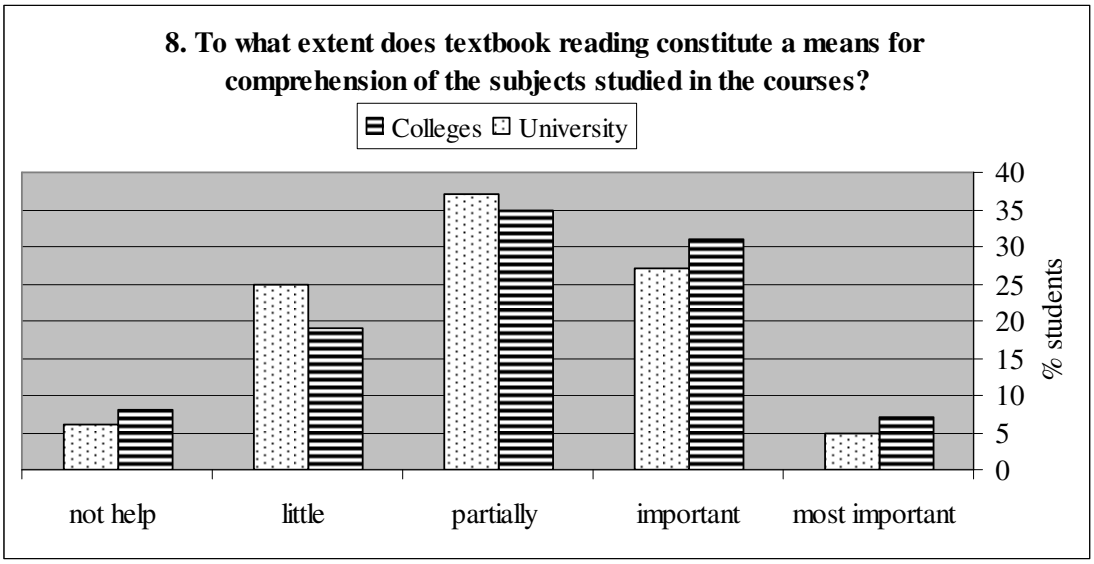
Despite the fact that most students devote little time to reading textbooks and seem to have only basic skills in textbook reading, most of them attribute importance to textbooks for their success in the course. Diagram 5 presents the distribution of students' attitudes on this subject.

Out of the students who were questioned (38%, 32%) estimated that textbooks made a very important or important impact on their understanding of subjects, while (35%, 37%) indicate only a partial impact. T-tests found no significant difference between the college students' attitudes and those of the university students for this question. A significant correlation was found between the recognition of the importance of textbooks and the students' replies to three questions:

a. The number of textbooks that the students study (r=0.628, p<0.01) in Question 3.
b. The percentage of lectures before which the students study the text books (r=0.453, p<0.01) in Question 4
c. The number of hours devoted to reading the textbooks during a week of studies (r=0.668, p<0.01) in Question 11.

In other words the textbook is seen as more important for success in their studies by those students who spend more time studying them. As was seen in the previous section, the textbook is still used primarily for exercise solution.

Figure 5: Assessment of the contribution of textbooks to understanding of subject-matter studied in science courses



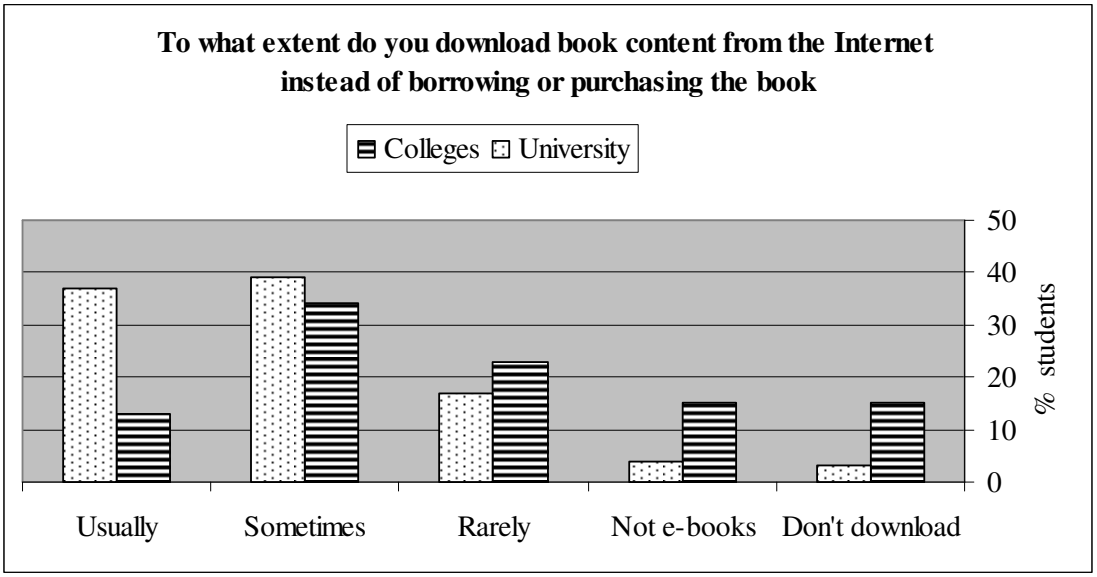
Despite the declared importance of the textbooks, a large proportion of all the students (40%) claim that reading instructions are only provided in the syllabus and only the name of the textbook appears there. An additional 42% claim that reading instructions are very general. Only 18% think that clear reading instructions are given during the course. This finding suggests a direction for solution, to improve the extent of textbook reading. Clear reading instructions are needed, and should be provided to the students by the course lecturer on a weekly basis.

4.6 Integration of on-line learning materials

Today, almost all learning materials and textbooks are available on-line, as well. Many contents can be downloaded from the Internet to help the students during the learning process. Question 15 examined the students' attitudes regarding the extent to which on-line materials helped them with the learning process. The results appear in Diagram 6 below.

There is a significant difference in the answers to this question ($t=6.70$, $p<0.001$) between the college students ($M=2.55$) and the Ben Gurion university students ($M=4.25$). Only 13% of the college students indicated that they were regularly helped by on-line materials and e-books, however in the universities the number of regular Internet users reached 37%. The results indicate a significant difference in the importance ascribed by students to the learning resources that exist on the net. While college students attribute little importance to on-line materials, despite their easy accessibility and low cost, university students attribute much importance to these materials.

