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Competence of Faculty, Staff, and Administrators in Hispanic Culture: Evidence from Three Surveys of Personnel and Students at Hispanic- Serving Institutions

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Abstract: Best practice in the field of communication, especially intercultural communication, emphasizes seeking to understand and enter your interlocutor's perspective. This practice would seem directly applicable to college faculty and staff when they interact with students, especially given the cultural and ethnic diversity in college student populations. Yet, faculty and staff can operate with substantial autonomy when interacting with students and there are few means of monitoring cultural responsiveness in their conversations. Because of this, little is known about the actual cultural competence of college and university personnel. Information about competence, in respect to Hispanic culture, of college and university faculty, staff, and administrators at Hispanic-Serving Institutions (HSI) was gathered as part of an NSF-funded investigation that focused on the characteristics and programming of HSIs as well as the background and experiences of their students. A minimum of 44 HSIs in Texas, New Mexico, and Colorado were represented in the 403 usable responses gathered from faculty, staff, and administrators. Fourteen HSIs in New Mexico and Texas were represented in the student survey data gathered in 2018 and three in north Texas in the survey data from 2019. Responses from 213 Hispanic students were isolated from the 2018 student survey and 307 from the 2019 data. This material was used to verify and expand on the FSA results. A consistent and strong difference of opinion was found between Hispanic faculty, staff, and administrators at the HSIs and their non-Hispanic peers regarding information available to higher education professionals about Hispanic culture, the elements of Hispanic culture, and the characteristics and background of Hispanic students. Student responses confirmed, at many points, that the perspective of the Hispanic faculty, staff, and administrators was accurate. It appears, based on this information, that the non-Hispanic employees at HSIs are less well informed about a major portion of their student population than would be desirable. Being better informed about Hispanic culture would make these HSI employees "more credible, empathetic, relatable, and trustworthy" (Haupt & Connolly Knox, 2018, p. 538) when working with Hispanic students. The findings, while from the south-central United States, can inform multiple academic and support services at Hispanic-Serving Institutions and other colleges and universities as they detail gaps in competence regarding Hispanic culture among faculty, staff, and administrators at HSIs and the cultural orientation of Hispanic students attending the HSIs represented in the sample.

Keywords: Hispanic-serving institutions, Cultural competence, Hispanic culture, Hispanic students

Introduction

As stated by Chun and Evans (2016) "most institutions [of higher education] have struggled to develop integrated and intentional approaches to addressing cultural competence" (p. 7). Thus "the operationalization of

cultural competence within the undergraduate experience remains an elusive and often neglected goal” (p. 7). Yet, Minority-Serving Institutions (MSI), like Hispanic-Serving Institutions (HSI) and Tribal Colleges, carry labels that seem to communicate a focus on and level of skill in this area. HSIs, though, develop in a very different way than some other types of MSIs, for example Tribal Colleges and Historically Black Colleges and Universities (HBCU). While they are all grouped as MSIs, both Tribal Colleges and HBCUs have a purposeful association with the ethos and milieu of a segment of the United States’ population as a foundational and defining characteristic. Garcia (2019) suggests this is not the case with many HSIs. It is possible that the “serving” portion of their title is primarily related to the government definition of Hispanic-Serving Institutions (Office of the Law Revision Counsel, n.d.) which is based on the percentage of enrolled students who identify as Hispanic rather than the college or university seeking to create an environment that recognizes, supports, and builds on patterns in Hispanic culture.

Since nearly two-thirds of the undergraduates in the US who identify as Hispanic attend HSIs (Revilla, 2018), knowing whether these colleges and universities are attune to a Hispanic ethos is a matter of some importance. This is the case for several reasons. First, the percentage of all Hispanic students in higher education that attend HSIs is high. Second, there are demographic shifts occurring in the United States. Hispanics are the largest segment of the US population after Whites (Flores, 2017). Population growth in this segment is faster than for all others but Asians. Hispanics are, on average, the youngest of all the US’ ethnic groups. And four US states have minority-majority populations with Hispanics as the primary minority population in three of them (California – 40%; New Mexico – 48%; Texas 39%) (Nittle, 2019). An example of the impact for higher education of Hispanics being the youngest segment of the US population is 52.4% of the students in Texas public school were Hispanic in the 2017-2018 school year (Nagy, Whallun & Kallus, 2018). Very soon, every other in-state student Texas institutions of higher education recruit will be Hispanic. Finally, student success theory has for decades emphasized cultural support for and limiting “acculturative stress” (Chun, Marin, Schwartz, Pham & Castro-Olivo, 2016, p. 385) felt by minority students. Whether the employees at HSIs, who educate and provide support services to the majority of Hispanics in higher education, exhibit competence in Hispanic culture will impact the experience and even the potential for success of this large and growing group of students.

Review of Relevant Literature

Searches of the literature were conducted regarding cultural competence on the part of college employees. A customized search function that combines outcomes from multiple education and social science databases was the primary tool employed. The primary search terms were culture, competence, and cultural competence with which faculty, staff, university, college, training, Hispanic-Serving Institutions, Hispanic, and Hispanic students were paired to focus the results.

Overview of the Literature

There is a broad interest in helping college students achieve competence navigating the variety of cultures they will encounter in their personal and professional lives. As Haupt and Connolly Knox (2018) stated, “By increasing cultural competency knowledge, skills, and abilities...our graduates...[become] more credible, empathetic, relatable, and trustworthy, and less inclined to negatively apply biases, stereotypes, and pre-conceived notions” (p.538). These are worthy goals and they are being pursued around the globe, in Europe (Kedzior et al, 2015; Koskinen et al, 2012) and the United Kingdom (Kruse, Rakha & Calderone, 2018), in Australia (Pillay & James, 2015), in Hong Kong (Bodycott, Mak & Ramburuth, 2014), and in the United States (Haupt & Connolly Knox, 2018). These efforts are occurring in a variety of academic fields including “emergency management and homeland security” (Haupt & Connolly Knox, 2018, p. 538), education (Sandell & Tupy, 2015), medicine (Swanberg et al, 2015), and nursing (Jeffreys & Dogan, 2012).

The materials located describe a variety of activities enacted with undergraduates and graduate students and outcomes of investigations. These include curricula being created (Koskinen et algreene, 2012; Garcia Oacha & McDonald, 2019) and assessed (Bodycott, Mak & Ramburuth, 2014), the impact of study abroad programming (Blankvoort, Kaelin, Poerbodipoero & Guidetti, 2019) and a “simulation game” (Bucker & Korzilius, 2015), recommendations regarding what has not worked (Chun, 2010) and what has (Pillay & James, 2015), and studies of specific interventions (Sandell & Tupy, 2015; Swanber et al, 2015). Yet, only two publications were found that addressed the cultural competence of college and university employees.

Articles Addressing Cultural Competence of Employees in Higher Education

Kruse, Rakha, and Calderone (2018) discuss cultural competency training at universities in the “UK, EU and US” (p. 733). Their description of the current state of affairs is “cultural competency efforts on campuses remain largely under theorized and diffuse” (p. 733). In response, they constructed an “agenda...highlighting outcomes of cultural competency learning and underscoring the role of campus leadership in the development of supportive characteristics” (p. 733) which they suggest as being “attention to shared knowledge, professional learning at all levels of the organization, inclusive instructional methods, integration with other campus initiatives, and inclusivity of diversity foci” (p. 733).

Only one publication was found that discussed the cultural competence of employees of an institution of higher education, faculty in a medical school. Thompson et al (2010) surveyed over 200 medical students and found “students perceive the cultural competency of their attendings and residents to be the same or lower” (p. 91) than their own. The authors felt this finding noted an “important area for future research and curricular reform” (p. 91) as faculty play a “vital role...in the education of medical students” (p. 91). The same can be said of faculty at all institutions of higher education. But, the role of administrators in setting institutional tone and policy, determining programming initiatives, and directing funding, topics included in Kruse, Rakha, and Calderone’s (2018) discussion, should also be considered as should the day-to-day interaction with staff of the institution.

Method

The research completed was a direct response to the National Science Foundation’s (NSF) request for conferences to identify critical challenges for and important opportunities in science, technology, engineering, and mathematics (STEM) education at two- and four-year HSIs. That request was communicated in the Dear Colleague Letter NSF 17-092. Dr. Preuss of West Texas A&M University (WTAMU) designed the research plan that was submitted as part of the Consejos Colectivos conference team’s application. When NSF award 17-64268 was made, he operated as a member of the conference planning team and, during and following the conference, as the lead researcher. All the members of research team were from WTAMU (see the list of authors for this paper).

The research objective of the project was to produce original and timely information about the challenges and opportunities in STEM education at HSIs focusing on 1) improving Latinx STEM education, 2) building capacity for STEM research, and 3) implementing appropriate institutional change (NSF, 2017). A sequential, mixed-methods investigation of the challenges and opportunities for HSIs in these areas was conducted beginning with literature review and focus group data gathered from conference participants and continuing with targeted interviews and survey research following the conference. A sequential exploratory pattern was deemed appropriate as there was little extant information about the topics under investigation. This made literature review and qualitative investigation then triangulation between data sources followed by validation with a larger sample the preferable approach.

As an exploratory investigation the overall research questions were broad but included foci within topic areas. This discussion addresses a specific subset of ideas, the level of understanding of Hispanic culture among faculty, staff, and administrators at the Hispanic-Serving Institutions in the sample, institutional practices relevant to communication about or accommodation of the characteristics of Hispanic culture, and responses received from Hispanic students attending HSIs about these concepts. This involves reporting findings from three different surveys conducted as part of NSF award 17-64268.

Findings from secondary research informed the investigative process from the earliest stages and data collection occurred in a variety of forms: (1) topic-specific focus groups conducted during each concurrent session of the Consejos Colectivos conference at El Centro College in February of 2018, (2) semi-structured interviews with students and representative stakeholders from groups that had been underrepresented in the focus groups, (3) a survey of faculty, staff, and administrators at HSIs in a seven-state region, and (4) surveys of students at HSIs in the seven-state region. All research materials and methods were submitted for review and approval by the Institutional Review Board (IRB) at West Texas A&M University. The informant populations were faculty, staff, and administrators from HSIs in New Mexico and Texas who attended the Consejos Colectivos

conference, representatives of Texas non-profits who advocate for or provide services to Hispanic students, and students, faculty, staff, and administrators at HSIs in a seven-state region of the south-central United States. This broadly inclusive set of informants allowed for the greatest variety of perspectives regarding each topic addressed.

Focus groups with faculty, staff, and administrators from HSIs were conducted at the Consejos Colectivos conference in Dallas at the end of February 2018. The discussion prompts for these conversations were developed based on information from the literature, input from representatives of the Texas Association of Chicanos in Higher Education (TACHE), suggestions offered by members of the conference organizing committee, and the experience of members of the research team. There were three general focus group topics and a set of questions specific to each. The question sets are included in Preuss et al (2019b).

The focus group participants were selected at random from the list of Consejos Colectivos conference registrants. The parties selected were contacted by e-mail and asked to participate in a designated focus group during one of the concurrent sessions of the conference. Thirty-seven persons were asked to participate in three focus groups. Twenty-six of them agreed to participate. They represented seven four-year institutions in Texas and New Mexico and five community colleges in Texas. The same party, Dr. Michael Preuss, facilitated all three focus groups. The focus groups were recorded and transcripts were produced.

Student participants at the Consejos Colectivos conference were purposefully excluded from the focus groups. This decision was taken for two reasons. First, students might have been intimidated by the faculty, staff, and administrators in the focus groups. This could impact their willingness to speak and the content of their responses. Second, the higher education professionals in the focus groups might have altered the topics addressed in their responses with students present. It was felt that these were sufficient reasons to exclude students. This, however, meant that to have student input in the initial stage of the research another form of data gathering was necessary. Short, semi-structured interviews were planned to fill this gap. Similar interviews were also planned as a means of filling any gaps in representation left by random selection of focus group participants. With several faculty members, staff persons, and administrators participating in each of the focus groups, the only informant gap was for advocates. Even though this was the case, a small number of interviews were completed with female administrators from HSIs as the count of female administrators in the focus groups was lower than that of male administrators.

Immediately following the conference, student, advocate, and female administrator interviewees were sought. In all cases a convenience sampling pattern was enacted. Interviewees were sought through the personal networks of members of the research team. Eight students were interviewed. One male and two females who were students at HSIs that were comprehensive, regional state universities. The remaining students attended community colleges that were HSIs. Four were male and one was a female. All the students attended college in Texas. Two advocates were interviewed. One was a male and one was a female. Both served in leadership roles for non-profit organizations. The male was a full-time employee of a non-profit in a metropolitan region of Texas. The female was a volunteer leader of a state-wide non-profit whose full-time role was as an administrator at an emerging HSI. Two female administrators at HSIs were also interviewed. One worked at a regional, comprehensive state university and the other at a community college. The interviews were recorded and transcribed.

The qualitative data, focus group and interview transcripts, were divided into two groups, input from students and material supplied by faculty, staff, administrators, and advocates. All members of the research team completed open coding of each transcript (Kolb, 2012). The student interviews, the smaller set, were coded first. When each team member had completed coding the student interview transcripts, meetings were held in which line-by-line discussion of codes was completed and a common codebook negotiated. The same process was completed subsequently for the focus group transcripts and for the administrator and advocate interviews. The result was two corporate codebooks, one representing faculty, staff, administrator (FSA) and advocate data and a second representing the student data.

The codebooks were used to develop surveys in conjunction with the Psychosociocultural Model of College Success for Latinx students (Castellanos & Gloria, 2007) and the work of Santiago, Taylor, and Calderon (2015). Sample questions were written primarily by Dr. Preuss and discussed by the group with alternative questions suggested by team members in meetings. A survey was developed for distribution to students at Hispanic-Serving Institutions in a seven state region (AR, CO, KS, LA, NM, OK, TX). A second survey for faculty, staff, and administrators at the same institutions and in the same region was also developed. The

intention for the student survey was to identify student background, experience, and opinion. The intention for the faculty, staff and administrative survey was to identify institutional commitments and characteristics, the background and experience level of as well as the programming facilitated by institutional employees, and to understand the views of the employees.

Both surveys were piloted and assessed for face validity. The student survey was piloted with a group of ten student volunteers at WTAMU and the faculty, staff, and administration survey was piloted with a small number of faculty and staff at WTAMU. The surveys were reviewed for face validity by representatives of TACHE. Both surveys were administered through the Qualtrics survey. While deployed simultaneously in the spring of 2018, the means by which participation was solicited were not identical for the FSA and student surveys. The link to the FSA survey was distributed in several ways. A broadcast e-mail was sent to over 1,500 employees at 119 HSIs in the seven-state region. This contact list had been developed by the research team using the US Department of Education and Hispanic Association of Colleges and Universities listings of HSIs for the year 2016. One team member then accessed the website of each of the HSIs and searched for STEM, student support, and administrative contacts. The result was a list of over 1,500 contacts. Thirty-one persons who attended the *Consejos Colectivos* conference had also agreed to act as “Research Champions.” These persons were contacted via e-mail and provided an IRB approved e-mail for use in soliciting survey participation from their institutional colleagues. A third means of distributing the FSA survey link was provided by the Texas Association of Chicanos in Higher Education. TACHE’s leadership distributed the survey link to their membership via e-mail. Finally, the research team asked faculty, staff, and administrators they knew at HSIs to complete the survey.

The link to the student survey in the spring of 2018 was also distributed in several ways. A second broadcast e-mail was sent using the list of over 1,500 employees at the HSIs in the seven-state region asking them to forward a survey link to students at their institutions. The 31 “Research Champions” from the *Consejos Colectivos* conference were contacted via e-mail and provided an IRB approved e-mail for use in soliciting survey participation from students at their institution and the TACHE leadership distributed the link to their membership. Finally, the research team solicited participation in the survey at WTAMU by approaching students in the dining commons and the student center.

Both surveys remained open for a three-week period at the end of the spring semester in 2018. 494 faculty, staff, and administrators accessed the FSA instrument. The research team completed an initial review of the responses and excluded 91 incomplete response sets. The remaining 403 were subjected to statistical analysis. They represent at least 44 distinct institutions in three states (CO, NM, TX). A minimum number of institutions represented is known as the FSA survey did not request the name of the respondent’s employer. This decision was taken to prevent the possibility of identifying informants should only one party respond at an institution. There were, however, individuals who completed the survey by accessing the internet from a server that was not associated with an institution of higher education. IP addresses, latitude, and longitude placed most of these persons in communities in which HSIs were found or near those communities. It was assumed they completed the survey from home or while traveling. The three individuals who completed the survey from a location outside the seven-state region were assumed to be traveling. As approximately 25% of the institutional affiliations for respondents could not be identified, the minimum number of institutions represented has been reported.

A total of 587 students at 15 colleges and universities in Colorado, New Mexico, and Texas accessed the student survey in spring of 2018. These parties were from one university in Colorado, three four-year and two two-year institutions in New Mexico, and five four-year and four two-year institutions in Texas. The research team reviewed the file and cleaned the data of inconsistent and incomplete responses which left a total of 464 usable response sets from students attending the 14 HSIs in New Mexico and Texas. In the spring of 2019, the research team revised the student survey. This involved removing some queries that had proven ineffective, adding a demographic marker, rephrasing some questions, shifting response patterns to ten-point or larger scales from select all that apply and five-point Likert scales, replacing the original familism and locus of control questions with valid and reliable question sets, and shifting the focus of a subset of questions from role models to mentors. The revised survey was deployed sequentially at three Hispanic-Serving Institutions. By the mid-fall of 2019, 830 persons had accessed the second student survey. Responses from outside the population of interest and that were incomplete were excluded from analysis. This left 746 sets of usable response sets.

Statistical analyses of responses for each survey were conducted using SPSS with methods appropriate to each form of data. The data sets could be disaggregated in multiple ways as reported in Preuss et al 2019a and 2019b. For this consideration which focuses on descriptive patterns, the primary form of disaggregation will be

separation of responses from persons identifying as Hispanic from those who did not. Further disaggregation within these groups was also possible but only completed for this paper on a limited basis and the application of the additional forms of disaggregation are noted in the text as they become relevant. The analysis process was exploratory rather than hypothesis-driven. The purpose was to identify meaningful differences in the response sets and to search for important patterns as opposed to testing a theoretical construct or the impact of an intervention. This approach was made necessary by the dearth of information in the literature describing HSIs, their staffing, patterns, practices, and programming, and their student.

Results and Discussion

In the discussion that follows, the percentages of respondents affirming characteristics of their college or university are reported for the FSA survey rather than the percentage of institutions exhibiting the characteristic. This is the case for the FSA survey since, as noted above, there were 403 usable responses which came from a minimum of 44 institutions. Approximately one-fourth of the respondents, 99 out of 403, could not be identified with a home institution although 96 of them were submitted from within the seven-state region and from communities where HSIs were located or very near those communities. Even when limited to the institutions that could be identified, responses were received from a substantial proportion of the HSIs to which the survey was sent. Forty-four colleges and universities represents 37% of the 119 HSIs in the region as of 2016. The student data sets also represent the opinions and experiences of the individuals responding and were not disaggregated to report findings specific to each of the 14 colleges and universities represented in the 2018 data set or the three in the 2019 data set.

Provision of Information about Hispanic Culture and Students

The research group believed, similar to the recommendation made subsequently by Kruse, Rakha and Calderone (2018), that “campus leadership in the development of supportive characteristics...[and] attention to shared knowledge...at all levels of the organization” (p. 733) was an important characteristic to measure. To accomplish this, a question with a stem, “My institution provides persons in my role...,” was included. There were four statements describing specific types of information and one describing a professional development topic listed as phrases to complete the stem. Informants were asked to select all that applied at their institution. Table 1 lists the five phrases used and the percent agreement among the HSI employees.

At the colleges and universities represented in the sample, one-fifth or less of the respondents reported receiving information distributed by the institution about Hispanic culture and/or the needs and concerns of first-generation, low-income, and Hispanic students. Less than 7.0% overall and less than 6.0% at four-year institutions note provision of professional development offerings addressing competence in Hispanic culture. Comparisons between responses from four-year and two-year schools found two significant differences with weak effect sizes. These occurred for information about low-income students ($p = .004$, $\phi = -.146$) and the professional development prompt ($p = .026$, $\phi = -.112$). Community college personnel reported the provision of the information and professional development at higher levels than parties from four-year institutions.

Understanding of Hispanic Culture among Employees at HSIs

Several questions were included in the FSA survey about Hispanic culture. The first of these was a thirteen-part query that asked for responses regarding one general statement, 10 cultural elements, the idea that diversity exists within the broad concept Hispanic culture, and the general assumption that Hispanic values include a common set of beliefs. Following that, a two-part question was presented asking for responses regarding the availability of information about “challenges Hispanics face in higher education” and “comparing Hispanic culture to higher education culture.” Respondents were asked, in all cases, to employ a five-point Likert scale running from Strongly Disagree to Strongly Agree to register their opinion.