Figure 6: Extent of the students' use of on-line learning materials



In order to examine whether this difference was related to the use of English language online resources, Question 23 examined the way in which students assessed their ability to read textbooks in English. A significant difference was found (t=0.883, p=0.001) between the average for college students' responses (M=3.80) and that of university students (M=4.20). However, the correlation between students' attitudes regarding knowledge of English and their attitudes concerning their use of learning materials on the net was found to be insignificant.

5. SUMMARY: A MARKETING APPROACH

The research focused on the market segment of engineering students, at the inception of their academic studies in the State of Israel. This is a clear and defined target market that copes with academic tasks by using textbooks, written in English, which is not the students' mother tongue. The research revealed the difficulties, needs, desires, preferences and attitudes of this market segment. The authors assume that engineering students' needs, in the State of Israel, are not substantially different from the needs of other engineering students beginning their academic studies in other world states, whose native language is not English. Similar studies are needed in these states and the authors intend to initiate a comparative study in other states to verify this assumption.

It is not simple to provide the necessary response to the market segment on which this research focused. The discovery of the fact that at the beginning of their studies few of the engineering students are assisted by textbooks in their own language, and consequently even less so by textbooks in English, is to a certain extent, an open secret. The authors estimate that response can be designed for this need through a synthesis of different strategies.

A student who begins academic studies, in general - and particularly an engineering student - is required to undergo changes in the transition to the academic world. Among other

things, the student is required to read textbooks in a systematic way, sine they constitute the theoretical basis for basic science courses (Hoyle, 2005). This study found a correlation between the students' reading habits in general and their tendency to read textbooks during their studies. On the other hand, the research indicates a phenomenon of students who are rarely assisted by textbooks. Moreover, a gap was found between university students who are greatly assisted by on-line sources, while only a small percentage of college students see on-line sources as a replacement for textbooks. Most of the sites on the net are written in English so that reading them constitutes a difficulty for most of the studied students. It seems that the university students were less deterred from learning that relied on a foreign language than their colleagues from the colleges, since it was found that they were helped more frequently by the online sources.

This study does not leave any doubt regarding the preferred language for studies for the students, without any distinction between university and college students. More than 90% of the questioned students preferred to read books and learning matter in Hebrew. Most of the students claimed that they have a command of English in three areas: speech, reading and writing. Their attitudes with regard to their mastery of the English language are influenced by their reasonable to high functioning in spoken English. However, reading a chapter in an English textbook requires different more complex coping skills and the lecturers' assumption that students' are helped by English textbooks is not realistic for many students.

6. RECOMMENDATIONS

Although the majority of the studied students do not read very much, most of them saw the textbook as a significant component of the academic learning environment. In the researchers' assessment, in order to improve this situation a combination of solutions should be used that would include the following components:

1. A lessening of the study load that a learning program creates so that the student would have reasonable time available for reading.
2. Guidance for the student by the lecturer to essential defined reading excerpts in order to enhance the student's level of thinking and comprehension.
3. Creation of the right combination of English and Hebrew textbooks, so that the student will know the essential components and concepts in a course presented in the student's mother language.
4. Inclusion of an assessment component based on examination of textbook reading through short tests in the grade for the course.
5. Investing efforts to translate into Hebrew and edit the books and sites that accompany each basic engineering and science course.
6. Development of an Internet site to accompany the textbooks and present parts of it on the net. This site would help the students to access the subjects they wish to learn, enabling quick reference to concepts that are difficult to understand, presenting links between concepts and theories.

An integrated effort according to the six lines of action indicated here could enable systematic learning, in order to improve understanding of the concepts and theories at a high academic level, and enhance the self-learning component with increased use of textbooks and on-line learning sources.

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Appendix A: Research on the Subject of Textbook Reading of Sciences and Engineering Students

1. How many books did you read during the year before commencing academic studies?
   a. More than 20 books
   b. 11-20 books
   c. 6-10 books
   d. 1-5 books
   e. I do not read books
2. What amount of time do you usually devote to reading a book?
   a. 2-3 days
   b. About a week
   c. Two weeks
   d. A month
   e. Irrelevant, I don't read books.
3. How many textbooks have you looked at this semester?
   a. More than 6
   b. 4-5
   c. 2-3
   d. One
   e. I am not helped by textbooks for my studies.
4. To what extent do you study the textbooks that you have before the lectures in the different courses?
   a. I study textbooks that I have before the lectures in all the courses that I study
   b. I study textbooks that I have before between 70%-90% of the lectures
   c. I study textbooks that I have before between 50%-70% of the lectures
   d. I study textbooks that I have before between 20%-50% of the lectures
   e. I do not study textbooks before the lectures
5. What extent of importance do you attribute during the reading of textbooks to the illustrations that appear in the textbook?
   a. The illustration in the book are usually unimportant
   b. The illustrations in the book have little important for comprehension of the studied subjects
   c. The illustrations in the book have only partial importance for comprehension of the studied subjects
   d. The illustrations in the book are very important for comprehension of the studied subjects
   e. The illustrations in the book have supreme importance for the comprehension of the studied subjects, often more than the written text.
6. What extent of importance do you attribute during textbook reading to the formulas and mathematical expressions that appear in the book?
   a. The formulas and mathematical expressions are usually unimportant
   b. The formulas and mathematical expressions usually have only slight importance
   c. The formulas and mathematical expressions have only partial importance for the comprehension of the studied subjects

   d. The formulas and mathematical expressions are very important for the comprehension of the studied subjects
   e. The formulas and mathematical expressions have supreme importance for the comprehension of the studied subjects, often even more than the written text.

7. To what extent is it clear to you which chapter(s) you are supposed to read before the lecture?
   a. The lecturer presents the chapters required for reading before each lecture
   b. There are clear instructions for the chapters I have to read on the course site
   c. There are general instructions regarding the chapters I have to read on the course site
   d. There are instructions in the syllabus regarding the chapters I have to read according to a timetable
   e. The syllabus shows the textbooks I have to read
8. To what extent does textbook reading contribute as a means for comprehension of the learning subjects in the courses?
   a. The course book is the most important means (more than lectures, exercises, the course site etc.)
   b. The course book is an important means alongside other learning environments
   c. The course book is a learning means that is partially helpful for my studies
   d. The course book helps very little in my studies
   e. The course book does not help me in my studies
9. To what extent is it important that the course textbook should be in Hebrew?
   a. It is unimportant; English is the professional language that I have to read to understand the studied subjects.
   b. It is only slight important
   c. Its comfortable for me to read textbooks in Hebrew but I can manage with an English textbook
   d. A textbook in Hebrew helps me to learn more meaningfully than a textbook in English
10. To what extent do examples of problem-solution that appear in the text books help you to understand the course subjects?
   a. The problem-solution examples in the textbook are very important for comprehension of the course
   b. The problem-solution examples in the textbook are important for comprehension of the course
   c. The problem-solution examples in the textbook have little importance for comprehension of the course
   d. The problem-solution examples in the textbook have no importance for comprehension of the course
   e. I don't look at the problem-solutions examples in the textbook
11. What amount of time do you usually devote to textbook reading during the week?
   a. More than 10 hours
   b. 6-9 hours
   c. 3-5 hours
   d. 1-1.5 hours
   e. I don't study textbooks

12. To what extent do you relate to points that you did not understand during your textbook reading
    a. Although the textbook is intended to clarify things, I don't tend to relate to points I don't understood
    b. I rarely notice points that I don't understand in the book and I don't relate to them
    c. I rarely notice points that I don't understand in the book and I take a note of them
    d. I sometimes notice points that I don't understand in the book and relate to them
    e. I often notice points that I don't understand in the book and tend to relate to them.

13. To what extent do the textbooks help you to solve exercises during the course?
    a. I don't use the textbook to help me solve exercises
    b. I rarely use the textbook to help me solve exercises
    c. I sometimes use the textbook to help me solve exercises.
    d. I often use the textbook to help me solve exercises
    e. I regularly use the textbook to help me solve exercises
14. Do you read books and articles in areas connected with the course in addition to the designated textbooks that appear in the syllabus
    a. No, I don't read beyond the compulsory requirements
    b. I rarely broaden my reading beyond the compulsory course reading
    c. I sometimes broaden my reading beyond the compulsory course reading
    d. I often broaden my reading beyond the compulsory course reading
    e. I always broaden my reading beyond the compulsory course reading
15. To what extent do you download book content from the Internet instead of borrowing or purchasing the book?
    a. I don't download materials from the Internet
    b. I am not helped by e-books, which have been downloaded from the Internet.
    c. I rarely download or receive textbooks from the Internet
    d. I sometimes download or receive textbooks from the Internet
    e. Usually the textbooks that I study have been downloaded from the Internet
16. In the course bibliography list there is a textbook in English and a textbook in Hebrew. If you only intend to purchase one book, which of them will you choose?
    a. The English textbook
    b. The decision depends on the price of the book, if the English book is less expensive I will buy it
    c. I cannot decide beforehand I have to see the books before I buy them
    d. In most cases I prefer to buy a textbook in Hebrew
    e. The Hebrew textbook
17. To what extent are you helped by titles of chapters, section and sub-sections that appear in a book in order to choose and focus on the subjects that you read?
    a. Titles of chapters and sections are very important when I choose and focus on my reading of different subjects
    b. Titles of chapters and sections are important when I choose and focus on my reading of different subjects
    c. Titles of chapters and sections are important to a certain extent when I choose and focus on my reading of different subjects

d. Titles of chapters and sections have little importance when I choose and focus on my reading of different subjects
e. Titles of chapters and sections are unimportant when I choose and focus on my reading of different subjects

18. To what extent is textbook reading similar to storybook reading
    a. The way in which a textbook is read is very similar to the reading of a storybook
    b. The way in which a textbook is read is somewhat similar to the reading of a storybook
    c. The way in which a textbook is read is only slightly similar to the reading of a storybook
    d. The way in which a textbook is read is not at all similar to the reading of a storybook
    e. I don't read books
19. To what extent can a textbook be read from the middle without reading the previous chapters?
    a. It is impossible, in order to understand the discussed issues I have to begin from the beginning and read the chapters according to their order
    b. It is very rarely possible, only when each chapter is written as almost independent without relying on the previous chapters
    c. It is sometimes possible, only when each chapter is written systematically
    d. It is often possible, when I understand the learning subject-matter and the chapter helps me with certain issues that I want to study more deeply
    e. To begin with reading from the beginning of the book is a recommended method that helps me to examine the extent of my understanding
20. Is there a connection between the models presented in the textbook in science courses and your daily experience?
    a. No. Science books present scientific models, which are unsuitable for daily reality
    b. It is rare that a scientific example found in textbooks is appropriate for daily life
    c. Textbooks include a reasonable number of examples that testify that scientific laws exist in reality
    d. In fact most of the theories and laws in textbooks rely on reality that describes my daily life
    e. Science books are the reality, they are founded on it and everything written in them belongs to daily reality
21. To what extent are there Internet sites that support the use of textbooks in the science courses and enrich the learning material, such as: additional questions, solutions to questions, simulations, demonstrations etc?
    a. Each science textbook that I am familiar with has an accompanying site with enriching materials
    b. Only a small proportion of science textbooks have an accompanying site
    c. Most of science textbooks do not have an accompanying site
    d. I don't know of even one site that accompanies a science textbook
22. How many years passed since you completed your secondary school and until you began your academic studies?
    a. Less than a year
    b. 1-2 years
    c. 3-5 years
    d. 5-10 years
    e. More than 10 years

23. What is the level of your reading ability in English
    a. Limited to a few words
    b. Limited to a few sentences
    c. Reasonable – I succeed in reading several sections continuously (30-50 sentences)
    d. Good – I succeed in reading and understand several pages in English
    e. Very good – I succeed in reading books in English
24. Please indicate your sex
    a. Male
    b. Female
25. Are there textbooks in the courses you study that you prefer? If there are detail the names of the books and indicate to which course they belong.
26. If you have any remarks to make concerning the issues dealt with in the questionnaire we would be grateful if you would note them here.

Accounting students' perceptions on employment opportunities

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ABSTRACT

Understanding student perceptions of future employment opportunities is important to educators and recruiters. Knowledge of the student perceptions can be used to guide instruction, advice, and recruiting tactics. Prior research has identified that governmental accounting has a lower perceived value than public or private accounting. The current research addresses these three broad areas with a field experiment given at a small southern university. The current findings indicate that students prefer public accounting as their first choice of career while private industry accounting and working for the federal government offer desirable jobs as well. In choosing long-term career paths, private accounting and public accounting lead the way. One interesting finding reveals that the students perceive no difference in the work-life balance issues offered between public, private, and governmental accounting.

Key Words: students, careers, public accounting, governmental accounting, private accounting

INTRODUCTION

Employment opportunities abound for graduating accounting majors. According to government figures, 1.2 million jobs were held by accountants in 2004. Heading into 2014, the demand for accountants will continue to grow. Estimates show the number of accounting positions growing by 386,000 (U.S. Department of Labor). Evidence on whether the number of accounting graduates is increasing is mixed. Albrecht and Sack (2000) and a survey by the Institute of Certified Public Accountants (AICPA 2000) reported graduates are declining while a new AICPA (2005) survey is showing the number of accounting graduates to be increasing.