A general query, “Hispanic cultural values are understood by higher education,” and the two-part question regarding the availability of information, “Actionable information is available about challenges Hispanics face in higher education” and “is available comparing Hispanic culture to higher education culture” appear on the FSA survey. Statistically significant differences were found based on ethnicity. Hispanics were more likely to disagree, with small effect sizes, with all three statements. The thirteen-part question noted above included a

group of 10 values present in Mexican-American culture, one general understanding, and one commonly held assumption. These were intended to assess understanding of Hispanic culture among the employees of the HSIs. The general understanding was that diversity exists within the broad category Hispanic culture. This diversity exists based on national or regional background (Castillo, Conoley & Brossart, 2004), regionalism (Aoki, 2010), and variability across time, generations, and even the contexts in which the values are enacted (Arbona, Flores & Novy, 1995; Niemann, Romero & Arbona, 2000). The assumption included was that Hispanic culture shares a common set of beliefs.

A focus on patterns specific to Mexican-Americans was pursued based on the region of the United States in which the survey was conducted. The seven-state region was, starting in the west and moving east, New Mexico, Colorado, Kansas, Oklahoma, Texas, Louisiana, and Arkansas. Much of this region of the country was, at one time, part of Mexico (Ionita, n.d.). As this is the case, the predominant form of Hispanic culture across the region is Mexican-American although there are also representatives of other groups, Cubans, Puerto Ricans, Hondurans, etc., in the region, most noticeably in the urban areas like Albuquerque, Dallas, Denver, Houston, Kansas City, and Oklahoma City. All the topics addressed in the thirteen-part question were derived from themes that arose in the qualitative portion of the investigation. They were verified as worthy of inclusion with sources in the literature and through interaction with Hispanic/Latino employees of West Texas A&M University.

The question stem for the assessment of faculty, staff, and administrator understanding of Hispanic culture, specifically Mexican-American culture, was “Hispanic culture includes...” Brief statements or descriptions for each of the nine cultural elements, the idea that diversity exists in the broad concept of Hispanic culture, and the general assumption that Hispanic values include a common set of beliefs were listed following the stem. These statements were generated by the project team based on qualitative data, sources in the literature, and personal experience. Informants were asked to use a standard five-point Likert scale running from Strongly Disagree to Strongly Agree to note their level of agreement with each statement. The statements were as follows.

1. ...emphasize hard work.
2. ...are diverse.
3. ...include confidence in one's ability to succeed.
4. ...include accepting uncertainty in life.
5. ...include taking each day as it comes.
6. ...hold that events are predetermined.
7. ...esteem patience and politeness.
8. ...prioritize strong family relationships.
9. ...reinforce deferring to authority.
10. ...prioritize earning income over college.
11. ...reinforce gender norms in family roles.
12. ...hold a common set of beliefs.

In every case, Hispanic faculty, staff, and administrators were more likely to agree with the statements than their non-Hispanic peers. In ten of those instances, the differences were statistically significant. Nine with small effect and one, emphasis on hard work, with moderate effect. This is an important finding as it suggests there is a substantial difference along ethnic lines in perspective of what are elements of Hispanic culture among faculty, staff, and administrators at the Hispanic-Serving Institutions in the sample. Even when the cultural value listed is commonly understood to be a life style pattern for Hispanics, like prioritizing strong family relationships, Hispanics were more likely to agree at highly significant levels. The ratings provided by the Hispanic respondents also could be interpreted as confirming a set of cultural values as Hispanic adults working in higher education at all levels, in varying roles, and in three states agreed with them.

Understanding of the Background and Characteristics of Hispanic Students by Employees at HSIs

In addition to considering known cultural values, the research team also wished to understand the perspective faculty, staff, and administrators at HSIs had of their Hispanic students. Two questions were asked regarding the background and characteristics of Hispanic students. The first had the stem “Hispanic students have...” and the second had the stem “Hispanic students are...”. The descriptive statements for each question were developed based on the qualitative data gathered in the first phase of the project and literature review conducted when writing the proposal and planning the question sets for focus groups and interviews. The distinctive element of the material gathered in this part of the study is its focus on the perspective of faculty, staff, and administrators regarding these ideas rather than an investigation of the influence of one or more on outcomes for students. That is, a focus on what is understood about the students rather than what impacts their behavior or academic results. Some of the statements on the FSA survey made reference to STEM as the study was funded by the National Science Foundation and had, among its other goals, understanding challenges and opportunities in STEM education at HSIs (NSF, 2017). The “Hispanic students have...” statements follow.

1. ...parents who influence their decisions.
2. ...families who demand time/resources.
3. ...difficulty with college culture.
4. ...language barriers hindering academic success.
5. ...limited personal history with STEM professionals.
6. ...preferences for majors leading to local employment.

For the six “have” statements, there was one marginally significant finding and five significant to strongly significant findings by ethnicity. Effect sizes ranged from small to moderate, three small, two moderately small, and one moderate. Hispanics were, like with the descriptions of Hispanic cultural orientation, more likely to agree with these statements in every instance. Like above, several of the less pronounced differences were for statements of commonly held beliefs, like parents who influence their decisions and families who demand time/resources, yet the Hispanic respondents were still more likely to state these patterns existed for Hispanic students. A similar pattern was found in respect to the “Hispanic students are...” questions.

1. ...under-prepared for college math
2. ...under-prepared to navigate college processes.
3. ...primarily first generation students.
4. ...from low SES backgrounds.
5. ...working to attend college.
6. ...routinely involved with family members.
7. ...unlikely to seek help.
8. ...under-represented in upper-level STEM classes.
9. ...unaware of STEM opportunities.
10. ...intimidated by STEM.
11. ...not identifying with STEM.
12. ...going to college in or near their home towns.
13. ...arriving with inaccurate information about college.

For this list of 13 characteristics, all the comparisons along ethnic lines were strongly to highly statistically significant with effect sizes ranging from small to moderate. There were more moderately small and moderate findings than for the preceding sets of comparisons. Half the comparisons had moderate effect sizes while two others had moderately small effect sizes. Again, in every case Hispanic faculty, staff, and administrators were more likely to see these statements as accurate descriptions of Hispanic students.

Faculty, staff, and administrators at the HSIs were also asked about barriers to participation in student organizations and extra-curricular activities for Hispanic students studying in STEM fields. This was a five-part question with three statements related to practical concerns, living off campus, heavy course loads and work commitments, and two others relevant to the present consideration, family commitments and language barriers. Of the two, language barriers were seen by the Hispanic respondents as a possible explanation at significantly higher levels than by non-Hispanics. This occurred with a small effect size, indicating a less pronounced difference of opinion, as might have been expected given the changes in language usage in the American Hispanic population over the last decade reported by Flores (2017).

There is a consistent and strong difference of opinion between Hispanic faculty, staff, and administrators at the HSIs in the sample and their non-Hispanic counterparts regarding information available about Hispanic culture, the elements of Hispanic culture, and the characteristics and background of Hispanic students. It appears, based on this information, that the non-Hispanic employees at HSIs are less well informed about a major portion of their student population than would be desirable. Haupt and Connolly Knox (2018), when writing about why students should be trained for cultural competence noted forestalling the inclination “to negatively apply biases, stereotypes, and pre-conceived notions” (p. 538). While there is no evidence in the data gathered that the non-Hispanic faculty, staff, and administrators are operating in this manner, having them be better informed about Hispanic culture would make them “more credible, empathetic, relatable, and trustworthy” (Haupt & Connolly Knox, 2018, p. 538) when working with their Hispanic students than they currently might be.

Support for Hispanic Students

A great many questions were asked on the FSA survey about institutional processes, practices, facilities, and programming. Only a limited number of those topics will be discussed here. Each is relevant to developing a conception of the level of cultural understanding of and accommodation regarding Hispanic culture taking place at the HSIs in the sample. Consideration of a broad range of additional information about HSIs can be found in Preuss et al 2019b including staffing, their facilities, practices, and programming, information about how they evaluate some practices, and grant-funded endeavors in which they engage.

Use of Research or Institutional Data, Holistic Approach, and Emphasis on Hispanic Contributions

Survey takers were asked a three-part question with the stem “In respect to student support...” The two statements completing this statement that are applicable to the present discussion were “...based on published research or strong institutional data” and “...a holistic approach (academic, psychological, social, and cultural needs).” Informants were asked to respond using a five-point Likert scale, strongly disagree (SD), disagree (D), neither agree or disagree (NAD), agree (A), and strongly agree (SA). Very few parties disagreed with the statements and the majority selected neither agree or disagree. Approximately 31% of respondents indicated that student support programming at their institution was based on published research or strong institutional data while just over 36% felt these services took an approach that included consideration of the psychological, social and cultural background of the student. No significant differences were found between the responses from Hispanic and non-Hispanic employees of the institutions represented, although there was a significant difference ($p = .038$) with a small effect size between CCs and four-year institutions for use of research or institutional data with the same occurring for taking a holistic approach ($p = .004$). Respondents from the 2YR schools were more likely to agree (Table 10).

A separate question also addressed implementation of a holistic approach in service provided to students. It had the stem “Regarding practices, programs, and services at my institution....” Survey takers were asked to report on the presence of 26 distinct forms of engagement with students. Responses were submitted as yes, no, or I don’t know for each form of engagement. Responses were requested in respect to the respondent’s department and the STEM departments at their institution. In addition to asking about a holistic approach to student service, this list included one other topic relevant to the current discussion, “emphasis within courses on Hispanic contributions.” The STEM department totals were limited to persons who had identified themselves as working in a STEM department as analysis for dozens of questions in the FSA data set revealed that persons outside STEM departments were most likely to respond that they did not know what was being offered in STEM. Focusing on STEM department employees eliminated this uncertainty.

There were consistent and significant differences between the reports from community college personnel and those from employees of four-year institutions in respect to use of research and institutional data in student services, for taking a holistic approach to student support in general and at the department level, and for departments emphasizing the contributions of Hispanics in areas of study. The sole exception was emphasis of Hispanic contributions by STEM departments which was reported by less than 7% of all respondents. In each comparison, the community college personnel were more likely to report the description applied to practice on their campus than their peers at four-year institutions.

Low Student to Teacher Ratio

A final topic of interest regarding support for Hispanic students is student to teacher ratio. This is a pattern monitored by institutions of higher education and that is often reported in fact books and in online descriptions of colleges and universities. It is also applicable to the topic at hand as Hispanic culture is “traditionally collectivistic” (Ojeda, Edwards, Hardin & Pina-Watson, 2014, p. 66) and “emphasizes interdependence and relationships” (p. 66). Having this orientation would, logically, make a low student to teacher ratio desirable as personal interaction and formation of a relationship is more plausible. For this reason, several questions were included in the 2018 FSA survey in this topic area. Responses from staff are not included below as the decision makers in this area are faculty and administrators, faculty in course planning and implementation and administrators in respect to courses offered and desired class size.

1. A low student to teacher ratio is important...for facilitating faculty/student rapport (faculty – 92.0%, administrators – 92.5%).
2. ...in STEM instructions (faculty – 84.6%, administrators – 85.7%).
3. ...for Hispanic students (faculty – 67.1%, administrators – 81.6%).
4. ...for first-generation students (faculty – 77.9%, administrators – 89.8%).
5. ...for students from low SES background (faculty – 69.8%, administrators – 89.6%).
6. ...for female STEM students (faculty – 59.7%, administrators – 77.6%).

While there was general agreement that low student to teacher ratios are important for rapport, faculty responded less frequently that this was valuable for Hispanic students than in general, in STEM, for first-generation

students, and for students from low socio-economic backgrounds. The only group about which faculty were less certain there would be a benefit were female STEM students, which seems at odds with the high rating for STEM instruction. While the ordering of descriptions rated most favorably by administrators differed from that of faculty, they also were less positive that Hispanic students would benefit placing them at the same point as faculty, fourth out of five groups, in a highest agreement to lowest agreement rating.

Summary of FSA Survey Findings

In the 403 responses from faculty, staff, and administrators at HSIs in Colorado, New Mexico, and Texas, there are two key divisions in respect to constructs related to Hispanic culture. The first is a difference of opinion along ethnic lines. Hispanic respondents were less likely to agree that there was applicable information about Hispanic culture available to higher education professionals and more likely to agree with the statements made in the survey in respect to Hispanic culture and the background and characteristics of their Hispanic students than their non-Hispanic peers. While this is the first information of its kind, to the best of the authors' knowledge, that it was derived from responses from hundreds of informants at dozens of colleges and universities in a three state region should give the reader pause. Such a broad and consistent difference of opinion between Hispanic and non-Hispanic employees at HSIs points to, at a minimum, a notable difference in conception. This is a concern as student success theory and programming has for decades (Terenzini & Pascarella, 1991; Tinto, 1993) emphasized cultural support and limiting "acculturative stress" (Chun, Marin, Schwartz, Pham & Castro-Olivo, 2016, p. 385) for minority students.

As regards student support programming in patterns and areas relevant to Hispanic culture, being empirically-based, taking a holistic approach, and emphasizing Hispanic contributions to academic disciplines, there were regular differences by institution type. Personnel at the HSIs that were community colleges reported these characteristics at their institution more than their peers at four-year schools at statistically significant levels in five of six comparisons and with small to moderate effect sizes. While low student to teacher ratios were generally thought of as helpful, faculty and administrators were less certain this was beneficial for Hispanic students than for students in general, students in STEM courses, first-generation students, and students from low socio-economic backgrounds.

Related Findings from Surveys of Students

Since the work reported above was a first-of-its-kind investigation and the survey questions were generated by the research team, having a means of verifying the results was desirable. This is possible, to certain extent, using the responses gathered from students at 14 HSIs in New Mexico and Texas in 2018 and, in a separate effort, at three HSIs in north Texas in 2019. While the students were not asked the same questions as the faculty, staff, and administrators, they were asked about their background, experiences, and opinions. In many cases, the students provided insights about themselves that align with the information sought from the faculty, staff, and administrators. In the material that follows, responses from Hispanic students on the 2018 and 2019 surveys will be referenced. Level of agreement or median and mode scores will be reported, as applicable. While these will be an imprecise means of verifying the response patterns on the FSA survey, they represent responses from a separate Hispanic population operating in the same setting. They are also direct reports of opinion and experience from the students about whom the faculty, staff, and administrators were asked to comment. Median and mode is reported as doing so gives a clearer indication of central tendency than reporting a mean score.

Questions from two empirically-validated instruments were included in the 2019 survey. The entire Pearlin Mastery Scale (Pearlin, Lieberman, Menaghan & Millan, 1981) a locus of control instrument that continues to be used in research (Adams, Figley & Boscarino, 2008; Eklund, Erlandsson, & Hagell, 2012) and the entire set of Latino Familism Scale questions developed by Steidel and Contreras (2003). Both question sets were used with permission. Responses to questions from each will be considered in the material that follows but full consideration of the findings for familism and locus of control among Hispanic students attending HSIs will be presented in subsequent publications.

The first area in which there is substantial overlap between the FSA and student surveys is Hispanic culture. Students provided information relevant to many elements of Hispanic culture although they were not asked about diversity in Hispanic culture, taking each day as it comes, having gender norms reinforced, or there being a common set of values.

Student Responses Related to Hard Work and Confidence in One's Ability to Succeed

The FSA results included two highly significant findings for these topics. Hard work as a Hispanic cultural value had a moderate effect size for the difference found in responses along ethnic lines. Confidence in one's ability to succeed had a moderately small effect size. Students were not asked questions that were direct equivalents of queries on the FSA survey. There were, though, questions about their level of personal confidence and confidence that people in categories in which Hispanic students often appear could be as successful. Two of the questions about personal confidence that appeared on the 2019 survey were from the Pearlin Mastery Scale (Pearlin, Lieberman, Menaghan & Millan, 1981). The first is "I can do anything when I put my mind to it" that is paired in Table 12 with "I feel confident I can achieve my goals in college" that was generated by the project team and used in the 2018 survey. The second is "What happens to me in the future mostly depends on me" which is paired with the research team's 2018 question "I am in control of my own success."

While the student responses were to a different set of questions than asked of the faculty, staff, and administrators, they do address the same concepts, hard work and personal confidence. The inclusion of the last two statements about potential for success by first-generation and low-income college students was deemed appropriate as Hispanic students often fit in these categories (Bailey, Jenkins & Leinbach, 2005; Castillo, Conoley, & Brossart, 2004; Dennis, Phinney, & Chuateco, 2005; Olive, 2008). On both surveys, the Hispanic students were confident in their ability to succeed and in the ability of Latinos, first-generation students, and low-income students to be as successful as anyone else (2019 - median of 10 and mode of 10 for all three). It appears that the Hispanic students exhibit two characteristics the Hispanic faculty, staff, and administrators felt they would have, the efficacy of hard work and being confident in their own ability to succeed.

Student Responses Related to Uncertainty in Life and Events Being Predetermined

One statement generated by the project team to express concepts discussed by informants in the qualitative portion of the investigation and three statements from the Pearlin Mastery Scale (Pearlin, Lieberman, Menaghan & Millan, 1981) address uncertainty and predetermined events, a fatalistic outlook (Scott, 2001). This concept was included based on comments made in interviews and focus groups and because collectivist cultures, like the various Hispanic cultures (Ruiz, 2005), also exhibit fatalism (Diaz, Blanco, Bajo & Stavradi, 2015; Unger et al, 2002).

The FSA results for differences regarding these ideas by ethnic identity had a significant finding for uncertainty but not for predetermined events. Both comparisons had small effects. The student responses appear to mimic this pattern. Over two-thirds of the students from 14 HSIs agreed there are obstacles in their lives that are outside their control on the 2018 survey. Yet, responses to the Pearlin Scale questions in 2019 show most of the Hispanic students had a mild and middle-of-the-road response to being pushed "here and there" by circumstances, having "little control over things that happen," and feeling "helpless when dealing with problems." The responses for these statements were not widely distributed as the median and modes were the same values.

Student Responses Related to Esteeming Patience and Politeness (Simpatia)

Two statements from the Latino Familism Scale (Steidel & Contreras, 2003) are the only near equivalents to the statement used on the FSA survey, "Hispanic culture values...esteem patience and politeness," which was generated to represent the concept *sympatia* (Triandis, Marin, Betancourt, Lisansky & Chang, 1982), expecting "more positive behaviors in positive social situations and de-emphasiz[ing] the appropriateness of negative behaviors in situations of conflict" (p. 4). Yet, they demonstrate the elements noted by Triandis, Marrin, Betancourt, Lisansky and Chang and Ramirez-Esparza, Gosling, and Penebaker, "*Simpatia* is a cultural script that characterizes Hispanics as agreeable, friendly, sympathetic, and polite" (2008, p. 703).

The Hispanic FSA respondents felt strongly about this characteristic as indicated by the high mean rank (Table 4) and the strength of the difference in their response when compared to non-Hispanics. The students also had strong agreement, although for applications of the principle in a family setting. This can be seen as yet another point at which the FSA results from Hispanic faculty, staff, and administrators parallel the self-report from the Hispanic students surveyed.

Student Responses Related to Prioritizing Strong Family Relationships

The presence of a validated familism scale for Latinos (Steidel & Contreras, 2003) and the degree to which this concept is discussed in the literature demonstrate that this is an accepted element of Hispanic culture. While there was only one statement about this cultural value in the “Hispanic culture includes...” set, there were two questions on the 2018 student survey that corresponded and five from Steidel and Contreras’ (2003) Latino Familism Scale used on the 2019 student survey that were relevant.

Even though this is a value widely understood to be held by Hispanics, the Hispanic informants on the FSA survey were still more likely to affirm it than their non-Hispanic peers at statistically significant levels with a small effect. The student responses also affirm it, although the students appear more ambivalent about how much sacrifice should be expected to support members of their extended families who are in need. Over 85% of the Hispanic student respondents in 2018 said they felt strongly attached to their families and the relational prompts from the Latino Familism Scale have high medians and modes, with the exception of sacrificing for members of the extended family, as has already been noted. The students continue to affirm the views of their older ethnic compatriots.

Student Responses Related to Deferring to Authority

Respect for authority, in families (Galanti, 2003), relationships (Ramirez-Esparza, Gosling, and Pennebaker, 2008), and society (Ruiz, 2005), as a part of Hispanic culture is well documented and has been for decades (Matos, 2015; Triandis, Marin, Betancourt, Lisansky & Chang, 1982) and is represented in the Latino Familism Scale developed in 2003. Response patterns for three questions from the familism instrument that were part of the 2019 student survey addressed Hispanic student orientation to authority.

The 2018 survey for students did not include a question applicable to this area. The three included as part of the familism section in 2019 suggest that the students accept concepts related to parental authority and the positional/relational authority conferred by advanced years and extended life experience. While these are several forms of respect for authority, they do not comprise the entirety of the concept. Yet, at least in these areas, the responses of Hispanic students at the HSIs in the 2019 sample demonstrate that their views agree with the perspective of the Hispanic faculty, staff, and administrators communicated on the FSA survey regarding respect for authority as an element of Hispanic culture.

Student Responses Related to Prioritizing Immediate Income Over College

Matos (2015) confronted the perception that Hispanic parents are “uninterested in education” (p. 436). He found “Participants in the study identified how they use the cultural capital transmitted to them by their families and communities, and how they create ‘finishing,’ a new form of capital” (p. 436). This does not align with the notion that Hispanic parents favor income generating activity to college attendance for their early adult age children. The FSA consideration of Hispanic culture directly addressed this concept with the statement “Hispanic cultural values...prioritize earning income over attending college.” There was a group of six related statements on the student surveys. The Hispanic respondents on the FSA survey felt this characteristic described Hispanics to a greater extent than their non-Hispanic peers did with a small effect size. For a commonly held belief (Matos, 2015), the presence of a difference and affirmation of the statement by Hispanics is notable.

The student responses exhibit some duality. In 2018, they noted that college was important in Hispanic culture but considered college a luxury at almost exactly the same rate. The 2019 data confirms that college is considered a luxury. Students also indicated, at high levels, that their families supported their pursuit of education, valued a college degree, and saw college as important to the student’s future. Yet, over 40% said that they were expected to contribute financially at home. It appears that at this point, the surveys touch on a circumstance involving confluence of values. The value of higher education is recognized and the familial orientation includes support of someone pursuing that important goal (Rodin, 2018) yet the sense that college is in some way a “special opportunity” or “luxury” also seems to be present. Aoki (2010), Arbona, Flores and Novy (1995), and Castillo, Conoley and Brossart (2004) all discuss the potential for confluence of and even conflict between values held by Hispanics as they navigate life in general and higher education. That may be what is occurring for the Hispanic college students, several values are currently in conflict which may result, as the authors just cited note, in compromise, suppression of one value, or even the development of a new value.

Student Responses Related to Parental Influence and Family Demands

Parents of Hispanic college students are believed by many to exert influence over decisions the students make about commitments and allocation of resources. Arbona, Flores and Novy (1995), Dennis, Phinney and Chuateco, 2005, Castillo, Conoley and Brossart (2004), and Matos (2015) all discuss this topic. This idea was included in the 2018 FSA survey in response to information from the literature and comments made by interviewees and in focus groups. It was included in the “Hispanic students have...” question but divided into one statement about influence over decision making and another about use of time and resources. The Hispanic FSA informants agreed with these statements, at significant levels with small effect, more than their non-Hispanic peers. Two lines of evidence from Hispanic students are available, responses to five questions the research team generated and included in the 2018 student survey and responses to three questions from Steidel and Contreras’ (2003) Latino Familism Scale used on the 2019 survey. The direct focus of all of the questions asked of students was time and resource allocation, although the notion of family expectations and prioritization of needs and concerns introduces the notion of influence over decision-making.

The student responses demonstrate a general expectation that they would provide practical assistance to their family of origin. This conclusion is supported by nearly 60% indicating in 2018 that their family expects them to “have time to help at home when I am attending school” and the high median and modes posted for the three familism queries in 2019. Beyond time invested and practical supports, financial assistance is also a reasonably strong theme. Almost 41% of the 2018 respondents said they were expected to contribute financially to their family of origin and the one familism query that notes commitment of finances as a possible means of “help for elderly parents in times of need” had a median of 10 and a mode of 10. While the outworking of this value will be nuanced and might vary from family to family and circumstance to circumstance, as evidenced by several of the questions on the 2018 survey which asked about prioritization, the general orientation of the Hispanic students surveyed appears to match the understanding of Hispanic cultural values expressed by the Hispanic faculty, staff, and administrators.

The questions asked in 2018 about patterns of prioritization are also suggestive. While not proven to be valid and reliable, they elicited an intriguing set of responses. Nearly 48% of the Hispanic students from 14 HSIs said they believed “family needs take precedence over college.” While the related questions about family expectations in this area had 27.2% and 26.0% agreement, they show over one-quarter of the Hispanic students had families who positioned family concerns and activities ahead of college commitments on a priority scale. This has the strong potential to place college students from those families in situations in which two primary and valued life commitments are in conflict.

It was possible that the prioritization responses were influenced by the age of the respondents. If the Hispanic students in the pool were older, more were married or in long-term relationships, and/or carrying for children, the results might have been skewed. The percentage of respondents who fit each of these categories was compared to the non-Hispanic student pool. In each case, the percentages were nearly identical indicating that that the Hispanic student pool was not skewed toward older students, students with households of their own, or who were carrying for children. It appears, perhaps not as strongly as for other constructs, that the student testimony about their experience continues to align with the perspective of the Hispanic faculty, staff, and administrators.

Student Responses Related to Difficulty with Higher Education Culture

Acculturative stress (Castellanos & Gloria, 2017; Ramos-Sanchez & Atkinson, 2011) from difficulty in adjusting to or within the culture of higher education is a common theme in discussions of minority student success. It is also regularly addressed as it applies to Hispanic students. Examples cited in this paper are Arbona, Flores and Novy (1995), Luzzo (1997), Castillo, Conoley and Brossart (2004), Bailey, Jenkins, and Leinbach (2005), Dennis, Phinney and Chuateco (2005), Matos (2015), and Chun, Marin, Schwartz, Pham, and Castro-Olivo (2016). This concept was addressed directly by one statement on the FSA survey, “Hispanic students have...difficulty with college culture,” and in a related way by seven queries on the student surveys in 2018 and 2019. This topic area was one in which the Hispanic respondents on the FSA survey differed most with their non-Hispanic colleagues as the effect size was moderate, $r = .36$ (Table 5).

While the majority of Hispanic students on the 2018 survey noted that college had been a primarily positive experience nearly one-quarter also said that Hispanics feel like outsiders in college and nearly half

acknowledged changing their behavior when interacting with faculty and staff. Approximately 30% also acknowledged changing their behavior in class and when interacting with peers from outside their culture. While the responses do not include information about what these changes are or what precipitated the sense that a change should be made, it is possible that some of the changes in view relate to personal patterns rather than cultural patterns as just over 10% also noted they change their behavior with peers who are from their culture. The responses from non-Hispanic students support this supposition.

The 2018 Hispanic student response rates for change in behavior noted by Hispanic students were very similar to those for non-Hispanics, for fitting in in class (H 30.0%, NH 27.9%), with college peers from outside my culture (H 28.2%, NH 22.7%), and with college peers from my culture (H 10.3%, NH 12.7%). No significant differences were found by comparing responses from the two groups in these areas. There was, however, a significant difference with a small effect size between responses from Hispanic students and non-Hispanic students for behavior change when interacting with faculty and staff, 48.4% of Hispanic student respondents agreed while 33.1% of non-Hispanic students did ($p = .001$, $\phi = .155$).

The median and mode scores from 2019 are similar to the 2018 finding for interacting with faculty and staff as the most common rating was five on a ten-point scale with a median slightly above the mid-point. There was marked variation in responses for changing behavior in class and with college peers from outside one's culture. Both had mid-points of five on a ten-point scale but zero for their mode. These ratings also appears to align with the 2018 values but demonstrate that there may be gradation in the perception of need to alter or enacting alteration of one's behavior. Comparison of the Hispanic and non-Hispanic responses in 2019 regarding changing behavior when interacting with faculty and staff approached significance ($p = .055$). The primary difference in the distribution of responses was far more non-Hispanic students provided low ratings, twice as many submitting ratings of zero and two and one-third more submitting ratings of one and three.

A finding reported separately in Preuss et al (2019a) also is applicable here. On the 2019 survey, students were asked to indicate whether persons providing seven forms of service at the institutions exhibited cultural understanding in respect to "my culture." Ratings were requested for each on a ten-point scale. In every form of engagement with students listed on the survey, including instruction, Hispanic students were significantly more likely to say the institution's employees did not understand their culture with moderately small effect sizes for each comparison.

That this consistent and broad pattern occurred demonstrates extended breadth of culturally related difficulties for Hispanic students within the HSIs represented in the sample. All Hispanic students may not feel like outsiders in higher education but they do feel, at least for the 2019 sample, that their culture is not understood by the representatives of the institution. This is a significant concern given the emphasis on cultural congruity and limiting acculturative stress (Castellanos & Gloria, 2017; Chun, Marin, Schwartz, Pham & Castro-Olivo, 2016) in student support theories that focus on serving Hispanic students.

Student Responses Related to Being Under-Prepared for College Processes and Being First-Gen Students

Patterns of experiential, practical, and academic under-preparation for Hispanic students were discussed by informants in the focus groups and interviews in the first phase of this investigation. The informants also discussed their perceptions of the impact of first-generation college student standing on Hispanic students. Addressing the needs of students who are underprepared for college has been an emphasis of the Lumina Foundation for decades and has resulted in an area of specialization in higher education, developmental education. Barbatis (2010), Greene, Marti and McClenney (2008), and Nora and Crisp (2012) all discuss college preparation patterns specific to Hispanic students. In many cases, these discussions extend to limitations in social and cultural capital exhibited by first-generation students. Dennis, Phinney and Chuateco (2005) and Olive (2008) are examples of scholars who have written about the prevalence of this characteristic among Hispanics and the impact of first-generation student status.

The research team included students' ability to navigate college processes and being first-generation students in the FSA survey based on the qualitative portion of the study and the literature demonstrating that these are active and on-going concerns in higher education. The questions about college processes and first-generation student standing were part of the "Hispanic students are..." question set on the FSA instrument. A question was asked about academic preparation for college mathematics but there was no equivalent to it on the student

surveys. There was, though, a total of 14 questions from the 2018 and 2019 student surveys related to student preparation to navigate college processes and being a first-generation college student.

Hispanic faculty, staff, and administrators felt more strongly and at a significantly different level than their non-Hispanic colleagues that the Hispanic students at their HSIs were “primarily first generation students.” This was the case with a weak effect size even though there is the general notion that Hispanic students tend to be the first in their families to attend or complete college and published research exists in this topic area as has just been noted above. On the 2019 survey, students were asked to place themselves in one of five categories. Three represent definitions of first-generation student standing used by different groups. The Higher Education Act of 1965 defines first-generation students as individuals “whose parents did not complete a baccalaureate degree” (US Department of Health, Education, and Welfare, 1965, para. 19) but does not address Associate degrees or persons with some college attendance. The Center for First-Generation Student Success notes this and other challenges with defining the phrase and discusses alternate definitions (CFGCC, 2017).

The research team sought to accommodate the most restrictive definitions of first-generation college students while also including an Associates degree as a completed college credential. The first of the descriptions offered to students was “I am the first person in my family to attend college,” the most restrictive definition. The two others were “One or more family members have attended college but I will be the first to finish a two-year degree” and “One or more family members have attended college but I will be the first to finish a four-year degree.” The remaining options were “One or more family members have graduated college and received their degree” and “I don't know the college attendance history of my family members.” The percentage of students stating that they were first-gen students listed in Table 21 combines the responses received for all three definitions of a first-generation student (first to attend – 37.8%, first with 2YR degree – 12.4%, first with 4YR degree – 15.6%). This information confirms the perspective of the Hispanic employees that the Hispanic students at their HSIs were “primarily first generation students.”

The social and cultural capital of Hispanic college students relevant to college and how these factors impact student success have been a point of interest in higher education (Crisp & Nora, 2010; Sandoval-Lucero, Maes, & Klingsmith, 2014; Wells, 2008; Zambrana, & Zoppi, 2002). Because of this and references made by informants in the qualitative portion of the study, a series of queries that sought to understand the knowledge base in the student's family of origin regarding college processes and patterns and the level of assistance the student received with a variety of tasks were included in the 2018 and 2019 student surveys. A group of six questions about knowledge of processes and patterns was developed by the project team as well as list of seven tasks students have to complete. On the 2018 survey, a three-point rating scale (yes, somewhat, no) was employed with five of the questions about the knowledge base in the family of origin. The exception was learning about applying for financial aid which was part of group of questions for which a five-point Likert scale was used. In 2019, a ten-point sliding scale was employed for all six prompts. In order to report the response patterns in as similar a manner as possible, the responses of “Yes” and “Somewhat” were combined in the 2018 percentages reported for the family knowledge subset in Table 21. The percentage of “Yes” response in each category are listed below.

- My parent(s)/family know how college processes work – 28.7%.
- My parent(s)/family know about financing college – 36.1%.
- My parent(s)/family know about degree programs – 20.7%.
- My parent(s)/family can help with course selection – 16.7%.
- My parent(s)/family know how much work college is – 40.7%.

The agreement level reported for learning about financial aid is a combination of the agree and strongly agree responses on the five-point scale.

The response levels for 2018 and 2019 were similar for all but one of the knowledge base queries. The exception was students having to learn about applying for financial on their own. The level of knowledge on the part of the family of origin for knowing how college processes work, about financing college, and about college degree programs had 60% or more agreement in 2018 and median scores of six, or more, and modes of 10 in 2019. These are comparable response patterns indicating a general agreement with these statements. This, however, seems out of line with over 65% of the 2019 respondents labeling themselves as first-generation students and may be related to the way the prompts were worded. The questions were intended to elicit responses about possession of specific, up-to-date, and applicable knowledge in these areas but the phrasing, which was concise to keep the survey as brief as possible, is open to other interpretations like have a general

exposure to these ideas. The survey results appear to indicate more knowledge on the part of families than was anticipated but the imprecise wording may have impacted the result.

These results align with the responses for parents and family knowing how much work college is. Students in both years indicated this was the case for most of their families at similar levels. Over 75% of the Hispanic students affirmed this in 2018 and the median score for 2019 response was 7.5 with a mode of 10. These positive patterns did not continue for the more specific statements about help with course selection and learning about applying for financial aid. Most of the Hispanic students in 2018 and 2019 noted that their families were not able to help with course selection. In fact, the mode for the 2019 survey was 0 while the median score was similar to the affirmation rate for 2018, a median of 3 and affirmation rate of 33%. It is either at this more detailed and specific point that general knowledge fails to be applicable or the more precise prompt elicited the response pattern sought.

The response patterns for the seven tasks students face and how helpful parents and family were in these areas, defined in the prompt as ability to give accurate advice, are reasonably similar for the two students surveys. Many families were helpful to the student respondents in completing the FAFSA application. This is a logical outcome as FAFSA data includes the family's tax information. That 35% of Hispanic students in 2018 and 45% in 2019 noted their parents were not able to give accurate advice in this area is, however, worth noting. The remainder of the seven prompts all had less than 50% agreement in 2018 and 2019. They can be arranged in a descending order that is roughly associated with the level of detailed and college-specific knowledge needed to assist the student. This pattern matches what would be expected from a group of students in which 65% were the first in their families to attend college and/or complete a degree.

Parental ability to provide accurate advice about addressing problems in college nearing 50% in the 2019 data is also a logical finding. Even though many of the parents appear to be unable to give accurate advice in a number of the areas listed, many of the problems students encounter in college relate to organization, institutional structures, and relationships. The primary patterns for solving these types of challenges are not unique to higher education. They are all based in gathering information about the situation and communicating with representatives of the institution. These are baseline problem-resolution strategies practiced in all fields. Even parents with no understanding of college structures and patterns could suggest seeking further information and communicating with representatives of the institution as solutions.

To summarize, the student responses align with and generally confirm the perspective held by the Hispanic faculty, staff, and administrators in the 2018 sample. While some of the responses from students appear to indicate more ability to be helpful and provide accurate advice than might be anticipated these were also areas in which the wording of the prompts is general and open to a number of interpretations. When the prompts are more specific, the Hispanic students were shown to receive low levels of helpful and accurate assistance from parents and family in tasks necessary at college with lower levels reported as the tasks become more college-specific requiring greater understanding of college processes and procedures.

Conclusion

The research described in this document is first-of-its-kind in seeking to understand what faculty, staff, and administrators at Hispanic-Serving Institutions know and believe about Hispanic culture and the Hispanic students they serve. The concepts included in the surveys were provided by student, faculty, staff, and administrative informants from HSIs. They were also, as often as possible, informed by the literature. The result is a description of the perspectives of the FSA groups at HSIs that can at many points be verified using data gathered from students at HSIs in the same region, with each of those schools represented in the FSA response group.

The approach taken was exploratory as there is very little information available about HSIs, their employees, and students. As a result, the data primarily has a descriptive purpose. It documents what existed rather than providing the ability to explain why these patterns existed. The samples were large and broad enough that they can be treated with confidence. As reported in Preuss et al (2019a), the number of respondents for both student surveys exceeds the level necessary for 95% confidence with a 5% margin of error. This is, therefore, an initial reporting of investigative results that can be considered representative of the situation at the institutions in the sample and on which other studies can be based.

In the 403 responses from faculty, staff, and administrators at HSIs in Colorado, New Mexico, and Texas, there are two key divisions in respect to constructs related to Hispanic culture. The first is that a difference of opinion exists along ethnic lines. Hispanic FSA respondents were less likely to agree that there was applicable information about Hispanic culture available to higher education professionals and more likely to agree with the statements made in the survey in respect to Hispanic culture and the background and characteristics of their Hispanic students than their non-Hispanic peers. Such a broad and consistent difference of opinion between Hispanic and non-Hispanic employees at HSIs points to, at a minimum, a notable difference in conception of Hispanic culture and understanding of Hispanic students. This is a concern as student success theory and programming has for decades (Terenzini & Pascarella, 1991; Tinto, 1993) emphasized cultural support and limiting “acculturative stress” (Chun, Marin, Schwartz, Pham & Castro-Olivo, 2016, p. 385) for minority students. The findings suggest that there is more conflict around Hispanic culture and the potential for more acculturative stress for Hispanic students at HSIs than might be anticipated. As noted by Sue et al (2007), Keller and Galgay (2010), and Storti (2007), even when people have the best of intentions, operating across cultures without clear and accurate perspectives can result in misunderstanding and insult. While the name Hispanic-Serving Institution seems to imply that these colleges and universities would be particularly attune to this potential, the evidence presented above indicates that is generally not the case.

As regards student support programming using recommended patterns and areas relevant to Hispanic culture, that is being empirically-based, taking a holistic approach, and emphasizing Hispanic contributions to academic disciplines, one-third or fewer of the FSA respondents reported these practices in use at their place of employment. There were also regular differences found between the responses from 2YR and 4YR institutions. Personnel at the HSIs that were community colleges reported these characteristics at their institution more than their peers at four-year schools at statistically significant levels, in five of six comparisons, with small to moderate effect sizes. While low student to teacher ratios were generally thought of as helpful, faculty and administrators were less certain this was beneficial for Hispanic students than for students in general, students in STEM courses, first-generation students, and students from low socio-economic backgrounds. These are evidence that, as stated by Kruse, Rakha, and Calderone (2018) “cultural competency efforts on campuses remain largely under theorized and diffuse” (p. 733).

When student responses from 213 Hispanic students on the 2018 survey and 307 on the 2019 survey were compared to those of the Hispanic faculty, staff, and administrators, substantial alignment was found. This process was undertaken because the research team knows of no other data set similar to the 2018 FSA data gathered. The only means of verifying the results would be to compare them to responses from the same or a demonstrably similar population in the same region. The only known data set with substantial overlap was the student responses gathered in the same region at the same time and again a year later by the research team. This information was gathered at many of the institutions represented in the FSA data set and from the very students about whom the faculty, staff, and administrators were commenting. The student responses can also be seen as viable means of verifying the culture values orientation expressed by Hispanic FSA informants as the students were a separate Hispanic population that operates in the same institutions of higher education, the same communities, and the same region of the country.