An increasing number of accounting graduates would be a welcome relief to many accounting recruiters. As noted in the AICPA's Private Companies Practice Section (PCPS) Human Capital Center, staffing has been the number one concern over the past ten years in the PCPS/MAP Top 5 Issues Survey (AICPA 2007). The 2007 Employment Dynamics and Growth Expectations (EDGE) Report identifies that 57% of hiring managers reported difficulty in hiring qualified staff (Robert Half International 2007). As the need for these accounting graduates increases, the perceptions of the accounting graduates themselves about future opportunities is of importance. Shivaswamy and Hanks (1985), McKenzie (1992), and Nelson et al. (2002) examined student perceptions in a variety of accounting fields while Felton et al. (1994) examined the choice of career as a charted accountant or non-chartered accountant. The intent of this paper is to supplement this limited research on student perceptions about career

opportunities. The current study is unique in its analysis through adding ANOVA in the methodological design, by surveying perceptions on initial and long-term careers, and addressing initial and long-term earnings perceptions.

The current findings indicate that students prefer public accounting as their first choice of career while private industry accounting and working for the federal government offer desirable jobs as well. In choosing long-term career paths private accounting and public accounting lead the way. One interesting finding reveals that the students perceive no difference in the work-life balance issues offered among public, private, and governmental accounting.

The remainder of this paper is organized as follows. The next section reviews literature and methodology used. Then, research results are presented. The last section presents conclusions, limitations and future research.

LITERATURE REVIEW

While recruitment of accounting graduates is competitive, there is not a direct estimate of hiring needs. As a proxy for this information the AICPA (2005) survey identified the placement of 57.15% of undergraduate and graduate accounting majors into the categories of public accounting (34.96%), private accounting (19.39%), and governmental accounting (2.8%). A large group of graduates (26%) were unidentified as to the area of accounting placement and some continued on to graduate school (17%). These findings show a strong tendency for graduates to pursue public accounting with little attention directed toward governmental accounting. This study also supports findings from previous studies on student perceptions about future career paths by Shivaswamy and Hanks (1985), McKenzie (1992), and Nelson et al. (2002). Students preferred the opportunities offered by public and private accounting. Looking to the attributes of accounting positions and students' inherent interests will help in providing insight to understanding student acceptance of jobs. The articles described in this section provide a basis for identifying student perceptions on future career options.

Research on student perceptions of job opportunities generally consists of rating job attributes. Carpenter and Strawser (1970) studied student perceptions on job attributes to help local firms to understand how they might compete with the much larger national firms in recruiting employees. They found that students ranked (1) nature of the work, (2) opportunities for advancement, (3) starting salary, (4) working conditions, and (5) job security, respectively as the top five attributes. They characterized their findings as favoring smaller local firms because the students didn't highly rank attributes believed to be favoring national firms such as, "company reputation" and "opportunity for graduate study." In fact, the highest GPA students were almost evenly split (only 5 of 9 selected a national firm) on selecting a local firm verse a national firm as a first preference. They suggest that communication of the opportunities in small firms is a key component to helping level the recruiting playing field. Schmutte (2001) had students and recruiters from national, regional, and local firms evaluate 36 employer attributes that characterized eight factors such as, personal issues, compensation, technical development, and professional development. He found that students held different views from the recruiters (many statistically significant differences from the regional and local firms) on the importance of many of the attributes. Students considered individual attributes as "support for entry level staff," "flex time scheduling" (actually fourth highest rating in that factor), "future earnings potential," "salary offered," "promotion and advancement opportunity," "opportunity to use skills and abilities," and "independence in completing work" as the top one or two attributes

for each factor. He also suggests that developing and delivering the "recruiting message" helps in competing for employees.

Bundy and Norris (1992) identified 35 characteristics used in job selection and evaluated students on those preferences with attention given to gender, age, career aspiration, and work experiences. The combined or overall results found "job security," "challenging and interesting work," "advancement potential," "employer paid health insurance," and "personalities of supervisors and co-workers" respectively as the most important attributes of job selection. Gender differences were only significantly different for specific issues as, employer paid pregnancy leave and on-site day care. Age differences were significantly different for those over 25 favoring starting salary and employer paid pregnancy leave. In career aspirations, public accounting was ranked number one by 43 percent of the students followed by private industry at 33 percent and the remaining 24 percent split their number one choice between internal auditing, governmental, graduate/law school, or other. This research generally concludes that job preference would not vary based on the major job attributes. Peterson and Devlin (1998) conducted an international study on 14 job attributes and found no significant difference between the ratings of U.S. students and New Zealand students. Top picks for the groups included "opportunity for advancement," "opportunity for self-development," and "job security."

A smaller group of researchers has used different techniques to evaluate student preferences for jobs. Felton et al. (1994) used a discriminant analysis to identify what separates students choosing careers in chartered accountancy from those who do not. The analysis revealed that over 50% of the discriminating variance related to variates of initial earnings, job market conditions, intrinsic values, and long-term earnings. In the analysis initial earnings and long-term earnings were stand alone variables. The job market factor was a variate of four variables: plentiful supply of jobs, job security, flexibility of career options, and advancement opportunities. The intrinsic value variate consisted of four variables on a statement of "I would like a job that": challenges me intellectually, have a dynamic atmosphere, allows creativity, and allows independence. The remaining discriminatory power was associated with taking accounting in high school and the cost/benefit of pursuing an accounting career. Shivaswamy et al. (1985) studied attitudes of students toward governmental accounting. Students were generally neutral in their perceptions of governmental accounting. However, lower GPA students and women rated many of the governmental accounting attributes favorably while job security was the most highly ranked attribute for governmental accounting. McKenzie (1992) revisited student perceptions of governmental accounting through a field experiment. Perceptions toward public accounting, private accounting, and governmental accounting were evaluated. The results supported the findings of the Shivaswamy and Hanks (1985). Both Shivaswamy and Hanks (1985) and McKenzie (1992) provided little information on the findings related to public and private accounting other than governmental accounting fell behind them.

To update the authors' understanding of student perceptions toward potential employers the following research question is addressed: How do students view accounting employment opportunities? The following methodology describes the basis for gaining information on all three major accounting fields.