The FSA and Hispanic student data identified a set of cultural values accepted by the Hispanic population of the region. These can be used as the basis of institutional programming and professional development as well as research. The FSA responses and comparison to Hispanic student responses also confirmed elements of a profile of Hispanic students attending HSIs in the region. This may be limited to Texas and the adjacent states, but it is still broadly applicable information as there are over 120 HSIs in the seven-state region. The investigation also verified that HSIs in the region are not following much of the advice provided in the literature. Very few are distributing information about Hispanic culture and students, patterns of sharing “knowledge [and] professional learning” (p. 733) a practice advocated by Kruse, Rakha, and Calderone (2018) to advance cultural competence at colleges and universities. Very few are emphasizing contributions of Hispanics to academic fields, another practice suggested by Kruse, Rakha, and Calderone. Castellano and Gloria’s (2007) emphasis on cultural strengths and supports and the recommendation of multiple authors to limit acculturative stress (Chun, Marin, Schwartz, Pham & Castro-Olivo, 2016; Santiago, Taylor & Calderon, 2015) appear to, at best, have been ineffectively activated at the HSIs in the sample. The finding from Hispanic students on the 2019 survey that institutional representatives enacting seven key areas of engagement with students, including instruction, do not “understand my culture” seems to confirm this. The study results appear to be a call for change at HSIs in respect to increasing understanding of Hispanic culture, of Hispanic students, and how to best provide instruction, service, and support for them.

Recommendations

The survey data described above revealed strong and consistent differences of opinion between Hispanic faculty, staff, and administrators at the HSIs and their non-Hispanic peers regarding information available about Hispanic culture, the elements of Hispanic culture, and the characteristics and background of Hispanic students. It also demonstrated that a different audience in the same setting, Hispanic students at some of the HSIs, exhibited the background, beliefs, and traits the Hispanic faculty, staff, and administrators thought they would. The data showed that very few HSIs are actively educating their employees about Hispanic culture and the backgrounds, needs, and concerns of Hispanic students although, in that limited group, the community college personnel were more likely to report implementation of several practices relevant to Hispanics and Hispanic culture.

What is being done in these areas, appears to be incomplete or ineffective as the Hispanic students in the 2019 sample indicated that the HSI employees providing advising/mentoring, instruction/teaching, tutoring services, scholarship and financial aid assistance, career services, and who sponsor student organizations did not understand their culture. These circumstances illustrate a marked need for an increase of cultural competence on the part of many employees at the HSIs. This will not be effected or effective without “campus leadership [involved] in the development of supportive characteristics” (Kruse, Rakha & Calderone, 2018, p. 733). Increases in this area will make the HSIs and their employees “more credible, empathetic, relatable, and trustworthy” (Haupt & Connolly Knox, 2018, p. 538) in the eyes of students.

There are existing models to guide these efforts like those developed by Castellanos and Gloria (2007) and Santiago, Taylor, and Calderon (2015). There is also a great wealth of information about student success programming, advising, mentoring, instructional design, and other relevant topics available in the literature. To avoid extension of “under theorized and diffuse” (Kruse, Rakha & Calderone, 2018, p. 733) practice, the agenda suggested by Kruse, Rakha and Calderone, “attention to shared knowledge, professional learning at all levels of the organization, inclusive instructional methods, integration with other campus initiatives, and inclusivity of diversity foci” (p. 733), is an appropriate starting point for discussion and planning. The research results reported above can function as thought provoking and organizing material in a conversation of this type. While further investigation and elucidation in many areas is desirable, there is no time to delay.

As noted above, nearly two-thirds of the undergraduates in the US who identify as Hispanic attend HSIs (Revilla, 2018). With 2.3 million Hispanics attending college in 2014 (Krogstad, 2016), that represents more than 1.5 million students. As the largest segment of the US population after Whites (Flores, 2017), the second fastest growing segment of the US population, and the youngest of all the US’ ethnic groups, Hispanics will be a larger percentage of the college ready population in the coming decades. This is already the case in some parts of the country like Texas where 52.4% of the students in the public schools were Hispanic in the 2017-2018 school year (Nagy, Whallun & Kallus, 2018).

There are also many colleges and universities whose student population is predominantly Hispanic like Texas A&M International University, Saint Mary’s University, the University of the Incarnate Word, California State University San Bernadino and Stanislaus, and the University of New Mexico (TAMIU, 2015). With declining enrollment and declining birth rates in most segments of the US population (DeBarros & Adamy, 2019), young adults from Hispanic/Latino backgrounds are the only portion of the market for US colleges and universities that is notably expanding. It is both appropriate and necessary that the institutions a large percentage of them have chosen to attend would establish culturally appropriate supports, seek to limit “acculturative stress” (Chun, Marin, Schwartz, Pham & Castro-Olivo, 2016, p. 385) felt by the students, and work to develop “supportive characteristics” (Kruse, Rakha & Calderone, 2018, p. 733) to nurture a healthy and affirming environment for their Hispanic students.

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References

- Adams, R. E., Figley, C. R. & Boscarino, J. A. (2008). The compassion fatigue scale: its use with social workers following urban disaster. *Research on Social Work Practice, 18*(3), 238-250.
- Aoki, E. (2010). Mexican American ethnicity in Biola, CA: an ethnographic account of hard work, family, and religion. *Howard Journal of Communications, 11*(3), 207-227.
- Arbona, C., Flores, C. L. & Novy, D. M. (1995). Cultural awareness and ethnic loyalty: dimensions of cultural variability among Mexican American college students. *Journal of Counseling and Development, 73*(6), 610-614.
- Bailey, T., Jenkins, D. & Leinbach, T. (2005). What we know about community college low-income and minority student outcomes: descriptive statistics from national surveys. New York, NY: Community College Research Center.
- Barbatis, P. (2010). Underprepared, ethnically diverse community college students: factors contributing to persistence. *Journal of Developmental Education, 16*-26.
- Blankvoort, N., Kaelin, V., Poerbodipoero, S. & Guidetti, S. (2019). Higher education students' experiences of a short-term international programme: Exploring cultural competency and professional development. *Educational Research, 61*(3), 356-370.
- Bodycott, P., Mak, A. & Ramburuth, S. (2014). Utilising an internationalised curriculum to enhance students' intercultural interaction, engagement and adaptation. *The Asia-Pacific Education Researcher, 23*(3), 635-643.
- Bücker, J. & Korzilius, H. (2015). Developing cultural intelligence: assessing the effect of the Ecotonos cultural simulation game for international business students. *The International Journal of Human Resource Management, 26*(15), 1995-2014.
- Castillo, L.G., Conoley, C. W. & Brossart, D. F. (2004). Acculturation, White marginalization, and family support as predictors of perceived distress in Mexican American female college students. *Journal of Counseling Psychology, 51*(2), 151-157.
- Center for First-Generation Student Success. (November 20, 2017). Defining first-generation. Retrieved from <https://firstgen.naspa.org/blog/defining-first-generation>
- Chun, E. & Evans, A. (2016). *Rethinking cultural competence in higher education: an ecological framework for student development*. Hoboken, NJ: John Wiley & Sons.
- Chun, H., Marin, M. R., Schwartz, J. P., Pham, A. & Castro-Olivo, S. M. (2016). Psychosociocultural structural model of college success among Latina/o students in Hispanic-Serving Institutions. *Journal of Diversity in Higher Education, 9*(4), 385-400.
- Chun, M. (2010). Pitfalls to avoid when introducing a cultural competency training initiative. *Medical Education, 44*(6), 613-620.
- Crisp, G. & Nora, A. (2010). Hispanic student success: factors influencing the persistence and transfer decisions of Latino community college students enrolled in developmental education. *Research in Higher Education, 51*(2), 175-194.
- Cuellar, I., Arnold, B. & Gonzalez, G. (1995). Cognitive referents of acculturation: assessment of cultural constructs in Mexican Americans. *Journal of Community Psychology, 10*.
- Curry, P. & Luque-Ekrich, M. (1995). Beyond manana: other aspects of the concept of time in Hispanic societies as seen in celebrations and activities throughout the year. Paper presented at the Annual Meeting of the Central States Conference on Foreign Language Teaching (1995).
- DeBarros, A. & Adamy, J. (May 15, 2019). U.S. births in 2018 hit 32-year low. *The Wall Street Journal, A3*.
- Diaz, D., Blanco, A., Bajo, M. & Stavvaki, M. (2015). Fatalism and well-being across Hispanic cultures: the Social Fatalism Scales (SFS). *Social Indicators Research, 124*(3), 929-945.
- Dennis, J. M., Phinney, J. S. & Chuateco, L. I. (2005). The role of motivation, parental support, and peer support in the academic success of ethnic minority first-generation college students. *Journal of College Student Development, 46*(3), 223-236.
- Duda, J. L. (1985). Goals and achievement orientations of Anglo and Mexican-American adolescents in sport and the classroom. *International Journal of Intercultural Relations, 9*, 131-150.
- Eklund, M., Erlandsson, L-K. & Hagell, P. (2012). Psychometric properties of a Swedish version of the Pearlin Mastery Scale in people with mental illness and healthy people. *Nordic Journal of Psychiatry, 66*(6), 380-388.
- Field, A. (2013). *Discovering statistics using IBM SPSS statistics*. Thousand Oaks, CA: Sage Publications.
- Flores, A. (2017). How the U.S. Hispanic population is changing. Pew Research Center. Retrieved from <http://www.pewresearch.org/fact-tank/2017/09/18/how-the-u-s-hispanic-population-is-changing>
- Fragoso, J. M. & Kashubeck, S. (2000). Machismo, gender role conflict, and mental health in Mexican American men. *Psychology of Men & Masculinity, 1*(2), 87-97.

- Galanti, G. A. (2003). The Hispanic family and male-female relationships: an overview. *Journal of Transcultural Nursing, 13*(3), 180-185.
- Garcia, G. A. (2019). *Becoming Hispanic-Serving Institutions: opportunities for colleges and universities*. Baltimore, MD: Johns Hopkins University Press.
- García Ochoa, G. & McDonald, S. (2019). Destabilisation and cultural literacy. *Intercultural Education, 30*(4), 351-367.
- Greene, T. G., Marti, C. N. & McClenney, K. (2008). The effort—outcome gap: differences for African American and Hispanic community college students in student engagement and academic achievement. *The Journal of Higher Education, 79*(5), 513-539.
- Haupt, B. & Connolly Knox, C. (2018). Measuring cultural competence in emergency management and homeland security higher education programs. *Journal of Public Affairs Education, 24*(4), 538-556.
- Ionita, C. (n.d.). Historical maps of Mexico. Retrieved from <https://www.edmaps.com/html/mexico.html>
- Jeffreys, M., & Dogan, E. (2012). Evaluating the influence of cultural competence education on students' transcultural self-efficacy perceptions. *Journal of Transcultural Nursing, 23*(2), 188-197.
- Kedzior, K., Röhrs, W., Kühnen, U., Odag, O., Haber, F., & Boehnke, K. (2015). Evaluation of an intercultural peer training for incoming undergraduate students at an international university in Germany. *SAGE Open July-September 2009, 5*(3), 1-9.
- Keller, R. M. & Galgay, C. E. (2010). Microaggression experiences of people with disabilities. In Sue, D. W. *Microaggressions and marginality: manifestation, dynamics, and impact*. Hoboken, NJ: John Wiley & Sons.
- Knight, P. K., Gonzalez, N. A., Saenz, D. S., Bonds, D. D., German, M., Deardorff, J., Roosav, M. W. & Updegraff, K. A. (2010). The Mexican American Cultural Values Scale for adolescents and adults. *Journal of Early Adolescence, 33*(3), 444-481.
- Knight, P. K., Mazza, G. L. & Carlo, G. (2018). Trajectories of familism values and prosocial tendencies of Mexican American adolescents. *Developmental Psychology, 54*(2), 378-384.
- Kolb, S. M. (2012). Grounded theory and the constant comparative method: valid research strategies for educators. *Journal of Emerging Trends in Educational Research and Policy Studies, 3*(1), 83-86.
- Koskinen, L., Kelly, H., Bergknut, E., Lundberg, P., Muir, N., Olt, H., Richardson, E., Sairanen, R. & De Vlieger, L. (2012). European Higher Health Care Education Curriculum: development of a cultural framework. *Journal of Transcultural Nursing, 23*(3), 313-319.
- Krogstad, J. M. (July 28, 2016). FactTank: 5 facts about Latinos and education. Pew Research Center. Retrieved from <https://www.pewresearch.org/fact-tank/2016/07/28/5-facts-about-latinos-and-education/>
- Kruse, S., Rakha, S. & Calderone, S. (2018). Developing cultural competency in higher education: An agenda for practice. *Teaching in Higher Education, 23*(6), 733-750.
- Lorenzo-Blanco, E. I., Unger, J. B., Baezconde-Garbanati, L., Ritt-Olson, A. & Soto, D. (2012). Acculturation, enculturation, and symptoms of depression in Hispanic youth; the roles of gender, Hispanic cultural values, and family functioning. *Journal of Youth and Adolescence, 41*(10), 1350-1365.
- Luzzo, D. A. (1997). Correlates of Mexican American college students' perceptions of career related barriers. Paper presented at the Annual Meeting of the American Psychological Association (Chicago, IL, August 1997).
- Marrun, N. A. (2015). Gente estudiada: Latina/o students confronting and engaging home/community knowledge within/outside institutions of higher education. (Doctoral dissertation). Retrieved from ProQuest. (UMI Number: 3737898)
- Matos, J. (2015). La familia: the important ingredient for Latina/o college student engagement and persistence. *Equity & Excellence in Education, 48*(3), 436-453.
- Nagy, S., Whallun, C. & Kallus, R. (2018). *Enrollment in Texas public schools 2017-2018*. Austin, TX: Texas Education Agency.
- National Science Foundation. (2017). Award abstract # 1764268 – HSI conference: stakeholder perspectives on challenges and opportunities for improving undergraduate STEM education at HSIs. Retrieved from https://www.nsf.gov/awardsearch/showAward?AWD_ID=1764268
- Niemann, Y. F., Romero, A. & Arbona, C. (2000). Effects of cultural orientation on the perception of conflict between relationship and education goals for Mexican American college students. *Hispanic Journal of Behavioral Sciences, 22*(1), 46-63.
- Nittle, N. K. (2019). Which 4 states have the biggest minority populations? Retrieved from <https://www.thoughtco.com/states-with-majority-minority-populations-2834515>
- Nora & Crisp (2012). Hispanic student participation and success in developmental education. White paper prepared for the Hispanic Association of Colleges and Universities. San Antonio, TX: University of Texas at San Antonio.

- Office of the Law Revision Counsel of the U.S. House of Representatives. (n.d.). US Code 1101a. Definitions; eligibility. Retrieved from <https://www.law.cornell.edu/uscode/text/20/1101a>
- Ojeda, L., Edwards, L. M., Hardin, E. E. & Pina-Watson, B. (2014). The role of behavioral and cognitive cultural orientation on Mexican American college students' life satisfaction. *Journal of Hispanic Higher Education, 13*(1), 63-74.
- Olive, T. (2008). Desire for higher education in first-generation hispanic college students enrolled in an academic support program: a phenomenological analysis. *Journal of Phenomonological Psychology, 39*(1), 81-110.
- Pearlin, L. I., Lieberman, M. A., Menaghan, E. G., & Millan, J. T. (1981). The stress process. *Journal of Health and Social Behavior, 22*, 337-356.
- Pillay, S. & James, R. (2015). Examining intercultural competency through social exchange theory. *International Journal of Teaching and Learning in Higher Education, 27*(3), 320-329.
- Preuss, M., Sosa, E., Rodin, J., Ramos, J., Dorsett, C. & Burleson, C. (2019). Role models and mentoring relationships: preferences expressed by Hispanic students attending Hispanic-Serving Institutions. *2019 International Conference on Social and Education Sciences Proceedings*.
- Preuss, M. D., Rodin, J. C., Sosa, E. M., Ramos, J. D., Dorsett, C. R. & Burleson, C. R. (2019). Describing Hispanic-Serving Institutions in the south-central United States: a report for Los Barrios de Amarillo. Canyon, TX: West Texas Office of Evaluation and Research.
- Ramirez-Esparza, N., Gosling, S. D. & Pennebaker, J. W. (2008). Paradox lost: unraveling the puzzle of Simpatia. *Journal of Cross-Cultural Psychology, 39*(6), 703-715.
- Ramos-Sanchez, L. & Atkinson, D. R. (2011). The relationships between Mexican American acculturation, cultural values, gender, and help seeking intentions. *Journal of Counseling & Development, 87*(1), 62-71.
- Revilla, N. J. (May 31, 2018). Number of Hispanic-Serving Institutions in the U.S. increases to 492. Retrieved from <https://www.hacu.net/NewsBot.asp?MODE=VIEW&ID=2920>
- Rodin, J. (2018). Self-reported familial support and expectations amongst students at Hispanic-Serving Institutions. *2019 Texas A&M University System Pathways Conference*, Canyon, Texas.
- Ruiz, E. (2005). Hispanic culture and relational cultural theory. *Journal of Creativity in Mental Health, 1*(1), 33-55.
- Sandell, E. & Tupy, S. (2015). Where cultural competency begins: changes in undergraduate Students' intercultural competency. *International Journal of Teaching and Learning in Higher Education, 27*(3), 364-381.
- Sandoval-Lucero, E., Maes, J. B. & Klingsmith, L. (2014). African American and Latina(o) community college students' social capital and student success. *College Student Journal, 48*(3), 522+.
- Scott, A. (2001). The implications of fatalism. Retrieved from <http://www.angelfire.com/md2/timewarp/fatalism.html>
- Schwartz, A. J. (1971). A comparative study of values and achievement: Mexican-American and Anglo youth. *Sociology of Education, 44*(4), 438-462.
- Storti, C. (2007). *The art of crossing cultures* (2nd Edition). Boston, MA: Nicholas Brealey Publishing.
- Steidel, A. G. L. & Contreras, J. M. (2003). A new familism scale for use with Latino populations. *Hispanic Journal of Behavioral Sciences, 25*(3), 312-330.
- Sue, D. W., Capodilupo, C. M., Torino, G. C., Bucceri, J. M., Holder, A. M. B., Nadal, K. L. & Esquilin, M. (2007). Racial microaggressions in everyday life: implications for clinical practice. *American Psychologist, 62*(4), 271-286.
- Sund, A. C. (2014). Strangers in the academy: retention of Latino non-traditional college students and college culture. (Doctoral dissertation). Retrieved from ProQuest. (UMI Number: 3688477)
- Swanberg, S., Abuelroos, D., Dabaja, E., Jurva, S., Martin, K., McCarron, J., Reed-Hendon, C., Yeow, R. & Harriott, M. (2015). Partnership for diversity: a multidisciplinary approach to nurturing cultural competence at an emerging medical school. *Medical Reference Services Quarterly, 34*(4), 451-460.
- Terenzini, P. T. & Pascarella, E. T. (1991). Twenty years of research on college students: lessons for future research. *Research in Higher Education, 32*(1), 83-92.
- Texas A&M International University. (2015). TAMIU ranks No. 1 among nation's top 10 colleges with highest Hispanic enrollment. Retrieved from <https://www.tamui.edu/newsinfo/2015/07/2015-HispanicEnrollment.shtml>
- Tinto, V. (1993). *Leaving college: rethinking the causes and cures of student attrition*. Chicago: The University of Chicago Press.
- Triandis, H. C., Marin, G., Betancourt, H., Lisansky, J. & Chang, B-H. (1982). *Simpatia as a cultural script of the Hispanics*. Washington, DC: Office of Naval Research.

- Unger, J.B., Ritt-Olson, A., Teran, L., Huang, T., Hoffman, B. R. & Palmer, P. (2002). Cultural values and substance use in a multiethnic sample of California adolescents. *Addiction Research & Theory, 10*(3), 257-279.
- U.S. Department of Health, Education, and Welfare, Office of Education. (1965). *Higher education act of 1965 section-by-section analysis*. Washington, DC: U.S. Department of Health, Education, and Welfare, Office of Education.
- Valencia, H. (1989). Hispanic values and subcultural research. *Journal of the Academy of Marketing Science, 17*(1), 23-28.
- Wells, R. (2008). Social and cultural capital, race and ethnicity, and college student retention. *Journal of College Student Retention, 10*(2) 103-128.
- Zambrana, R. E. & Zoppi, I. M. (2002). Latina students: translating cultural wealth into social capital to improve academic success. *Journal of Ethnic & Cultural Diversity in Social Work, 11*(1-2), 33-53.

Transfer as Positive Attitudes towards Knowledge and Specific Behavior

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Abstract: This article draws on social psychology's research into attitudes and values to explain how transfer of writing knowledge may be facilitated through attitude formation and change. The theoretical writing knowledge as stated in Threshold Concepts of Writing explains that writing is a tool that mediates human interactions, enacting and evolving ideologies and identities within activity systems and discourse communities. Such an understanding, we hope, encourages students to see the context-specific nature of writing, and the specific ideologies and beliefs that exist within communities whom students are addressing as they write. I want to propose that if students are to transfer such theoretical writing knowledge across contexts, teachers must 1) define transfer of writing knowledge as beyond the general definition of repurposing of knowledge, to a more specific list of behaviors such as active reading, questioning, listening, and participation within a discourse community—behaviors which would facilitate understanding of specific writing genres, conventions, and community ideologies, beliefs, and interests; 2) understand that transfer is likely to happen when students have positive attitudes towards both theoretical knowledge and specific behaviors, given Fishbein and Ajzen's Theory of Planned Behavior, which suggests behavior is more likely when individuals believe in the positive consequences of the behavior, the subjective norms of such behavior, and also, in their self-efficacy in overcoming potential obstacles when engaging in the behavior; 3) encourage students to have positive attitudes by showing how theoretical knowledge and transfer behavior fulfill values. Invoking values (for example, by exemplifying how learning our knowledge and engaging in information-seeking and community participation may contribute to effective writing for one's families, cultures, and communities, thus fulfilling values of security and benevolence from Schwartz's model), may provide students motivation for elaboration and opportunities for self-affirmation, as we encourage positive attitudes and beliefs towards writing theory and transfer behavior.

Keywords: Transfer, Attitudes, Values, Student motivation

Introduction

In a specific time and place, writing addresses the needs of an audience—or of a community. The community can include disciplines of a university such as biochemistry or social psychology. The understanding that writing is an activity within communities are part of the threshold concepts of writing, which are the writing knowledge and theory undergoing consolidation in Writing Studies, or First-Year Composition, by scholars and teachers who emphasize that teaching writing knowledge, besides writing process, is crucial, if students are to successfully write in different disciplines of the university (Yancey, 2018; Robertson & Taczak, 2018; Downs & Robertson, 2015). Threshold concepts of writing, in part, explain that writing mediates human interactions, while creating and enacting ideologies and identities within activity systems (Scott, 2015; Adler-Kassner & Wardle, 2015). Such an understanding, we hope, encourages students to see that writing is context-specific and to make choices in their writing according to the conventions, knowledge, beliefs, and interests of different disciplines in the university.

I want to propose that if students are to transfer writing theory or threshold concepts of writing across contexts, teachers must 1) define transfer of writing knowledge as involving both cognition (such as making rhetorical choices) and specific behaviors, such as active reading, questioning, listening, and participation—behaviors that would facilitate understanding of specific writing conventions and genres, along with community ideologies, beliefs, and interests; 2) understand that transfer is likely to happen when students have positive attitudes towards both theoretical knowledge and specific behaviors, given Fishbein's and Ajzen's Theory of Planned Behavior, which suggests behavior is more likely when individuals believe in the positive consequences of the behavior, the subjective norms of such behavior, and also, in their self-efficacy in overcoming potential obstacles when engaging in the behavior; 3) encourage students to hold positive attitudes by showing students how theoretical knowledge and transfer behavior fulfill human values, or guiding principles, as discussed by Schwartz, Rokeach, Steele, and Maio. Ultimately, I will argue that articulating to students how writing theory and transfer behaviors fulfill human values may encourage students to hold positive attitudes towards writing theory and the behaviors necessary for effective writing across time and place.

Threshold Concepts of Writing as Specific Behaviors

Firstly, I believe it is important to define the theory of activity systems which undergird threshold concepts of writing, so that I may show that, if the goal is for students to learn and transfer writing theory, transfer should be defined as more than the repurposing of prior writing knowledge to new writing situations (Wardle, 2012), or the application of prior writing knowledge to new contexts (or cognitive moves writers make), as transfer is commonly defined, but, also defined as that which encompasses specific behaviors. Activity systems may be defined (perhaps in simplistic way) as a group of people who use tools, such as specific genres of writing, to express, reinforce, and evolve the shared motives, purposes, beliefs, and ideologies of the group (Russell, 1997). An activity system can encompass large, or even small, units, of people including (and not limited to), “a family, a religious organization, an advocacy group, a political movement” (Russell, 1997, pg. 5). Examples of writing genres include a family to-do list in the activity system of a family, and research studies and articles in scientific disciplines of the university. Wardle (2009) explains that activity systems are crucial to understanding why exercises in mechanics or grammar and the general “academic essay” taught in traditional first year composition classes are not enough: each discipline is an activity system of their own, and writing is different in every discipline to the extent that different communities, such as the discipline of biology and engineering, not only have different genres and conventions of writing, but diverging interests, purposes, and goals that shape their disciplines as well as their disciplinary writing practices. Writing conventions and content (including methods of research), ultimately, is defined by the community, and therefore Wardle (2009) argues that the hypothetical academic essay, which is often used in traditional freshman writing classrooms, cannot capture the unique ideologies, knowledge, and culture, which students must understand, or at least tacitly recognize, as they write in their disciplines.

Instead, writing scholars (Adler-Kassner & Robertson, 2015; Downs & Robertson, 2015), emphasize the importance of teaching writing knowledge as discussed in the threshold concepts of writing, which are influenced in large part by theories of activity systems, in order to help students recognize that writing needs to be adjusted according to the specific situation and the community one is addressing. Threshold concept 1 states that writers are connected to other human beings (as parts of existing culture or communities such as disciplines of the university) as writers address “the needs and interests” of a specific audience (Roozen, 2015, pg. 17). Threshold concept 2 (Bazerman, 2015) discusses the importance of genres as tools to address specific needs or situations. Threshold concept 3 (Scott, 2015) explains that writing creates and enacts identities and ideologies, and that writing shapes and is reinforced by the culture or the community the writer is addressing. Overall, these concepts express that writers craft their writing based on their knowledge of both the situation and the needs of an audience—and also a strong understanding of the beliefs and the culture with which the community identifies. This means writers must recognize that the audience and the self (as the writer) are parts of the fabric of a culture, community, or an activity system, with shared commonalities, such as shared beliefs, ideologies, and goals. Such a theory would help students understand that writing is not just about the act of writing, but about perceiving and recognizing distinctions of particular writing conventions, and, also, of the beliefs, ideologies, and purposes that shape different communities. Therefore, writing means simultaneously holding a mindset of actively engaging in continuous learning: in fact, threshold concept 4 examines how all writers, ranging from expert to novice, always have more to learn about writing (Rose, 2015), because there is always more to learn about the specific situation and the audience of different communities or activity systems. Such knowledge would help writers craft effective and appropriate language (Matsuda, 2015) based on disciplinary conventions, knowledge, and practices.

Because the threshold concepts of writing emphasizes making necessary writing adjustments based on knowledge of a discipline or community, I would suggest that applying threshold concepts of writing to different situations, or transferring writing theory, constitutes both adjusting and repurposing writing knowledge and, also, attempting to gain a complex understanding of an audience as groups of individuals who share identification with specific cultures, conventions, and beliefs. That is, transferring writing theory also means one must engage in knowledge-seeking behaviors that would help writers understand the culture, the ideologies, the identities, and the beliefs, as much as the writing conventions, of a community. Therefore, successful application of writing theory in different contexts may mean that students should, at the very least, find and read the available texts produced and circulated by a community, interact with community members by asking questions and listening, and participate in community gatherings or events, along with a number of other potential behaviors which would facilitate students’ deep understanding and appreciation of the particular culture of the audience or the community whom the writer is addressing.

Therefore, if teachers want students to be successful writers in diverse writing situations, teachers have to encourage students to learn writing theory and to apply such theory through specific behaviors, or what I will call “transfer behavior,” within the communities students will eventually join both inside and outside the university. I believe such encouragement can be facilitated through persuasion as it is understood in social psychology; after all, if transfer of threshold concepts of writing is the goal, then, as much as writing teachers should focus on students learning threshold concepts of writing, writing teachers should also consider persuading students to engage in specific behaviors that constitute the application, expression, and practice of such theories in different contexts. In the next section, I will discuss briefly what research in persuasion entails and why persuasion may be crucial for students accepting, holding onto, and transferring knowledge through specific behaviors.

Relevance of Attitude Formation and Change

The scientific research into persuasion is also known as the research into attitude formation and change. “Attitudes” in social psychology are discussed as either positive, negative, or ambivalent evaluations (or respectively, in very simplistic descriptions, “likes,” “dislikes,” or both “likes” and “dislikes”) an individual has towards an object, including abstract objects such as knowledge and beliefs (Maio, Haddock, & Verplanken, 2019). In social psychology, persuasion is a matter of how one forms attitudes (or how one forms a “like” or a “dislike”) in the first place, and how one might change his or her prior attitudes. I would suggest that attitude formation and change are central to encouraging transfer behavior, because attitudes contribute to human behavior in general. In other words, persuasion is a matter of not just encouraging someone to like or dislike an object, such as writing theory, but encouraging one to hold evaluations in order to promote the individual’s specific behaviors in relation to the object, such as encouraging positive attitudes towards threshold concepts of writing so that students apply the concepts outside of the composition classroom.

Furthermore, I believe attitudes can contribute to whether students accept and learn writing theory in the first place, before any transfer takes place. Students may simply dislike, or hold negative attitudes, towards disciplinary knowledge (such as threshold concepts of writing) and the lessons (or the general curriculum) that express such knowledge. Some students may find the writing knowledge useless, difficult, or as that which challenges their prior beliefs. In such cases, transfer would be difficult as students may be motivated to learn just for the sake of passing the course and to let go of the knowledge outside of the classroom. The issue of students’ resistance to learning theory will be discussed more in the section discussing the Elaboration Likelihood Model of persuasion, which explains the possibility of student’s being motivated to defend prior attitudes and to process lessons merely to reinforce negative attitudes towards disciplinary knowledge. For now, I want to merely suggest that persuasion may be a matter of utmost importance in writing pedagogy’s focus on transfer, because there may be a relationship between learning and practicing one’s learning and persuasion: students’ learning, holding onto, and practicing disciplinary knowledge, such as threshold concepts of writing, may be simultaneously linked to students’ positively evaluating (or holding positive attitudes towards) disciplinary knowledge and practices.

Before I explain any persuasive strategies to encourage students’ positive attitudes towards threshold concepts of writing, I will first discuss two theories, in order to explain how the strategy I discuss in the penultimate section (in which I suggest the importance of articulating the link between values and threshold concepts) follows and addresses such theories of attitude formation and change: 1) the theory of planned behavior, which suggests attitudes are linked to behaviors, only when an individual intends to engage in the behavior 2) the Elaboration Likelihood Model, which is a model of persuasion that explains how, why, when persuasion happens, and a model which spurs writing teachers to consider how the lessons in the classroom may invoke students’ defensiveness in maintaining prior beliefs about writing.

Attitudes Towards Knowledge and Behavior

Ajzen, Fishbein, Lohmann, & Albarracin (2019) explain that general attitudes toward an object does not predict behavior towards that object. For example, if students do hold positive attitudes towards writing theory, this does not guarantee that students would hold onto and apply the theory across contexts—or transfer their knowledge— just as we cannot assume that one simply liking a politician should predict that he or she will vote for the politician. However, according to Ajzen et. al (2019), an individual’s intention to engage in a behavior tends to highly predict behavior; but such an intention is based on the compatibility between an attitude and

behavior in terms of the “Target,” “Act,” “Context,” and “Time” (TACT). That is, liking writing theory (Target), and *also* liking the behavior of transferring that writing knowledge (Act) in a future classroom (Context) in the following year (Time), may predict student’s intention to transfer in that classroom in the following year. This is, students are more likely to engage in specific behaviors, such as transfer, firstly, if they hold positive attitudes towards writing theory, and secondly (perhaps more importantly) hold positive attitudes towards specific transfer behaviors as occurring in specific contexts. Furthermore, according to the the Theory of Planned Behavior, Ajzen et al. (2019) explain that intentionality is the antecedent predictor of a behavior, but such intentions to engage in a behavior are formed through three variables or beliefs that also contribute to positive or negative attitudes towards the behavior: 1) the individual reasons out beliefs about the positive and negative consequences of the behavior; 2) the individual also reviews beliefs about whether the behavior is promoted or demoted by people whom the individual respects or identifies with; 3) the individual considers beliefs about his or her perceived behavioral control or personal agency in overcoming potential obstacles to the behavior. Therefore, if we hope students transfer writing knowledge through repurposing and adjusting writing theory, and by engaging in the behaviors of active reading, listening, and interacting within communities, along with a potential of other knowledge-seeking behaviors, we need to encourage students to hold beliefs that 1) such behaviors will help promote positive consequences, 2) that such behaviors are or should be the norm for good writers, and 3) that students have the agency and self-efficacy to engage in such behaviors across contexts, while overcoming potential barriers.

The Theory of Planned Behavior opens up a bottleneck for my discussion. I do not yet know how we might help students to overcome the challenges students may face in different contexts, especially, because I do not know what those challenges might be. Perhaps repurposing writing knowledge and community engagement are more difficult in certain contexts, and there might also be personal obstacles or variables that prevent students from effectively engaging with, and thus transferring writing knowledge to, a community (for e.g., see Driscoll & Wells, 2012). I believe this requires further research into how diverse variables in personalities and contexts or communities can pose as obstacles to transfer behavior, or knowledge-seeking behaviors. Future research can consider how different mindsets or other solutions may help students address potential obstacles to community engagement and transfer behavior.

Yet what we might take away from the Theory of Planned Behavior is the need to encourage students to hold positive attitudes towards writing theory *and* specific behaviors that express the application of that theory in different contexts, by conveying to students several beliefs that address the three variables above. The next step is then considering how students might process these beliefs, because merely conveying to students the belief that there are positive consequences of transfer behavior, that such behaviors are the norm, and that they should be able to overcome potential obstacles, are not enough for all students to listen; some students may feel that what teachers convey through their lessons do not deserve their attention—and I believe motivation to listen or understand disciplinary knowledge is an issue especially in general education courses, such as freshman composition courses, which students are required to take. In such cases, any beliefs and information the teacher conveys may be disregarded. To address this issue, I will draw on the Elaboration Likelihood Model (ELM) of persuasion, because I believe the model provides insight into how students process the lessons we teach in the classroom as (at least, tacitly) persuasive messages which students either care deeply about or completely disregard. In the next section, I will discuss how ELM provides a framework for understanding what goes on as students process lessons about threshold concepts of writing, and also why students might resist such knowledge (for e.g., see Adler-Kassner, Majewski, & Koshnick, 2012).

Elaboration Likelihood and Resistance

Petty and Cacioppo’s (1986) The Elaboration Likelihood Model (ELM) discusses two ways by which attitude formation and change takes place as people process persuasive messages. I believe the ELM is crucial for teaching and learning, because students may be processing lessons and lectures in the classroom, not only as persuasive messages that convey positive attitudes towards a particular object (such as writing theory and transfer behavior), but also through the two routes of message-processing discussed in the ELM: either through the peripheral route or central route. Students may process our lessons through the peripheral, or low elaboration, route, when they have low motivation, ability, or high distraction, and thus process information under low-levels of thinking, relying on exterior cues, such as source and message attractiveness, to form an attitude towards the lessons that convey disciplinary knowledge. Thus unmotivated students or those who may have difficulty processing lessons may make evaluations about the knowledge based simply on cues such as

their first impressions about the teacher, or how exciting or boring the lesson, which conveys the knowledge, appears to be.

However, if students are motivated and have the ability to do so, students may process lessons through the central, or high elaboration, route in which students would engage in effortful thinking about the lesson. Such effort in high elaboration constitutes high quality and quantity of thoughts, including (but not limited to) integrating inferences, weighing the likelihood the knowledge in question possesses a particular attribute (such as usefulness), and engaging in metacognition (Wegener, Clark, & Petty 2019). For example, if students process lessons about writing theory under high elaboration, they may actively participate in trying to understand writing theory, and reflect on and question whether it possesses positive or useful attributes, perhaps in the context of their own lives, while even, metacognitively, reviewing their initial impressions about the theory. According to Wegener et. al (2019), the significance of the elaboration-route is due to research that shows how attitudes that have formed through high-elaboration last longer than attitudes formed through the peripheral route—that is, elaboration tends to create attitudes that persist over time and place. Therefore, if our goal is to have students transfer, such a goal should be interwoven with strategies that encourage students to elaborate on writing theory and transfer behavior, so that students form attitudes towards writing theory and specific behaviors that persist over time and place.

Furthermore, ELM also suggests some caution about elaboration. Simply motivating students to elaborate on the lessons is not enough, because high elaboration does not guarantee that students will hold positive attitudes towards the lessons. Wegener et al. (2019) discuss that even with high-elaboration, some individuals may be motivated to defend their prior attitudes, such as one's prior negative attitudes towards writing theory—and they will defend their attitudes through the process of elaboration. That is, effortful thinking, when interacting with the variable of a defense motive, may bias the processing of information, so that even when some students are highly motivated to think about their lessons, they may be simultaneously motivated to think in a way that will reinforce their negative attitudes towards writing theory, thus potentially reinforcing negative attitudes.

Research into transfer from Writing Studies provides some insight into why some students may be motivated to defend negative attitudes towards writing theory. Studies by Reiff and Bawarshi (2011) have shown that students who are confident in misconceptions of prior writing knowledge (such as the belief that writing is solely about mechanical competence, grammar, and about the individual author who writes only for his or her teacher so as to receive a grade), or those who are generally confident in their overall writing abilities, have difficulty in adjusting to new writing situations. Furthermore, the interaction between high confidence and problematic beliefs about writing is also seen by other studies from Writing Studies (Sommers & Saltz, 2004; Robertson, Taczak, & Yancey, 2014). From an attitudinal perspective, students' high confidence may be a reflection of students' strong positive attitudes towards prior beliefs about writing such as that writing in college (with the 5-paragraph format, for example) is the same in every classroom, with the writer solely speaking to his or her teacher, which might thus cause negative attitudes towards contradictory knowledge (from threshold concepts of writing) such as that writing is always context-specific and circulates cultural identities, expressions, and knowledge within communities. Given the possible motives to uphold positive attitudes towards prior beliefs about writing and negative attitudes towards writing theory, we need to consider ways for students to elaborate on our message without invoking a defensive motive.

I would suggest the importance of linking disciplinary knowledge to values as discussed in social psychology in order to address the two theories discussed above. The Theory of Planned Behavior suggests that if we want students to engage in specific behaviors, teachers may need to persuade students to hold positive attitudes towards both knowledge and the behaviors that express that knowledge (or transfer behavior); teachers must also convey positive beliefs about transfer behavior, in order for students to hold the intention (the antecedent to behavior) to engage in such transfer behaviors in the first place. However, the ELM suggests that students must be motivated to think deeply about the lessons that convey writing theory and transfer behavior, in order for students to hold positive attitudes that persists across time and place. ELM also suggests that the attitudes formed through high elaboration may not always be positive attitudes; while the ELM suggests the importance of motivation in elaboration, it also provides insight into the potential of invoking students' defensiveness when students are faced with contradictory beliefs and knowledge. Drawing on these theories, I will suggest simply one strategy to persuade our students: articulating the link that I believe already exists between threshold concepts of writing and the values students may hold of high importance. In the next section, I will discuss values as theorized by several social psychologists and explain how we might articulate to students that threshold concepts of writing and transfer behavior may help students fulfill their most cherished values.

Persuasion to Learn Disciplinary Knowledge and Practice Through Values

To introduce the concept of values in social psychology, I want to briefly discuss Scott's (2015) discussion of commonplaces (in his discussion of threshold concept 3): "in professional contexts... writers can gain credibility and persuasive power through showing they understand and share the beliefs and values that are commonplace, and markers of fuller socialization, within their professions" (2015, pg. 49). Scott suggests the persuasive power of invoking specific commonplaces relevant to a specific community or culture; I would suggest values also function as a kind of commonplace, except they may, as I will show below, transcend cultural boundaries, and thus may function as commonplaces that most, if not all students, have at least a tacit understanding of.

Schwartz's theory and circular model of human values are used in research into how values influence attitudes and behaviors. Schwartz (2012) explains that values are biologically and psychologically essential to all human beings, because values function as a kind of universal ideal, or, as Maio (2015) explains, guiding principles, which fulfill human needs of individual biology, social interaction, and group survival. Values "articulate appropriate goals" to fulfill such human needs through shared vocabulary, or "socially desirable concepts" (Schwartz, 2012, pg. 4). Schwartz defines these shared and socially desirable concepts as 56 values, divided into "ten value types," which include "power," "achievement," "hedonism," "stimulation," "self-direction," "universalism," "benevolence," "tradition," "conformity," "security." These values are placed under 4 more general categories of 1) "openness to change," which broadly defines values of creativity and independence of thought, action, and feelings; 2) self-transcendence, which broadly defines values of seeking the welfare and well-being of others; 3) self-enhancement, which defines values of individual achievement and power; and 4) "conservation" which defines values of preservation and protection of tradition and culture.