METHODOLOGY

A field experiment was designed to identify student perceptions on the three broad areas of accounting careers: governmental, private industry, and public accounting. The experiment

was designed to manipulate which area of accounting a student would receive as an entry level position. The experiment also included survey items designed to gather information on demographics, the students' first choice of an accounting career, a ranking of fields of accounting for the students' desirability of a long-term career, educational plans, and pursuit of certifications. The experimental statements were developed from statements addressed in prior research and particularly those by Shivaswamy and Hanks (1985) and Felton et al. (1994). Several faculty members reviewed the instrument as a pretest and found the instrument to be satisfactory. To broaden the information gathered on the field of first choice and rankings of long-term careers, governmental accounting was divided into the two sections of federal and state government. A not-for-profit firm category was also added.

The experiment was administered to juniors and seniors accounting majors at a small southern public university that offers an undergraduate business degree program but no graduate business program. Students were instructed that the experiment/survey was voluntary but that their participation was important and appreciated. To the authors knowledge no one in the surveyed courses did not complete the experiment/survey. There were a total of 58 surveys received. Surveys were considered usable for the experiment if the respondents correctly answered a manipulation check question regarding the field of accounting identified as their assigned career on the instrument. The manipulation check question was listed on the second page of the survey and stated, "Please indicate which type of entry level position you were offered at the beginning of the survey. (Please do not refer back to page 1.)" There were a total of nine unusable surveys, resulting in is a usable response rate was 84 percent.[1]

The survey consisted of 11 statements on the attributes of the entry level position. Each statement was evaluated on a Likert scale of one (strongly disagree), to five (strongly agree). Experiment statement number three was worded in a negative fashion, "This job has low potential for career advancement."[2]

The experimental design questions are evaluated with ANOVAs. The research design allows for eight ANOVA analyzes. There are four questions that are scaled together to evaluate a latent construct identified as "intrinsic values." This approach was used in Felton et al. (1994) as a construct for their discriminant analysis.[3] The remaining survey and demographic data are evaluated with descriptive statistics.

RESULTS

Descriptive Statistics

Students in the survey valued public accounting as the first choice of a career to pursue after graduation. Private accounting positions offered the next most desired positions while no students desired pursing a position with a not-for-profit organization. Table 1 provides the detailed percentages on first career selections of students. The table also gives a comparison of

[1] The small sample size causes a slight normality concern but SPSS analysis of mean values after accounting for the highest upper and lower values reveals minimal impact for normality and outliers (Pallant 2001). Group sizes are 13 respondents for the governmental subgroup, 18 respondents for the private industry subgroup, and 18 respondents for the public accounting subgroup. Fifty nine percent of the survey population was female.

[2] The question was recoded for the SPSS ANOVA analysis. The negative question was intended to keep the respondents actively reading the questions.

[3] The appropriateness of this construct was tested through a reliability analysis. The analysis revealed a Cronbach alpha of .69.

the current study to a national survey. The main differences are noted as a shift from public accounting to more interest in private accounting and careers in the federal government. However, Table 2 reveals that students desire a shift away from public accounting for a long-term career. Over 40 percent of the students feel that private industry will provide the most desirable long-term career.

Tables 3 and 4 provide information on the students' pursuits of additional education and certifications. Over 40 percent of the students intend to pursue an MBA while less than 20 percent want to pursue more specific advanced accounting degrees. This provides mixed results when compared to Nelson et al. (2002). Nelson et al. (2002)
found that the Masters in Accounting would be the most pursued additional education while only 16 percent would pursue the MBA. In both the Nelson et al. (2002) and the current study the CPA designation is identified as the most pursed certification. Nelson et al. (2002) did not survey the CFE designation but interestingly the CFE and CMA were tied in the current study with 12 percent of the respondents indicating a preference to pursue these certifications.

EXPERIMENT RESULTS

The experimental results provide an interesting analysis of how students view potential employment opportunities. For the eight experimental variables, the students perceived significant differences in only five variables. This is similar to the findings from both Shivaswamy and Hanks (S&H) (1985) and McKenzie (1992). Tables 5 and 6 provide an overview of the experimental findings.

Students consider the starting salary for public accounting and private industry positions to be comparable. Both are considered to offer higher earnings than governmental positions. In moving to long-term earning potential things change. The ANOVA analysis does identify a significant difference in the groups, but it is slightly different from the initial earnings findings. By using Tukey's HSD, public accounting careers were identified as offering higher long-term earnings than governmental positions. However, in the long-term students feel that private industry positions and governmental positions offer comparable earnings. While the S&H and McKenzie studies did not separate their research by high initial earnings and high long-term earnings a trend toward lower perceptions of the earnings available in governmental careers appears to be developing. The current study and McKenzie both identify that governmental careers are rated as offering lowering potential earnings.

Of the significant differences identified through the ANOVA analyzes, governmental careers did the best when considering non-monetary benefits. The benefits (also considered "fringe benefits") offered by governmental entities are ranked higher than private industry on mean score but not significantly different. The governmental benefits are considered significantly higher than those offered by public accounting. Governmental accounting also fairs well in job security. Although governmental careers are not mean ranked as highly as public accounting on job security the students did not perceive a significant difference between governmental and public accounting. The students did consider there to be a significant difference between public accounting and private industry accounting. This difference is expected to relate to the media presentation of large job cuts that occur in private industry.

The variable "intrinsic values" identifies that students consider public and private accounting comparably. Governmental accounting was considered to offer less opportunity for using creativity, challenging students intellectually, allowing independent work, and being an

enjoyable position in which to work than either public or private accounting. This is similar to the findings of S&H and McKenzie where approximately 20 percent of their respondents favorably rated some of these issues for governmental accounting but rated the issues much higher for both public and private accounting.

Finally, of the three non-significant findings, two interesting issues are identified. One finding is dissimilar to the S&H and McKenzie studies. The descriptive statistics from both the S&H and McKenzie studies rate the work-life balance issue high or higher for governmental accounting than those of public or private accounting careers. In the current study, no significant difference was identified between the three groups. This would have to be attributed as a great success (improvement) for public accounting. An additional interesting finding relates to the variable associated with financial security (this was not addressed in the S&H and McKenzie studies). The students perceived a difference in initial earnings between the governmental jobs and the others, considering governmental jobs to offer lower earnings. However, in a more long-term consideration of financial security no significant difference was associated to the public and private careers. This is a very good finding for the entities offering governmental positions and could be capitalized on in the recruiting process.

CONCLUSIONS, LIMITATIONS AND FUTURE RESEARCH

The current findings indicate that students prefer public accounting as their first choice of career while private industry accounting and working for the federal government offer desirable jobs as well. In choosing long-term career paths private accounting and public accounting lead the way. One interesting analysis reveals that the students perceive no difference in the work-life balance issues offered between public, private, and governmental accounting. One other interesting analysis reveals that the three groups are considered comparable in offering financial security from holding those jobs. In general, the ANOVA analyzes used in this study agree with the trend identified by Shivaswamy and Hanks (1985) and McKenzie (1992). The research shows governmental accounting lacking behind in student perceptions when compared with public and private accounting. However, governmental accounting does rank higher than not-for-profit accounting careers. This does leave the overall perception that public and private accounting holds the job attributes desired by accounting graduates.

Future research can address faculty perceptions on student employment opportunities. This will provide insight on how faculty may be influencing student perceptions through classroom comments or individual advice. Other future research could expand the sample population to a larger group. Additionally, research could evaluate the perceptions of graduates within the first couple years of holding an accounting position to identify changes in perceptions on job attributes.

Limitations of the study include the use of a single university, a small sample size, and a small sample for within group classifications in the experiment. Each of these items can limit the generalizability of the study. However, the similarity of the results to previous studies and the availability of the data make this an adequate case study representation.

Table 1 - "First Choice of Accounting Career to Pursue"

First Choice to Pursue as a Career	Nelson et al. (2002) Study (%)	Current Study (%)
Government - State/Local	4.7	4.1
Government - Federal	Combined	12.2
Private Industry	19.0	34.7
Public Accounting	65.8	44.9
Not-for-profit	NA	0
Education/Other/ No Accounting Career	9.78	4.1

Table 2 - "Long-term Accounting Career Choice"

Long-term Career Choice	Most Desirable %	Least Desirable %	Average Rank
Government - State/Local	8.2	12.2	3.22
Government - Federal	24.5	12.2	2.74
Private Industry	40.8	4.1	2.04
Public Accounting	30.6	16.3	2.53
Not-for-profit	0	46.9	3.98

Ranks are based on 1=most desirable, 5=least desirable.

Table 3 - "Pursuit of Additional Education"

Additional Education	Frequency	Percentage
Masters in Accounting	9	18.4
Master of Business Administration	21	42.9
Other	7	14.3
None	12	24.5

Table 4 - "Pursuit of Certification"

Certification	Frequency	Percentage
Certified Public Accountant (CPA)	37	75.5
Certified Internal Auditor (CIA)	4	8.2
Certified Management Accountant (CMA)	6	12.2
Certified Fraud Examiner (CFE)	6	12.2
Certified Government Financial Manager (CGFM)	1	2.0
None	12	24.5

Students were allowed to choose as many certifications as they felt they would pursue.

Table 5 - "ANOVA Results"

Variable	Mean		F-value	p-value
High Initial Earnings	Public Private Governmental	3.778 3.278 2.385	7.088	.002
High Long-term Earnings	Public Private Governmental	4.000 3.722 2.923	3.983	.025
High Non-monetary Benefits	Public Private Governmental	3.500 3.556 4.154	2.658	.081
High Job Security	Public Private Governmental	4.111 3.500 3.750	2.498	.094
Provides Desired "Intrinsic Values"	Public Private Governmental	14.057 13.500 11.091	4.887	.012
High Financial Security	Public Private Governmental	4.222 3.889 3.692	1.380	.262
High Career Advancement (this was a reversed coded question)	Public Private Governmental	3.944 3.667 3.231	1.400	.257
Desirable Work-Life Balance	Public Private Governmental	3.222 3.333 3.231	.097	.908

Table 6 - "Multiple Comparisons with Tukey's HSD"

Variable	Significant Difference in Pairs		p-values
High Initial Earnings	Governmental Governmental	Public Private	.001 .052
High Long-term Earnings	Governmental	Public	.022
High Non-monetary Benefits	Governmental	Public	.094
High Job Security	Public	Private	.078
Provides Desired "Intrinsic Values"	Governmental Governmental	Public Private	.011 .045

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A research framework for studying conceptions and dispositions of mathematics: A dialogue to help students learn

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Abstract

The paper discusses the research framework used in a study investigating student and teacher conceptions and dispositions of mathematics. Conceptions of mathematics refer to views that students hold of mathematics, and what they believe is required in learning and doing it. Dispositions of mathematics refer to beliefs or tendencies to exhibit a frequent, conscious and voluntary behavior directed towards learning mathematics. The research framework for this study is depicted by two nonintersecting circles, one representing conceptions and one representing dispositions of mathematics. Each circle has six equal portions that represent indicators of a conception or a disposition. The authors suggest that the six indicators of disposition represent the pre-conditions necessary for the interaction between dispositions and their conceptions of mathematics. This interaction will be explored in the research study.

The research study utilizes mixed methods with a triangulation of data through the use of a survey design, interviews and focus groups. An exploratory questionnaire, developed using items that represent the indicators, was conducted to generate categories of responses. The results of the questionnaire reflected the need for an in-depth exploration of the indicators. Focus groups were conducted prior to modifying the indicators and categories. They are currently bein used to develop the research questionnaire. The results will be used to suggest recommendations for facilitating student learning, improving teacher preparation programs, and modifying the mathematics curricula to prepare students for the challenges of the global economy.

Keywords: conceptions, dispositions, mathematics teaching, mathematics learning, indicators

INTRODUCTION

Preparing students to live and work in a rapidly changing technological world poses serious challenges to educational systems. The demands for quantitative literacy are changing, with the modern workforce needing critical thinking, problem solving and data analysis skills in addition to the basic mathematical skills. Along with the cognitive aspects of teaching and learning mathematics, research in mathematics education is focusing on affective variables to come to a better understanding of individual learners and how they interact with their learning environment. Interest in affective variables is attributed to their impact on how students learn

and use mathematics, as well as the potential of these variables to hinder effective learning (Gomez-Chacon, 2001).

Mathematics has a public image of being a difficult subject, accessible only to the few. Learners who do well in mathematics are typically stereotyped as "nerds". Mathematics is generally disliked. It is seen as a dry and boring subject. Often, it evokes feelings of stress; anxiety and fear (see Zaslavsky, 1994). Furthermore, it is seen as a filter that hinders students from pursuing their career aspirations (see Ernest, 1994; National Research Council, 1989).

This research builds on a study on student conceptions of mathematics, conducted in the United Arab Emirates (UAE) (see Atallah 2003, 2004). The researchers' interest in investigating conceptions, and extending their study to dispositions of mathematics, stems from their classroom observations as mathematics educators, as well as from the mathematics education research. Student conceptions of mathematics affect the quality of their learning (Frid and White, 1995). These conceptions are influenced by the students' classroom experiences (Schoenfeld, 1989). In addition, student dispositions towards mathematics are one of several factors that affect student learning (NCTM, 1989). Thus, the way students see mathematics and what they believe it to be affects the way they approach it as a subject and how they react in the mathematics classroom. Furthermore, teacher conceptions of mathematics influence their teaching approaches (Kuhs and Ball, 1986). Teacher conceptions are influenced by their own dispositions towards the subject being taught (Damon, 2005).