Furthermore, according to Rokeach (1973), values, or guiding principles, are central to the self-concept, or how we define ourselves. For example, our very professions with which we identify may be connected to specific values, even if we haven't explicitly defined "values" in the vocabulary of Schwartz's model. Teachers may be consciously driven by values of universalism (to help all students acquire a fair education), while conducting research for personal achievement, exploration, or creative purposes (for e.g. to fulfill achievement and self-direction values). Activists may fight for social justice, guided by the value of universalism, hoping for fairness and equality for all. People may work in large part to fulfill values of security, in order to protect and support their families. Perhaps we work to enjoy life and thus value hedonism, pleasure, adventure, and novel experiences. For many people, defining who they are—defining their self-concept—whether through their occupation, goals, or hobbies, may be simultaneously interwoven with the values that Schwartz describes in his model.

Drawing on Rokeach's theory that values are central to the self-concept, Steel's (1988) "self-affirmation theory" suggests that fulfilling values are also central to one's well-being. According to the theory, reflecting on values that one believes is highly important improves psychological well-being and may help mitigate defense motives that are caused by challenges to one's beliefs (Maio, 2017). Studies in self-affirmation theory have also shown positive neuroendocrine response, or positive hormonal reaction, to stress (Maio, 2017). Furthermore, self-affirmation has been used in research into health-related behavioral changes. A metaanalysis of several studies about self-affirmation and health behavior (Epton, Kane, Harris, and van Koningsbruggen, & Sheeran, 2015) has shown that self-affirmation promotes positive health intervention: specifically, when there is an interaction in an individual between reflecting on values and listening to persuasive health information, the individual is more likely to accept the health information and engage in positive behavioral changes based on the information.

Furthermore, as much as, or because, values are linked to how we define ourselves and our well-being, values are inextricably connected to many attitudes towards objects and behaviors (Maio, Haddock, & Verplanken, 2019). Some attitudes are influenced by an individual's identification with the values they hold in high importance (which are known as attitudes with a value-expressive function). Holding specific values in high importance may impact one's attitudes and behaviors towards many of the objects that one perceives to be relevant to the value. For instance, highly favoring self-transcendence values, and perceiving an object, such as threshold concepts of writing, or writing theory, as that which helps fulfill self-transcendence values, may cause one to hold positive attitudes towards the theory. However, in order for an (positive or negative) attitude with a value-expressive function to be activated (or reminded) by a specific object, such as writing theory, the object must be recognized as being linked to, or expressing, a specific value (Maio, 2017).

For example, students may recognize transfer-based writing curriculums that teach threshold concepts of writing, at least inherently, as fulfilling self-enhancement values, because the very purpose of transferring writing theory is that students learn writing knowledge in first-year composition class for the sake of writing in their respective disciplines of choice. While they may connect their future careers with diverse values such as self-transcendence or conservation, writing itself may only be a means to achieve success in the classroom on the path to practice their field. However, we should also consider motivational conflicts which are integral to Schwartz's circular model. The reason Schwartz arranges the values in a circle, is to represent how the ten value types and the four general categories are motivationally connected and conflicting: values that are placed next to each other (such as benevolence and universalism) are typically values that people will evaluate in the same manner, and thus evaluate as both being of high importance or low importance; values that are opposite of each other (such as self-transcendence and self-enhancement) are values that people will evaluate in opposition: people tend to favor one as being of high importance and the other as being relatively of low importance. Mao (2017) explains that research conducted in over 70 countries have supported such motivational congruence and conflicts within people's relative evaluations of each value.

If we consider motivational conflicts, we should consider that some students may instead be driven by values of self-transcendence, which are oppositional to self-enhancement; others may be driven by values of security and self-direction. Not all the students in a first-year composition class may be sure of their major and of their future, and not all students would be taken to the idea of writing as a means for success in higher education and in the workplace. If students hold different and diverging guiding principles with which they define themselves, and educators are interested in motivating as many student as possible, I believe that we need to articulate to our students how writing theory, such as the context-specific nature of writing, and transfer behavior, or knowledge seeking behaviors, such as active reading, listening, and other forms of engagement within communities, are also learning about ways to fulfill values of conservation, openness to change, and self-transcendence.

For example, we can articulate to students that we do not only write or hope to become stronger writers within the context of the university or workplace—nor do we ask questions and listen to other human beings merely within communities of a discipline. We might engage in these behaviors for the sake of understanding our loved ones—and to write to them. As threshold concept 4 states, there is always more that writers have to learn—and I would add that there is more that students can learn about the writing that takes place among their own families and friends, and within their own personal lives. To the extent that interacting and listening to members of a discipline is an effective strategy of understanding writing conventions and cultural commonplaces, such behaviors may lead to stronger understandings of the commonplaces that hold relationships together in our personal lives—such an understanding can be used as part of the rhetorical choices we make when writing to our friends and family. Thus threshold concepts of writing and transfer behaviors are an essential part of fulfilling values of security and benevolence—values that respectively means securing and protecting the internal harmony with family and friends, and supporting the well-being of the people to whom we are in close proximity (Maio, 2017).

Furthermore, we can explain that people write to an audience in seeking social justice and protection of the environment (to fulfill values of universalism). Effective writers might consider the type of communication and the genre that is most appropriate for the targeted audience, whether it be Twitter, Youtube, or an academic journal article; for the purpose of addressing purposes such as persuasion, writers may also seek to understand the unique culture and ideologies with which the target audience identifies. If one is targeting a community who does not believe in global warming in spite of scientific research, for example, writers may need to use more than scientific data for persuasion; writers may also need to read available texts, ask questions to, as well as listen and interact with, the members of the community, in order to understand the commonplaces and the complexities of beliefs and cultures that undergird the audience's perspectives and attitudes—or their resistance to scientific knowledge. Such an understanding can be used in deciding how to craft their persuasive writing in appropriate language for the community. For example, perhaps one can invoke specific aspects of a religion, or even the importance of family and preserving traditions and culture, in discussing the importance of protecting the environment. Furthermore, we can explain to students that writing theory and transfer behaviors facilitate values of hedonism or pleasure, along with self-direction or creativity. We write to form new human connections that are pleasurable and also explorative for the self. Such writing may be more effective when following behaviors that seek stronger understanding and appreciation of the people with whom we want to connect.

By articulating the relationship between threshold concepts of writing and transfer behavior and the fulfillment of values, I suggest that we are persuading students to hold positive attitudes towards threshold concepts of

writing and transfer behavior by describing the positive outcomes of understanding such knowledge and practicing such behaviors. I believe we are also establishing subjective norms, or promoting beliefs that such knowledge and behaviors are, respectively, what all effective writers understand and engage in to persuade or connect with either family and loved ones or diverse audiences. I am also suggesting that such an articulation may induce elaboration, encouraging students to care and think deeply about lessons that convey threshold concepts of writing and transfer behavior, to the extent that values are central to one's identity and well-being, and students understand how threshold concepts and transfer behavior can help fulfill their most cherished values. Furthermore, students' understanding the link between a discipline and all of our shared value may help address possible defensiveness or resistance, because articulating the link may cause students to reflect on the values that are important to them. However, to make sure students are affirming their values, mitigating potential defensive motives and their resistance to knowledge that is contradictory to their prior knowledge, writing teachers can encourage students to write about their most cherished values as part of the writing curriculum.

Conclusion: Teaching as Persuading and Persuading as Teaching

All teachers from diverse disciplines may benefit from the psychology of persuasion, and by drawing on the Theory of Planned Behavior and the Elaboration Likelihood Model when crafting their curriculums and lessons, because teaching may also be persuading, and learning in the university may be as much about acquiring disciplinary knowledge and practices, as it is about developing positive attitudes towards such disciplinary practices and knowledge. Perhaps, more often than not, simply claiming knowledge is true and useful may not be the only way to motivate students to process and elaborate on the lessons that convey the knowledge. Some students may be strongly opposed to particular scientific knowledge or disciplinary theories such as threshold concepts of writing, because of the prior beliefs that students bring into classroom. Furthermore, motivational conflicts in values suggests that not all students may be spurred to learn and practice their learning through achievement values. For example, students who perceive lessons in the classroom as being exclusively relevant to the fulfillment of achievement values, may not elaborate on their lessons, if they identify with values other than self-enhancement. Therefore, it may be useful to invoke the relationship between all of the values in Schwartz's model and the discipline's body of knowledge and practices, in order to motivate all students to elaborate on the lessons. Furthermore, such a relationship provides opportunities for students to write about or reflect on their own cherishes values, which may function to mitigate some students' defensiveness to hold onto contradictory prior beliefs they bring into the classroom.

I believe Writing Studies in particular may need to consider persuasion and values, because writing teachers are often tasked with teaching students out of high school who may lack the conviction and motivation of older students, while some of the students come with strong resistance to writing knowledge and practices that are different from that which they have learned in high-school. Furthermore, as writing teachers, we take on the objective of preparing students to write across the disciplines, exploring and incorporating into our curriculum strategies and pedagogies that helps students hold onto, transfer, and repurpose their learning about writing. Such a goal, I suggest, would be facilitated (and is interconnected) with students holding positive attitudes towards threshold concepts and transfer behavior. Thus writing teachers should articulate to students that threshold concepts of writing are interconnected with knowledge-seeking behaviors which ascertain the complexities of unique cultures a writer chooses to be a part of, whether for personal success, for building strong relationships, for creative purposes, or for social justice. We can explain that values fulfill biological needs, and writing is an activity that can address our personal and collective human needs, so long as we make choices in our writing according to our context and to the commonplaces we discover through reading, listening, asking questions, and engaging with other human beings.

References

- Adler-Kassner, L., Majewski, J., & Koshnick, D. (2012). The Value of Troublesome Knowledge: Transfer and Threshold Concepts in Writing and History. *Composition Forum*, 26.
- Ajzen, I., Fishbein, M., Lohmann, S., & Albarracin, D. (2019). The Influence of Attitudes on Behavior. In D. Albarracin & B. T. Johnson (Eds.), *The Handbook of Attitudes* (Vol. 1, 2nd ed., pp. 197-255). New York, NY: Routledge.

- Bazerman, C. (2015). Concept 2: Writing Speaks to Situations through Recognizable Forms. In E. Wardle & L. Adler-Kassner (Eds.), *Naming What We Know: Threshold Concepts of Writing Studies* [Kindle DX version] (pp. 35-37). Logan, Utah: Utah State University Press.
- Driscoll, D. L., Wells, J. (2012). Writing Knowledge and Skills: Writing Transfer and the Role of Student Dispositions. *Composition Forum*, 26.
- Epton, T., Kane, R. Harris, P. R., van Koningsbruggen, G. M. (2015). The Impact of Self-Affirmation on Health-Behavior Change: A Meta-Analysis. *Healthy Psychology*, 34(3), 187-196.
- Maio, G.R. (2017). *The Psychology of Human Values* [Kindle DX version]. New York, NY: Routledge.
- Maio, G. R., Haddock, G., & Verplanken, B. (2019). *The Psychology of Attitudes and Attitude Change* (3rd ed.) [Kindle DX version]. Oliver's Yard, London: Sage Publications Ltd.
- Matsuda, P. K. (2015). Writing Involves the Negotiation of Language Differences. In E. Wardle & L. Adler-Kassner (Eds.), *Naming What We Know: Threshold Concepts of Writing Studies* [Kindle DX version] (pp. 68-70). Logan, Utah: Utah State University Press.
- Petty, R. E., & Cacioppo, J. T. (1986). *Communication and persuasion: Central and peripheral routes to attitude change*. New York: Springer.
- Reiff, M. J. & Bawarshi, A. (2011). Tracing Discursive Resources: How Students Use Prior Genre Knowledge to Negotiate New Writing Contexts in First-Year Composition. *Written Communication* 28(3), 312-337.
- Robertson L., Downs, D. (2015). In E. Wardle & L. Adler-Kassner (Eds.), *Naming What We Know: Threshold Concepts of Writing Studies* [Kindle DX version] (pp. 105-121). Logan, Utah: Utah State University Press.
- Robertson, L., Taczak, R. (2018). Disciplinarity and First-Year Composition: Shifting to a New Paradigm. In R. Malencyzk, S. Miller-Cochran, E. Wardle, & K.B. Yancey (Eds.), *Composition, Rhetoric & Disciplinary* [Kindle DX version] (pp. 185-205). Logan, Utah: Utah State University Press.
- Rokeach, M. (1973). *The Nature of Human Values*. New York, NY: Free Press.
- Roozen, K. (2015). Concept 1: Writing Is a Social and Rhetorical Activity. In E. Wardle & L. Adler-Kassner (Eds.), *Naming What We Know: Threshold Concepts of Writing Studies* [Kindle DX version] (pp. 17-18). Logan, Utah: Utah State University Press.
- Rose, S. (2015). Concept 4: All Writers have More to Learn. In E. Wardle & L. Adler-Kassner (Eds.), *Naming What We Know: Threshold Concepts of Writing Studies* [Kindle DX version] (pp. 59-61). Logan, Utah: Utah State University Press.
- Russel, D. (1997). Rethinking Genre in School and Society: An Activity Theory Analysis. *Written Communication* 14(4), 504-554.
- Schwartz, S. H. (2012). An Overview of the Schwartz Theory of Basic Values. *Online Readings in Psychology and Culture*, 2(1). Retrieved from <https://doi.org/10.9707/2307-0919.1116>
- Scott, T. (2015). Concept 3: Writing Enacts and Creates Identities and Ideologies. In E. Wardle & L. Adler-Kassner (Eds.), *Naming What We Know: Threshold Concepts of Writing Studies* [Kindle DX version] (pp. 48-50). Logan, Utah: Utah State University Press.
- Sommers, N. Saltz, L. (2004). The Novice as Expert: Writing the Freshman Year. *College Composition and Communication*, 56(1), 124-149.
- Steele, C. M. (1988). The psychology of self-affirmation: Sustaining the integrity of the self. *Advances in Experimental Social Psychology*, 21, 261-302.
- Wardle, E. (2009). "Mutt Genres" and the Goal of FYC: Can We Help Students Write the Genres of the University? *College Composition and Communication*, 60(3), 756-789.
- Wardle, E. (2012). Creative Repurposing for Expansive Learning: Considering "Problem-Exploring" and "Answer-Getting" Dispositions in Individuals and Fields. *Composition Forum*, 26. Retrieved from <https://compositionforum.com/issue/26/creative-repurposing.php>
- Wardle, E. & Adler-Kassner, L. (2015). Metaconcept: Writing Is an Activity and a Subject of Study. In E. Wardle & L. Adler-Kassner (Eds.), *Naming What We Know: Threshold Concepts of Writing Studies* [Kindle DX version] (pp. 15-16). Logan, Utah: Utah State University Press.
- Wegener, D. T., Clark, J. K., & Petty, R. E. (2019). Cognitive and Metacognitive Processes in Attitude Formation and Change." In D. Albarracin & B. T. Johnson (Eds.), *The Handbook of Attitudes* (Vol. 1, 2nd ed., pp. 291-331). New York, NY: Routledge.
- Yancey, K.B (2018). Mapping the Turn to Disciplinarity: A Historical Analysis of Composition's Trajectory and Its Current Moment. In R. Malencyzk, S. Miller-Cochran, E. Wardle, & K.B. Yancey (Eds.), *Composition, Rhetoric & Disciplinary* [Kindle DX version] (pp. 15-35). Logan, Utah: Utah State University Press.
- Yancey, K.B., Robertson, L., & Taczak, K. (2014). *Writing across Contexts: Transfer, Composition, and Sites of Writing*. Logan, Utah: Utah State University Press.

Fighting with Infinity: A Proposal for the Addition of New Terminology

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Abstract: This paper proposes the addition of two new terms, “afinite” and “unfinite” to supplement the current terminology of “finite” and “infinite.” The restrictions of the current terminology used in science, math, and linguistics result in inaccurate conclusions. The new terms are defined both linearly and through the medium of a Punnett Square, and explained through both theoretical and applied uses. Articles using only the traditional terms reveal the shortcomings of using two narrowly defined terms. Using four terms, instead of the traditional two, results in more accurate and truthful knowledge. This paper does not attempt to determine whether specific theories, including Cantor’s set theory, Baye’s Theorem, or Chomsky’s Discrete Infinity Theory are correct or incorrect: it simply argues for the addition of two new terms in order to more accurately define ideas.

Keywords: Infinity, Finite, Afinite, Unfinite

Introduction

When I was a schoolchild, I was taught that a river held an infinite amount of water. This did not make a lot of sense to me- the world only had a finite amount of water in it, so how could a river contain an infinite amount? Nevertheless, all of us obediently memorized that a river could hold an infinite amount of water, and went on with our business. Except rivers don’t hold an infinite amount of water. They may hold a changing amount of water, but the amount is never infinite; in fact, infinity is a process, not a number, yet schoolchildren are still being taught that infinity is a very large number. While the science world uses “infinite” to sometimes refer to an incalculable number or amount, the math world fails to share this usage of the term “infinity.” Yet even in math, how does one define an incalculable number? Mathematicians may encounter an equation that is currently incalculable (i.e. 2 to the 10th to the 23rd), but that doesn’t mean it is infinite; the answer is very definitely finite, but no one can say exactly what the answer is.

Welcome to the Fight with Infinity

Science is not black or white, with no gray areas. Yet only two terms exist to define small and extremely small (or large or extremely large): finite or infinite. What about the gray areas that exist in between? A system with changing values is referred to as infinite, but it really isn’t; at any point in time, the quantity can be counted- it is not simple “infinite,” and to refer to it as such is both oversimplifying and inaccurate. The inaccuracy of using only two narrowly defined terms results in problems not just in the scientific field, but in many areas, including the field of linguistics. Since the planet Earth is considered a “closed” system, then everything on the planet is finite. Very few things in this world are truly infinite.

Definitions

Webster’s definition of infinite offers these parameters (Merriam-Webster, 2016):

1. extending indefinitely : endless <infinite space>
2. 2: immeasurably or inconceivably great or extensive : inexhaustible <infinite patience>
3. 3: subject to no limitation or external determination

4. **4a** : extending beyond, lying beyond, or being greater than any preassigned finite value however large <*infinite number of positive numbers*>

Finite is also defined:

1. **1a**: having definite or definable limits <*a finite number of possibilities*>**b**: having a limited nature or existence <*finite beings*>
2. **2**: completely determinable in theory or in fact by counting, measurement, or thought <*the finite velocity of light*>

“Finite” and “infinite” are two terms currently available to describe amounts. An item is either “finite,” or “infinite.” In other words, an item must have either definite or indefinite limits. The two terms fail to address, however, the ability to measure an inconstant amount. In other words, an item may be in a changing state, yet is measurable at any one point in time. For instance, suppose a river flows past a specific area. The flow of water is not measurable, unless time is stopped: at that moment, the amount of water can be precisely measured. But when the water is *moving*, the amount cannot be accurately measured. The water is not infinite; it is part of a closed system (the Earth), and only so much water exists. But current terminology describes the amount of water is *infinite*, which is not accurate.

“Finite” refers to an item capable of being definite and being limited, and “infinite” refers to an item being adefinite (to distinguish from the term “indefinite, which has multiple meanings) and limitless. No terminology exists for an item that has *changing measurements and changing limits*. “Afinite” could refer to an item that has changing limits; in other words, amounts or parameters could be measured at any single point in time, but the item is in a state of flux. Afinite could also be defined as “not limited, but not infinite.” The three terms, “finite,” “afinite,” and “infinity” would more accurately describe the three possibilities for limits (see Table 1):

Table 1. Finite, Afinite, and Infinite Definitions and Examples

Term	Definition	Example
Finite:	Definite; limited	3
Afinite:	Definite; unlimited	ϕ
Infinite:	Adefinite; unlimited	∞

A fourth term would be needed to complete the idea. Using a Punnett Square, the last item would have to be adefinite and limited:

		Limited	Unlimited
(applied)	Definite	<i>finite</i>	<i>afinite</i>
(theoretical)	Adefinite	<i>unfinite</i>	<i>infinite</i>

Figure 1. Punnett Square Designating Finite, Afinite, Unfinite, and Infinite

The fourth term would then be *unfinite*, defined as adefinite and limited.

Afinite is designated as an infinity sign with a vertical line; unfinite is designated as an infinity sign with a horizontal line through it.

Table 2. Finite, Afinite, Unfinite, and Infinite Definitions and Examples

Term	Definition	Example
Finite:	Definite; limited	3
Afinite:	Definite; unlimited	ϕ
Infinite:	Adefinite; unlimited	∞
Unfinite:	Adefinite; limited	∞

Four terms that would more accurately describe measurability and limitedness would be finite, afinite, infinite, and unfinite.

Infinity and Linguistics

Recursion

Recursion: “the determination of a succession of elements (as numbers or functions) by operation on one or more preceding elements according to a rule or formula involving a finite number of steps” (Merriam-Webster, 2016). To discuss recursion, let’s approach it first as an applied idea, and then a theoretical one.

Applied

In language, a recursive sentence might be: “Once there was a story that started as once there was a story that...” The word count in the story is not infinite; at any point in time, one could stop and count the number of words, and have a definite amount. But because the story is adding elements continually, it would be called afinite; not limited, but definite at a given point in time. In other words, the word count is always changing, but it is still definite at a specific point in time. In the applied world, recursion creates a sentence which is afinite; removing recursion results in a finite sentence.

Theoretical

Let’s look at the same recursive sentence from a theoretical standpoint: “Once there was a story that started as once there was a story that...” Theoretically, a person could tell this story forever; the sentence would be infinite. For the sentence to be theoretically infinite, one would have to assume that the sentence would stop eventually, but one has no way of knowing when, so the sentence is adefinite. To be truly infinite, one would have to be able to count the words that were spoken in the past. Infinite depends on the ability to count the words after they have been spoken, and the sentence has stopped. In the theoretical world, recursion creates infinite sentence: stopping a recursive sentence at an unknown future point in time would result in an infinite sentence.

Repetition

Repetition: “the act of saying or doing something again: the act of repeating something” (Merriam-Webster, 2016). Repetition is related to recursion, but not quite the same process. Let’s look at the following sentence using repetition: “I am very, very, very, very tired of all this thinking.” Repetition, therefore, is not the same as recursion (Corballis, 2011). Nevertheless, it does exist in language, and needs to be addressed.

Applied

The sentence, as written above, is finite. It has a definite ending, and the words can be counted (11). But let’s suppose the “very” went on ad nauseam: “I am very, very, very, very, very, very, very...” From an applied viewpoint, the sentence is now afinite. It has to momentarily stop at some time, the words be counted, and then continue.

Theoretical

“I am very, very, very, very, very, very, very...” Now our sentence is never-ending: infinite. Could the sentence be restructured to then be infinite? If we could assume that at some point, the sentence would end, but no one knew that point, we could then count the words that were spoken *in the past*, and end up with an infinite sentence.

Iteration

Iteration: “a procedure in which repetition of a sequence of operations yields results successively closer to a desired result” (Merriam-Webster, 2016). Like repetition, iteration is related to recursion, yet is also different. Iteration has an ending point at some time- recursion (as noted earlier) could theoretically result in an infinite

(never-ending) process, or a loop. Iteration, on the other hand, is a series of processes that build on the previous process, until the desired result is reached. Consider, for instance, this American classic:

100 bottles of beer on the wall,
100 bottles of beer,
You take one down, and pass it around,
99 bottles of beer on the wall.
99 bottles of beer on the wall,
99 bottles of beer,
You take one down, and pass it around,
98 bottles of beer on the wall.

(this goes on for quite a while, and then-)

1 bottle of beer on the wall,
1 bottle of beer,
You take it down, and pass it around,
No bottles of beer on the wall.

Is this simply repetition? No, because the condition changes with each successive verse. It is also not recursion, because the process has a definite stopping point- when the beer is gone. So is the song/situation finite, afinite, unfinite, or infinite?

Applied

Is the song/situation finite? Anyone can count the 100 bottles of beer, and that is all that exists. When the 100 bottles are gone, the song ends. A finite song. Could it be afinite? The singer could stop, and notice that he has 54 bottles of beer left, for instance, and then later is down to 35 bottles of beer, and then still later is at 20 bottles of beer. (Assuming he can sing and drink that long.) The number of full bottles is changing, but definite at any point in time, which describes the afinite condition.

Theoretical

Unfinite or infinite? Since the listener knows there are only 100 bottles, that fact rules out infinity. But suppose this was some sort of unhealthy drinking game, where the singer sings the song until he passes out. We know he starts out with a single bottle of beer, and at some point, he will stop singing, and depleting some of the 100 bottles of beer available. No one knows what that point is until it happens, so the situation could be considered unfinite, as we will eventually know the number of bottles of beer that were consumed, when the singer stops drinking. It is important to note that time plays a crucial role in determining whether a number of items can be described as finite, afinite, unfinite, or infinite. Most calculations currently assume that time has stopped, a practical yet inaccurate solution. The earth is moving, and few items stay still. Instead of labeling a changing number as infinite, (which is a process, not an amount), afinite and unfinite more accurately describe a changing number, value, or amount.

Vocabulary

Vocabulary: "all of the words known and used by a person" (Merriam-Webster, 2016). In terms of human vocabulary, many scholarly works state that language and/or vocabulary is infinite; that is, in a human's lifetime, he is capable of producing an infinite number of expressions. The idea is sound, but the terminology is inaccurate; it would be more truthful to state humans are capable of producing afinite (applied) or unfinite (theoretical) utterances in their lifetimes. Currently, with only two terms to choose from, the resulting literature can be quite inaccurate.

Literature Review

The headline question: Is language infinite? should perhaps invite more scrutiny than it's generally given these days. It was posited by Chomsky in the context of a particular view of language: "A small set of rules operating on a large but finite set of words, generates an infinite number of sentences" The problem with this definition is that it assumes a very bounded and discrete view of all elements: rules, lexical items, sentences. Language is not

organized in sentences and the difference between words and rules is likely an artifact of dictionary making and grammar writing. But even if we did assume that, there is no guarantee, that the actual number of possible sentences is infinite rather than just unimaginably and practically inexhaustibly large (as was argued by Pullum and Scholtz in 2010). As a matter of practical fact, while the set of possible expressions in a given language may or may not be infinite, the actual set of all expressions ever uttered (even if we ignore language death) is going to be finite (because we cannot ignore the heat death of the universe). Now, the set of expressions actually produced by humans (or even machines) is going to be too large to practically enumerate by current (and possibly any) technology but it's going to be finite. So it really does not matter whether language is infinite at all (other than to keep certain formal theories internally consistent). What matters is that any language is going to allow a set of expressions that is sufficiently large for any purpose a human language can be put towards (Lukes, 2014).

Language can be theoretically infinite both textually and diachronically, over time. It would probably be more accurate to use a term such as Alan Turing's 'infinite state', which he applied to computer memory which could always be added to, but would, at any point in time, be limited in actual use. At any given moment, however brief, there are a finite number of texts in existence, even though we couldn't calculate them and the number is changing all the time. A single neologism could offer trillions and trillions of new combinations, but the synchronic view is always finite; a closed system with a limited number of words that can combine in a limited number of ways cannot produce infinity. The fact that we couldn't get remotely close to exhausting a language's potential supply of sentences does not mean that it is not theoretically possible. Wilhelm von Humboldt seems to me wrong to believe that the finite can generate infinite variety; it can only be used infinitely through repetition (Flynn, 2003).

'Discrete infinity' refers to the property by which language constructs from a few dozen discrete elements an infinite variety of expressions of thought, imagination and feeling. For example, in English, sentences are built up of discrete units, words- you can have a sentence with 5 words, or with 6 words, but not with 5.5 words. And yet from these discrete units, one can create sentences of infinite length; there is no longest sentence. It is a property unique to human language (Llacerta, 2013). What sense is there in trying to envisage 'nearly discrete' objects being combined in 'nearly infinite' ways? A moment's thought should remind us that when objects are subject to even limited blending, the range of combinatorial possibilities crashes to a limited set (Knight, 2008; 2009).

Instead of assuming that topics come from a finite Dirichlet distribution, we assume that it comes from a Dirichlet process (Ferguson, 1973) with a base distribution over all possible words, of which there are an infinite number. Bayesian nonparametric tools like the Dirichlet process allow us to reason about distributions over infinite supports. We review both topic models and Bayesian nonparametrics in Section 2. In Section 3, we present the infinite vocabulary topic model, which uses Bayesian nonparametrics to go beyond fixed vocabularies (Zhai and Boyd-Graber, 2013). The writers of linguistic theory struggle with "infinity" and "finite," in that the terms aren't precisely accurate, but "close enough."

Discussion

But suppose terms such as "afinite" and "unfinite" were available? Humans would not possess an infinite vocabulary, but an *afinite* one. Also, humans would not be capable of producing an infinite amount of utterances, but rather an *unfinite* amount, which is absolutely more accurate. For simplicity's sake, let's use a willing human subject to illustrate exactly how these new terms would be applied: Bob.

Applied

Finite: We count all the words Bob knows, and Bob conveniently dies.

Afinite: We count all the words Bob knows now, and then count again later in the day, or maybe next month. The number can change, over time, but it is always countable.

Theoretical

Infinite: Bob never stops talking, and the words are uncountable.

Unfinite: Bob will eventually stop talking, but we don't know when, so we cannot calculate the number of words he knows or will know, only the ones he's uttered in the past.

By adding additional terminology, the ideas of language become more precise. And while the scenarios can change regarding Bob's (and our) vocabulary, the terms still remain relevant.

At any point in time, a human has a finite number of words at his disposal- i.e., words he uses, understands, or recognizes. But since a human changes over time, and his vocabulary changes along with him, his word count is actually afinite- (it changes over time, adding and subtracting words); it is never truly infinite. The number might be tremendously large, but it is still a finite number. Humans are not capable of producing an infinite number of words.

Suppose the longest word in American English consists of 100 letters, and the shortest word would consist of one letter. Mathematically, the number of words a human could generate would be 26 to the 100th power: 3.142931e+141. It's a very big number, but it is still a definite amount; thus, human vocabulary would be afinite, not infinite, in the applied study of language. The vocabulary is in flux, but is definite at any one point in time.

Discrete Infinity

"Galileo may have been the first to recognize clearly the significance of the core property of human language, and one of its most distinctive properties: the use of finite means to express an unlimited array of thoughts" (Chomsky, 2002 p. 45). Discrete Infinity, also known as "digital infinity" or the idea of "infinite use of finite means," basically theorizes that humans possess a digital mind in an analog world. (Darwinian theory would support that humans possess an analog mind in a digital world.) In very basic terms, humans have a finite mind in an infinite world. Rather than discuss which theory is correct, let's instead simply apply our new terminology to each idea. For simplicity's sake, we will resurrect Bob.

Darwin

Applied

Old terminology: Bob has an infinite mind in a finite world.

New Terminology: Bob has an *afinite* mind in a finite world. (afinite means we can measure Bob's vocabulary at various points in time.)

Theoretical

Old Terminology: Bob has an infinite mind in a finite world.

New Terminology: Bob has *unfinite* mind in a finite world. (unfinite means eventually Bob's mind will stop, and then his vocabulary will be definite.)

Chomsky

Applied

Old Terminology: Bob has a finite mind in an infinite world.

New Terminology: Bob has a finite mind in an *afinite* world. (afinite means we can count the items in Bob's world at various points in time.)

Theoretical

Old Terminology: Bob has a finite mind in an infinite world.

New Terminology: Bob has a finite mind in a *unfinite* world. (unfinite means at some point, Bob's world will cease to exist, and then his vocabulary will be definite.)

This paper is not discussing whether the theories of discrete infinity or Darwin's ideas are correct; it is simply introducing two new terms to more accurately describe ideas and/or theories in general.

Applications

With all this great information and new way of thinking, a question still exists: Why do we need 2 new terms, anyway? But *afinite* is all around us- it always has been. We've just been referring to it, (inaccurately) as infinite. Let's look at some real world applications for these two new terms:

Example 1

Suppose Jake wants to open a bank account, but he must account for the money.

Jake's bank account

Jake opened a bank account, and it was accruing interest.

FINITE

On the day Jake opened his bank account, he deposited 100 dollars in it.

AFINITE

The bank account has interest accruing continually.

UNFINITE

At some point, the bank account will close, and then Jake can count his money.

INFINITE

The bank never closes.

Example 2

Suppose Bob works in a doughnut shop, and he needs to know how many doughnuts are sold every hour. Since the number changes every hour, Bob might just say that he sells an infinite amount of doughnuts every day- except, that would not be accurate at all (and pretty exhausting!). Bob is really selling an *afinite* amount of doughnuts, as the handy chart below illustrates:

6 AM	127 doughnuts sold
7 AM	111 doughnuts sold
8 AM	212 doughnuts sold
9 AM	726 doughnuts sold
10 AM	513 doughnuts sold
11 AM	113 doughnuts sold

There really was not an *infinite* amount of doughnuts sold. Since Bob could count the amount of doughnuts sold every hour, he actually sold an *afinite* amount of doughnuts during the morning rush! If Bob were asked in the morning how many doughnuts he would sell by closing time, he would not have an accurate answer- that amount would be considered unfinite. In other words, Bob knows that at some point in the future, he will have sold a specific amount of doughnuts- but he does not know, at this time, what the total number will be.

After the doughnut shop closed for the day, Bob can tally his sales sheets, determine the daily total number sold (1,802), and his previously unfinite answer is now finite! If Bob were to sell doughnuts forever, he would sell doughnuts infinitely. (Infinity is a process, not a number.) Bob does not need to order an *infinite* amount of flour for the next 8 weeks' doughnut-making escapades- he needs to order an *afinite* amount. The amount will change every week, depending on business (see Figure 2).

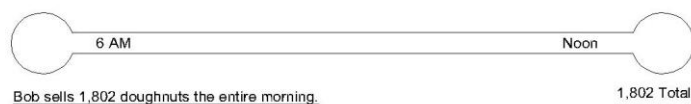
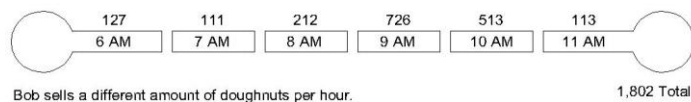
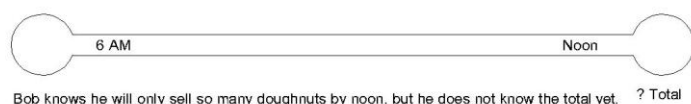
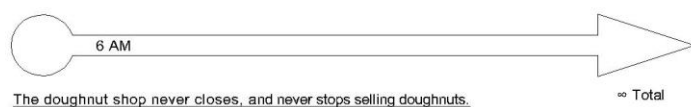
FINITE

AFINITE

UNFINITE

INFINITE


Figure 2. Application of Number Lines to Illustrate Finite, Afinite, Unfinite, and Infinite.

Example 3

Suppose a traffic light controller needs to know how many cars go through an intersection every hour, so she can accurately time the lights to handle the varying amounts of traffic.

Boss: How many cars go through the intersection every day?

TLC: An infinite amount, sir.

Boss: What? Order more roads built! Add more traffic lights! We'll never get to lunch!

Let's try that again, but using more accurate terminology.

Boss: How many cars go through the intersection every day?

TLC: An afinite amount, with the heaviest flow between 6-9 AM.

Boss: OK. Time the lights accordingly. Let's go get lunch!

Or, just to have fun-

Boss: How many cars will go through the intersection next year?

TLC: That would be an unfinite amount, sir, but I can let you know in 2 years.

Boss: But I need to know now, so I can request the next year's budget.

TLC: Last year's finite total was 240,726.

Boss: Great- let's go get lunch!

Example 4

And what if a teacher needed to order classroom supplies?

Teacher: Yes, I'd like to order an infinite amount of paper for my class.

Clerk: Of course, that will be...wait a minute...carry the 2...

Let's try that again.

Teacher: I need to order an unfinite amount of paper for my class.

Clerk: Of course, let's just look at your order from last year...

Teacher: I will need more this year- we're working on geometry.
 Clerk: Well, let's start with 12 boxes, and you can order more later.
 Teacher: Yes, that will be perfect. I don't know how much I'll need for the year, but I will know by mid- semester.
 Clerk: And by that time, we can work out the price for the year. Next, please?
 Coach: I need to order an infinite number of basketballs.
 Clerk: Of course, that will be...wait a minute...carry the 2...
 Coach: I need enough for the year.
 Clerk: How about the finite amount of 928 basketballs?
 Coach: Perfect!

Example 5

A physics student is working on a homework problem. He has a box with a peephole cut into it, and an unknown amount of marbles rolling around inside the box. The homework problem asks him to calculate how many marbles he can see through the peephole every five minutes, for one hour, when the box is shaken. He also needs to determine how many marbles are in the box (see Figure 3).

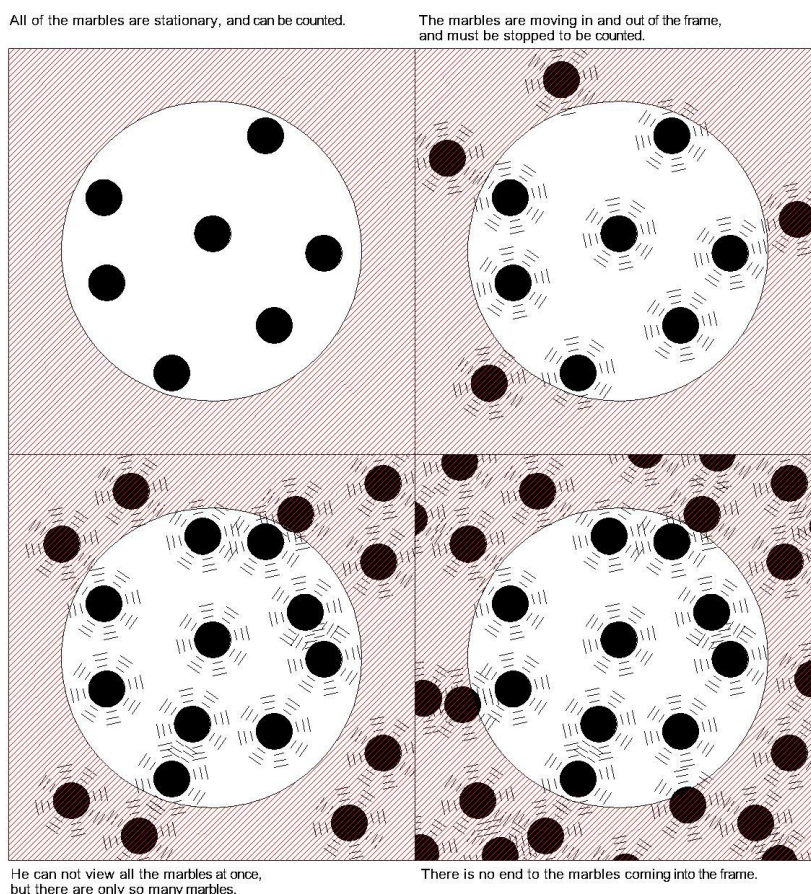


Figure 3. Chart Depicting Examples of Finite, Afinite, Unfinite, and Infinite.

It is much easier (and more accurate) to use *unfinite* and *afinite*!

Infinity and Math/Science

The science battles with infinity took a drastic turn for the worse with the advent of set theory in mathematics (Wolchover, 2013). Georg Cantor postulated and proved the idea of different kinds of infinities (Wolchover, 2013, and Chow, 2013). For example, consider the set of positive integers: it is indeed an infinite set. To

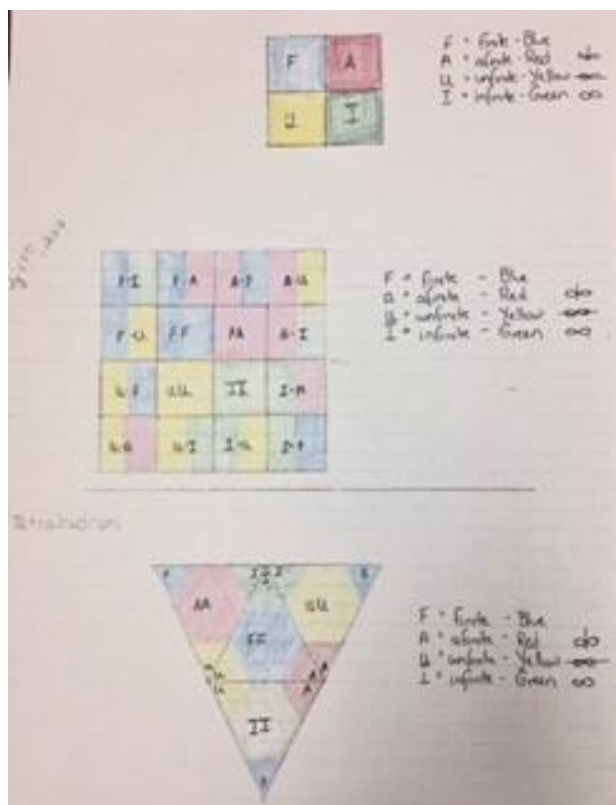
between the integers and the so-called real numbers (hence the continuum hypothesis). Cantor indeed did develop a rich taxonomy of the infinite: $\aleph_0, \aleph_1, \aleph_2, \dots, \aleph_\infty$ and so forth (Refs). However, these terms express sets of infinite cardinality, which we argue can only be assigned to a process and not necessarily a number variety. Thus, researchers, who do not have infinite amount of time, are still in need of more terms besides finite and infinite to describe the science that they perform.