STATEMENT OF THE PROBLEM

This paper discusses an on-going research study that investigates student and teacher conceptions and dispositions of mathematics. Conceptions of mathematics, as adapted from Oaks's (1994) definition, refer to views that students hold of a subject, and what they believe is required in learning and doing it. Dispositions of mathematics, as adapted from Katz's (1993) definition, refer to beliefs or tendencies to exhibit a frequent, conscious and voluntary behavior directed towards learning a subject.

Conceptions and dispositions exist in a symbiotic relationship. While seeking to explore student and teacher conceptions and dispositions of mathematics from a UAE perspective, the researchers believe that these themes are global, and that mathematics educators in different parts of the world share related concerns. These conceptions and dispositions influence student learning in a mathematics classroom. Thus the researchers' interest in an international dialogue to share experiences, insights and strategies to come to a better understanding of the relation between student and teacher conceptions and dispositions of mathematics.

The study addresses the following questions: (1) What are student/teacher conceptions of mathematics as a discipline? (2) What are student/teacher conceptions of the application of mathematics in everyday life? (3) What are student/teacher conceptions of the links between mathematics and its applications in the work environment? (4) How do student/teacher conceptions towards mathematics influence their dispositions of how to learn/teach the subject? (see Atallah, Bryant & Dada, 2009).

Overview of Conceptions and Dispositions

Thompson (1992) refers to conceptions as mental structures that encompass beliefs, concepts, meanings, propositions, mental images and other. She suggest that the distinction

between conceptions and beliefs is not "a terribly important one" when talking about teacher conceptions of mathematics as a discipline and teacher beliefs about mathematics (Thompson, 1992, p. 130). Studies on teacher conceptions and beliefs have focused on describing teacher beliefs and conceptions, on examining the relation between teacher conceptions and instructional practices, or on changing teacher conceptions of mathematics (Thompson, 1992). Andrews and Hatch (2000) suggest that the literature on conceptions is not clear because different researchers offer different perspectives on conceptions in terms of having cognitive and/or affective dimensions. Oaks (1994) describes conceptions as views that students hold of mathematics and what they believe is required in learning and doing mathematics.

Damon (2005) describes dispositions as traits or characters that lead a person to follow certain choices or experiences. Damon views dispositions as having a major impact on who we are and who we become. According to the National Council of Teachers of Mathematics [NCTM] (1989, p. 233), a mathematical disposition refers to "a tendency to think and act in positive ways". Katz (1993) defined the term dispositions as a "tendency to exhibit frequently, consciously and voluntarily a pattern of behavior that is directed to a broad goal". Raths (2001) views dispositions are closely related to skills and practices.

RESEARCH FRAMEWORK

The research framework that emerged from the literature review, as well as from the researchers' perspectives, included the identification of six indicators for each of the conceptions and dispositions. Each of the two sets of indicators form a circle with six equal parts. The research framework diagram depicts two non intersecting circles, one representing conceptions and one disposition (see Diagram 1). The indicators have been modified based on the results of the first stage of the study, where an open ended questionnaire and focus groups where conducted with undergraduate students at a university in the Arabian Gulf region. The exploratory data collected and analyzed to-date suggests a dynamic interrelationship between conceptions and dispositions as well as sections within each of conceptions and dispositions. Further analysis will continue to shed light on the interactions among and between the two.

The six modified indicators of conceptions of mathematics are:

C1 Describing what mathematics is – ideas or thoughts about the nature and origin of mathematics (science) e.g. invented or created), (absolute or relative), (static or dynamic), (numbers and rules, patterns, logical process …)
C2 Drawing what mathematics is – one's mental image of the subject
C3 Describing what is required to learn mathematics outside the class
C4 Describing what in-class activities help one learn mathematics
C5 Describing the purpose of learning mathematics
C6 Describing when thoughts about the mathematics concept under study come together i.e. when is it understood

The six modified indicators of dispositions of mathematics:

D1 Describing one's own ability in mathematics as a learner
D2 Describing one's attitudes towards mathematics i.e. feelings, emotions, interests
D3 Describing what will mathematics helps one achieve
D4 Describing the learning approach used to study mathematics
D5 Describe the perceived value of mathematics i.e. the public image
D6 Describing the evidence that proves one's learning of mathematics

Conceptions Indicators

A review of the literature presents several views on describing student and teacher conceptions of mathematics. Some research on conceptions of mathematics focuses on the nature and functions of mathematics as well as views on how one learns mathematics. In their study on teacher and student conceptions, Frid and White (1995) and White and Frid (1995) include questions related to the origins of mathematics and whether it was discovered or created. In their study on student conceptions, Grouws et al. (1996) includes items related to the nature, structure and status of mathematics and mathematical knowledge. Gibson (1994) uses a writing exercise to examine student conceptions of mathematics. Amongst other things, Gibson asks students to list words or phrases to describe mathematics, and to complete a sentence that is a metaphor for what mathematics is most like. In this study, the researchers identified the indicators C1 and C2 to addresses student views on the nature of mathematics. While the C1 indicator is reflected in writing, the C2 indicator is reflected in drawing. Some are better able to express their thoughts in drawing as they may have more visual learning styles. Furthermore, imagery reveals underlying beliefs, assumptions and expectations (Henrion in Picker and Berri, 2000).

Frid and White (1995) and White and Frid (1995) also included questions related to factors that facilitate the learning of mathematics, and specific mathematics teaching and learning experiences. Grouws et al. (1996) included items on the nature of mathematical activities. In this study, the researchers identified the indicators C3, C4 and C6 to reflect the relation between learning and doing in mathematics where knowledge and skills are complimentary.

Frid and White (1995) and White and Frid (1995) also addressed questions related to the purpose of studying mathematics and why it is included in school programs. Grouws et al (1996) used items related to the usefulness of mathematics. In this study, the researchers included the C5 indicator to reflect the purpose of studying mathematics.

Dispositions Indicators

Perkins and Tishman (1998) use the term disposition to refer to a predilection to exhibit a behavior under certain conditions. They suggest that dispositions involve sensitivity, inclination and ability. Sensitivity concerns awareness to the environment. Inclination concerns motivation or learning. Ability concerns capability to follow through appropriately. In this research, the inclusion of indicator D1 reflects the ability to learn. The inclusion of indicators D4 and D6 relates to the behavioral aspect of a disposition included in the definition.

In a study on fostering student dispositions, Anku (1996) uses change in attitudes before and after the experimental treatment as an indicator of the disposition. Bonnstteter's (2003) research uses three types of instruments for measuring teacher dispositions – one that measure observable behavior and emotions, one for attitudes and values, and one for soft skills. Osborne et al (2003) discuss attitudes towards a subject (in this case science) as encompassing feelings, beliefs and values related to the subject. NCATE defines dispositions, amongst others, as values, that influence behavior and affect student learning. Howes (2002) defines teacher dispositions towards science as outlooks, attitudes, and expectations concerning one's relationship with science, as well as toward learners. In this study, the indicator D2 was included to address

attitudes related to mathematics. The indicator D5 was included to address perceived values of mathematics, and the indicator D3 was included to address expectations regarding mathematics.

Conceptions and Dispositions

The authors suggest that the six indicators of disposition represent the pre-conditions necessary for the interaction between dispositions and their conceptions of mathematics.

METHODOLOGY

Participants

The participants at the exploratory stage of the research study were undergraduate students from different areas of specialization at a public university in the United Arab Emirates. At the next stage, the participants will include high school students, undergraduate students from other public institutes of higher learning as well as school, college and university mathematics instructors.

Procedures

The study utilizes qualitative and quantitative procedures, with triangulation of data through using questionnaires, interviews and focus groups. The study also emphasizes the development of reliable and valid instruments to measure student and teacher conceptions and dispositions of mathematics. The research process is iterative in nature and includes a review of literature, designing the exploratory and study questionnaires, data collection and analysis, results and recommendations, research disseminating and cross-cultural extension. Currently, the researchers are in the process of designing the research instruments using the results of the exploratory questionnaire. This process feeds into modifying the research framework and generating categories for the conceptions and dispositions indicators. These categories are used to construct the items included in the study questionnaire. This questionnaire will be piloted prior to conducting it on-line.

PRELIMINARY RESULTS AND DISCUSSION

Results from the data analysis of the exploratory questionnaire reflect the need for a more in-depth examination of some indicators and their corresponding questionnaire items. Furthermore, the categories generated for some items appear too dispersed. Some items required further investigation such as the one on problem solving processes. Even with the focus group approach, it was still evident that students have misconceptions about the nature of problem solving and what it involves in mathematical situations. For the most part, these students equate problem solving to finding the correct answer to an exercise or exam question.

Two focus group sessions were carried out following the exploratory questionnaire. An interesting observation stemmed from comparing answers of both focus groups. The differences between the group enrolled in a third year Learning Technologies course, which comprised students from different education majors (Early Childhood Studies, Primary Mathematics and Sciences Studies, Mathematics Studies , Social Studies, English Studies, Art Studies, and

Technology Education Majors) and the group enrolled in a second/third year Mathematics Teaching Methods II course, which included both Primary Mathematics and Sciences Studies and Mathematics Studies, seem to suggest a connection with the major course of study. For example, in the Learning Technologies group, some answers for an item on studying reflected a reliance on language strategies for learning terms rather than concepts (syllabus, stories,). This issue will be further explored in the main study.

The researchers have used the data analysis results to review and modify the indicators as well as the categories. We are in the process of constructing and piloting the study questionnaire. This questionnaire will be followed up with other focus groups and interviews. While providing valuable data, focus groups do not always provide the in-depth perspectives needed on truly understanding conceptions and dispositions towards learning math. Interviews may shed further light on understanding these complex and sometimes interrelated issues. Because of the complex nature of the human mind where conceptions and dispositions lie, any type of investigation must analyze the interrelations between conceptions and dispositions, and the connections within and between them.

FUTURE PERSPECTIVES

The study results will be used to suggest recommendations for facilitating student learning, improving teacher preparation programs, and modifying the mathematics curricula to become more relevant to the challenges of the global economy. As concerns relating to mathematics education are shared by mathematics educators across the world, the authors are interested in cross cultural studies that explore conceptions and dispositions of mathematics as well as the relationship between them, and its implications for the teaching and learning of mathematics.

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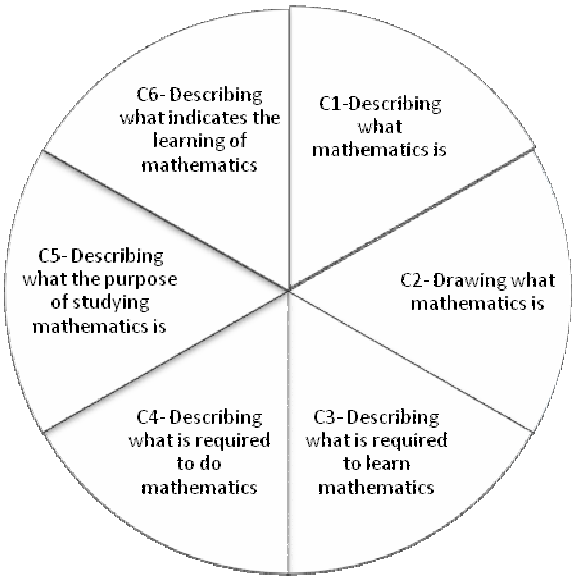
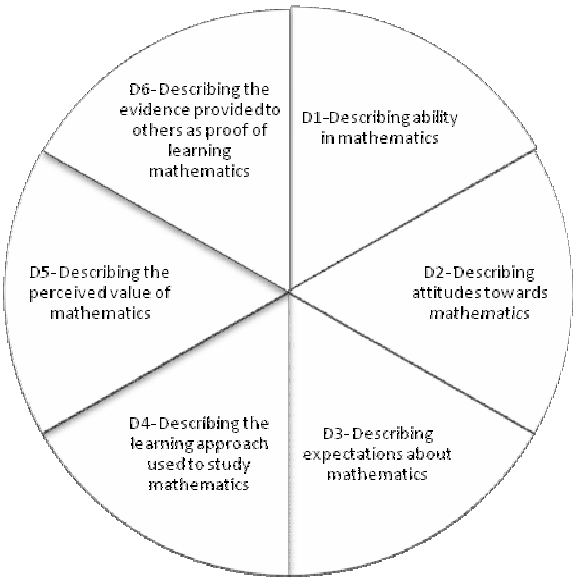
Diagram 1: Research Framework on Mathematics Conceptions and Dispositions



Conceptions Indicators



Dispositions Indicators