Farmer Brown’s Field of Infinity: Applying multiple variables within Afinity Theory

One cannot work with Afinity Theory for very long without realizing that the universe is made up of multiple items. Once this realization takes place, the next logical step is to combine terms to describe the world surrounding us. But to do so requires some basic ground rules regarding notation, hierarchy of terms, and application of terms. To review, we start with the Punnett Square of Afinity:

		Limited	Unlimited
(applied)	Definite	<i>finite</i>	<i>afinite</i>
(theoretical)	Adefinite	<i>unfinite</i>	<i>infinite</i>

Note that all the terms are singular; that is, there is no combining of terms. Each term is isolated. But the universe is anything but singular items. If one were to combine terms, the result might be graphed as follows:



Both figures represent the same idea, but are presented in different formats. With the four terms now combined into all possible combinations, (including repeating terms), it is easy to apply the combinations with a real life example.

Farmer Brown

Farmer Brown grows organic Kamut, an ancient wheat grain. Because he contracts with a parent company, he must keep track of all the wheat he grows on his farm. He tallies the actual number of wheat plants, and the number of kernels found on each plant.

W = Wheat Plants

K = Kernels

Single Variable Example:

Finite = 100 Wheat plants

Afinite = Changing Daily amounts of Kernels

Unfinite = Future amount of Total Kernels produced

Infinite = The Wheat plants never stop producing Kernels

Two Variable Example:

Finite:

F-F = 100 W produces 2,000 K on a specific day.

F-A = 100 W produces various amounts of K on various days.

F-U = 100 W will eventually produce 2,000 K on the final day.

F-I = 100 W will continually produce K forever.

Afinite:

A-F = Changing amounts of W will produce 2,000 K on a specific day.

A-A = Changing amounts of W will produce various amts. of K on various days.

A-U = Changing amounts of W will eventually produce 2,000 K on the final day.

A-I = Changing amounts of W will continually produce K forever.

Unfinite:

U-F = A future final amount of W will only produce 2,000 K on a specific day.

U-A = A future final amount of W will produce various amts. of K on various days.

U-U = A future final amount of W will produce 2,000 K on the final day.

U-I = A future final amount of W will continually produce K forever.

Infinite:

I-F = A continually increasing amount of W will produce 2,000 K on a specific day.

I-A = A continually increasing amount of W will produce various amts. of K on various days.

I-U = A continually increasing amount of W will produce 2,000 K on the final day.

I-I = A continually increasing amount of W will continually produce K forever.

The notation for dealing with multiple terms, then, would be as follows:

1. F = Finite
2. A = Afinite
3. U = Unfinite
4. I = Infinite

One would write any finite information first, then afinite information, then unfinite and infinite information, respectively. Justification for this hierarchy of terms includes that all known terms are notated first, for ease of calculation. This hierarchy does not need to be rigidly adhered to, but is suggested as a standardization for calculations.

Conclusions

This paper introduces two new terms, *afinite* and *unfinite*, to more accurately describe the characteristics of language. The same terms can be applied to other fields of study, such as chemistry or physics. The new terminology may be more easily understood when using a Punnett Square:

		Limited	Unlimited
(applied)	Definite	<i>finite</i>	<i>afinite</i>
(theoretical)	Adefinite	<i>unfinite</i>	<i>infinite</i>

The new terminology does not change the premises or theories currently in use; it simply offers a more accurate vocabulary.

References

- Adam, B. (2011). What About Infinity? *Science 2.0*, 1 – 2.
- Chomsky, Noam (2002). On Nature and Language, 45.
- Chow, D. (2013). No End in Sight: Debating the Existence of Infinity. *Live Science*, 1- 3. Retrieved from <http://www.livescience.com/37077-infinity-existence-debate.html>.
- Corballis, Michael C. (2011). The Recursive Mind: The Origins of Human Language, Thought, and Civilization, 1-14.
- Flynn, R. (2003). Is Language Infinite? Retrieved from <https://www.usingenglish.com/speakingout/language-infinite.html>.
- Knight, Chris and Power, Camilla. (2008). Unravelling Digital Infinity, 1-6.
- Llacerta. (2013). Word of The Day: Discrete Infinity. Retrieved from <https://llacerta.wordpress.com/2013/01/20/word-of-the-day-discrete-infinity/>.
- Lukes, D. (2014). Is Language Infinite? 1. Retrieved from <http://linguistics.stackexchange.com/questions/8738/is-language-infinite>.
- Merriam-Webster Online. (2017). Retrieved from <https://www.merriam-webster.com/dictionary>.
- Porterfield, M. (2017/January 11) Personal Interview.
- Riley, Ola C. (2017/December 1) Personal Interview.
- Swendsen, R. H. (2012). An Introduction to Statistical Mechanics and Thermodynamics, 16-17.
- Tegmark, Max. (2015). Infinity Is a Beautiful Concept – And It’s Ruining Physics. *Discover Magazine*. 1-3. Retrieved from <http://blogs.discovermagazine.com/crux/2015/02/20/infinity-ruining-physics/#.WJJQ7RsrKUK>.
- Wolchover, N. (2013). To Settle Infinity Dispute, a New Law of Logic. *Quanta Magazine* 44, 1 – 6. Retrieved from <https://www.quantamagazine.org/20131126-to-settle-infinity-question-a-new-law-of-logic/>.
- Zhai, Ke and Boyd-Graber, Jordan. (2013). Online Latent Dirichlet Allocation with Infinite Vocabulary. *Proceedings of the International Conference on Machine Learning JMLR: W & CP volume 28*, 1-4.

Development and Sustenance of Indigenous Languages in Nigeria: The Role of Ninlan and Its Library

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Abstract: Nigeria has over 400 indigenous languages, few are developed, some are developing while the majority are not developed. It has been a problem teaching and learning with foreign languages in Nigeria hence the idea of establishing a National Institute for Nigerian Languages to bridge the gap. The institute was established under an Act in 1992 by the Federal Government of Nigeria. Its major mandate is to produce researchers and teachers. The Institute is to serve as a center for the teaching, development, preservation, retrieval, transmission, and utilization of Indigenous Languages and culture to ensure sustenance. This paper is set out to investigate the journey so far, constraints and prospects. This paper will investigate these issues using library information and participatory observation research methods, the study will suggest how the institute library can help to advance and enhance indigenous languages development and sustenance. The study is significant as it will serve as a template for the institute and Federal Government to assess their efforts so far and find avenues for improvement.

Keywords: Development, Sustenance, Indigenous languages, Library

Introduction

National Institute for Nigeria Languages (NINLAN) is one of the strategies the Federal Government of Nigeria embarked upon to improve its educational status. Its establishment can be seen as part of the federal government commitment to build a solid foundation for the realization of the educational and cultural policies of the nation.

One of the major constraints on the implementation of the National Policy of Education 'is the shortage of teachers of Nigeria languages who will help in educating the people in their native languages'. It has been a problem teaching and learning in Nigeria with foreign languages. Even though Colleges of Education and Universities produce such teachers, the number available has continually remained inadequate. It is in an attempt to produce a radical solution to this problem that the federal government of Nigeria announced the establishment of NINLAN in 1992. From the act which was used to establish NINLAN, the main functions are:

- A. To encourage the learning of Nigeria languages in an environment which shall prepare the students;
 - to speak the language fluently and acquire proficiency in teaching of Nigeria languages;
 - to acquire competence in research for problems on teaching Nigeria languages at all levels of education in Nigeria;
 - to award certificates, diplomas and universities degree to qualified students;
 - to adopt the theories and practice of using Nigeria languages into classroom practices especially for secondary schools, colleges, and the teaching and learning for non-native speakers of the Nigeria languages and
 - to stimulate general concepts, practice, and interest in communicating in Nigeria languages.
- B. To develop appropriate curricula to suit the needs of the various users of the institute.
- C. To operate for the benefit of-
 - Primary and secondary school teachers of Nigeria languages.
 - Tertiary educational institutions teachers of Nigeria languages.
 - Government and non-government personnel who are interested in acquiring communication skills in Nigeria languages.
 - Serve as centre for the exchange of information in the study of Nigeria languages and research centre in teaching and learning of Nigeria languages.
 - Compile, assemble and publish the results of researches into Nigeria language studies and make popular those findings where their general recognition, in the opinion of the institute, is of importance to Nigeria languages among others. (NINLAN ACT/Report 1992:5-6)

The establishment of NINLAN brought about an increase in teaching, learning, and research in mostly the three major Nigeria languages.

Workshops and conferences are organized yearly on topical issues that are aimed at strengthening the development and sustenance of the indigenous languages as well as its use in teaching and learning. In 2018 to be precise the Minister of Science and Technology and Minister of Education made declarations that the only way the nation can grow in Science and Technology is to start teaching Science subjects including Mathematics in our indigenous languages. This cry made NINLAN extend its tentacles to National Certificate on Education. They will produce teachers in subjects with a bias on Nigeria languages e.g.

- Mathematics/ Nigeria language
- Biology / Nigeria language
- Business education / Nigeria language
- Early childhood education /Nigeria language
- Christian religious studies /Nigeria language e.t.c.

This programme will take off by 2019/2020 academic session and the certificate to be awarded will be NCE. The plan for the B.ED degrees and diplomas are still on the pipeline, once the approval is received from the regulating bodies the Institute will take off. The acculturation programme organized by NINLAN in three centers across the nation ensure that NCE language students in the three major Nigeria languages in line with indigenous languages provision in education actualizes the mandate as a prerequisite for the award of their certificate. The aim according to Ikonne U.H (2013) is to stimulate (adapt to the cultural norms of host community over their original culture) and integrate (adapt to the cultural norms of the host community over their own) in the culture and languages of the host community.

The conversion programme for university graduates who want to train in Nigeria languages to enable them to teach effectively in their subject area is another NINLAN project. This program is producing some postgraduates in Annang language of Akwa Ibom state and others. NINLAN is doing her best to actualize her mandate which is to bridge the gap that non-use of indigenous languages have created in the educational system of Nigeria but they need to do more. NINLAN library on its part has been making effort to collect, store, preserve and disseminate the indigenous languages materials – primers, textbooks, storybooks and research results that have been produced. To appreciate, this paper better, we will look into situations that will encourage and ensure the development and sustenance of these indigenous languages.

Development and Sustenance of Indigenous Languages

Taking a closer look into Nigeria's linguistic situation, one can observe that there are many languages spoken in the country and this has classified Nigeria as a multilingual and multicultural society. Indigenous languages are those languages spoken by a specific group of people who are born within that environment. It can also be referred to as mother tongue which implies the language, in which a person is born, grows, conduct his/her everyday activities and even dies with it. In Nigeria there are about 400 languages, these languages have received little or no attention due to the preference of foreign languages. This choice has been affecting our educational and social sectors. Today the issue is not just the non-use of the language but their extinction. Many of the languages are dying at an alarm state. Crystal, D (2000) is of the view that the death of any language occurs when there are no more speakers, even if the language is documented and preserved in various forms. According to UNESCO in Johnmary (2012), Igbo language which is a major language spoken by more than 20million people may likely go into extinction by 2025, currently, it is classified as an endangered language.

To access the degree of endangerment of a language, an expert group constituted by UNESCO (2013-2018) identified the following factors;

- Intergenerational language transmission;
- The absolute number of speakers;
- The proportion of speakers within the total population;
- Loss of existing language domain;
- Response to new domains and media;
- Materials for language education and literacy;
- Language attitudes and policies;
- Governmental and Institutional language attitudes, policies, including official language status and use;
- Community members' attitude towards their own language.

From research findings of linguists, the majority of the indigenous languages are endangered. One can be tempted to ask “can anything be done to resuscitate and sustain them from further loss or death?” To answer the question we shall look at the following:

Transmission for Posterity

Balogun (2013) states that language transmission resuscitate and sustain the indigenous languages but the Nigerian people do not take pride in promoting the indigenous languages at home or at school. Crystal (2000) said there should be a concern for the death of these languages for these reasons;

- Languages need diversity;
- Language is an expression of identity;
- Languages are sources of history;
- Languages enrich the knowledge of human being and
- Languages stimulate thoughts.

The other reason why we should care for our languages, develop and sustain them is that they are a distinctive feature of human beings. The absence of language marks the end of human existence and its function are crucial to the existence of human beings hence a language dies when there are no more speakers of that language. To sustain the languages, they should be used at home, in the communities, for teaching and learning, for literary works and in information communication technology.

Research and Documentation

According to Emenanjo . E. N (1999.88) the three major/ National languages (Hausa, Igbo and Yoruba) have developed standard orthography and tests.

- They serve as regional lingua franca;
- they are studied as subjects in schools;
- they are recognized outside the country and
- they are accepted as a pre-requisite for admission into the tertiary intuition in some field of study.

The developing languages (Edo, Efik, Fulfulde, Isoko, Igala, Izon, Kanuri, Nupe and Tiv) lack the distinctions of the developed languages. They have orthography and few texts but are not recognized nationwide as language for national issues. The rest of the languages are underdeveloped. They are only used among the communities for communication. While all languages are apparently equal, some are more equal than others. Research and documentation should be encouraged to fast track the development of these minor or non-major languages and concrete efforts made to sustain them.

The Role of NINLAN in Development and Sustenance of Indigenous Languages

As the highest institution for the Nigerian language studies and use, National Institute for Nigerian Languages (NINLAN) should;

- Create forums for education on current trends and work out the modalities for the documentation of Nigerian languages;
- Run workshops to demonstrate new technologies in addition to what is currently in practice;
- Set up working groups to develop different areas of Nigerian linguistics, NINLAN should organize workshops on different areas of linguistics and connect both the experts, field workers, and teachers. They should be able to draw up what can be considered as best practices for the linguistic discipline;
- advice government on language issues;
- streamline the tools for language description and documentation as well as supervise their projects;
- harmonize the orthography for Nigerian languages;
- provide a website that can host documentation efforts of Nigerian linguistics ;
- provide facilities for search engine for Nigerian languages;
- collaborate with Linguistic Association of Nigeria (LAN), Department of linguistic and Nigerian languages, Nigerian Educational Research Development Council (NERDC) and other professional

bodies to develop modalities that can be considered as best practices as it relates development and sustenance of the indigenous language;

- Partner with the media to introduce to the communities the existence and relevance of the orthography in their indigenous language and
- Create awareness on the Mother Language Day which is celebrated annually every 21st February of each year. The reason for this awareness is to make communities participate in the celebration also to enable them to know the usefulness of their languages. It will publicize the activities of NINLAN as well. (Udoh, I. (2017:16), Asuoha, J. (2017:43), Ikoro, F. (2017:245).

NINLAN Library in Development and Sustenance of Indigenous Languages

It is sad to note that most communities do not have their constitution written or documented in their native languages. Nelson Mandela once said in his speech; “if you talk to a man in a language he will understand, that goes to his head if you talk to him in his mothers' language that goes to his heart’. Our mother language should be part of our whole being, developing and sustaining it is a task for everyone. A good response to indigenous languages endangerment is the idea of creating new discipline within linguistics called language documentation. According to Nikolaus (1998:10) the aim of languages documentation is to provide a comprehensive record of the linguistic practices and the characteristics of a given speech community, which differs from language description. To him, languages description is aimed at the record of a language as a system of abstract elements, construction, and rules. Documentation and preservation of languages will not only help the languages from dying but they can help in the retention of their cultural diversity.

The library plays a key role in man’s ability to record his thought, experience, history, culture, and heritage in his language and to make it available to others. During the medieval era, libraries helped a lot in the preservation of knowledge. The written records were originally in different book forms like clay tablets, papyrus roll, and Parliament codex. Ojo-Igbinoba(1995) It is a key function for libraries to preserve knowledge in any format possible. Libraries engaged in collection and preservation of thought, ideas, history, culture and heritage that are recorded using the languages of a people to ensure that such records survive time and age and they are transferred from generation to generation. It is obvious that the library is a language bank.

NINLAN library has made several efforts to preserve some indigenous languages both in written and spoken form. The issue of translating, cataloging, storing and disseminating information in the languages is the bedrock of their services. The scope of NINLAN library collection covers every available work written in or about Nigerian languages. Indigenous languages that have written materials in the library are;

Abua	Gokana	Ika	Kaje	Odua
Bekwara	Gure	Ikwo	Kambari	Tiv
Berom	Hausa	Isekiri	Kanuri	Urhobo
Bwatiye	Ibibio	Isoko	Manbila	Yaka
Ebira	Idoma	Izi	Mbembe	Yoruba
Edo	Igala	Izon (Ijaw)	Nembe	
Efik	Igede	Jibu	Nigeria Pidgin	
Fulfulde	Igbo	Junkun	Nupe	

(From NINLAN Accession register up to 2019)

The Suggested Role of NINLAN Library

There is a need to encourage indigenous language speakers to produce text in their native language. If textbook, primers, storybooks, operational manual, community constitutions, etc are written and published in indigenous languages and deposited in NINLAN library, it will go a long way in sustaining and ensuring language development in Nigeria. Technologies such as podcast can be used to preserve a spoken language, especially those of the old people who cannot read or write as well as rhymes, legendary tales and community traditions. According to Ikoro (2016: 89) the library can do the following in the development and sustenance of the languages;

- Identifying specific materials that will help the linguists and language developers in preparing orthographies, providing standardization and reference materials for the languages. When a language is standardized, it has achieved its first stage of development so it can be documented and preserved;

- Providing expert knowledge in the content of information resources in the indigenous languages and ability to critically evaluate and filter them before preservation;
- Engaging in active discussion with communities as it concerns the revitalization of historical documentary resources;
- Engaging in interlibrary loan and document delivery services to help language developers;
- Participating in knowledge preservation through ensuring the right of access to, and preservation of physical and digital contents of the languages;
- Participating in literacy and language awareness campaign with media among the communities of language speakers with the aim of sensitizing them on the need to transfer their languages and culture from generation to generation.

Constraints of Indigenous Languages

Lack of Use and Transmission of the Languages

Nigeria indigenous languages lack public image and acceptability. They are not used by their owners. These languages are threatened because parents prefer to communicate with their children in the English language than their mother tongue. Church pastors too prefer preaching in foreign languages to appear classy and well packaged. Ikoro (2017) It is imperative that Nigerians should pass on their languages to their children otherwise the languages will die. most school in Nigeria especially private schools'' prohibited the speaking of indigenous languages. The future generation is denied the opportunity to practice speaking their mother tongue.

Inadequate Vocabulary

Majority of the indigenous languages lack adequate vocabulary. In terms of use and translation, there are not enough words to describe or identify words in another language, teaching and learning become difficult when it concerns description and identification. Science and technology can hardly be captured by lexis and structure of these indigenous languages.

Threat of Extinction

The fate of a minor language is in the hands of the speakers. The death of any language occurs where there are no more speakers of the language, even if there are documented and preserved materials; they will no longer be useful. Most of the indigenous languages are threatened because the language owners have not taken pride in promoting them at school or at home.

Lack of Government Interest

The Nigeria government has little or no interest in the development of indigenous language, from the inception of National Policy on Education till date, not much has been done to enforce the policy and no money is voted for the development of this minor languages. NINLAN that was set up to handle the issues of these languages is continually underfunded. The facilities and structures needed for effective implementation of the programs are grossly inadequate and often not available. Their preference of English language as the Lingua Franca in the nation will continue to subdue the indigenous languages.

Emerging ideas of Science and Technology as well as their Terminologies

Without standardize orthography and adequate vocabularies, most of the indigenous languages cannot develop further than where they are now because globally they are not recognized or relevant. Terminologies in science and technology, information communication technology a generally new words that emerge every day in the medical field, etc are impoverishing the indigenous languages. It is based on these that the indigenous languages are criticized and seen as lacking the capacity to participate in the current trend of events.

Political and Tribal Issues

The growth and actualization of NINLAN mandate have been inhibited and truncated continually by the federal government that establishes her due to lack of funds and support. National University Commission (NUC) for personal interest, political and tribal reasons has vehemently refused to approve that the institution becomes degree awarding institution for the past twenty-six years. The committee that set up NINLAN recommended initial intake of 300 students per year for decree programmes this dream has not been actualized.[The act of NINLAN had a small error of referring 'senate' as 'Academic board'. It has been hell trying to amend the act for 26years.]

Prospects of Indigenous Languages

Language Research

The development and sustenance of indigenous languages depend so much on intensive language research. Research in the area of phonology, morphology, syntax, and grammar can enhance the use and ensure the sustenance. Research on how to develop the standard orthography of the minor language should be a task for NINLAN and other stakeholders if these indigenous languages will survive.

Revitalization of the Languages

Adzer, V.C.(2012:2) suggested revitalization of indigenous languages as a means to secure the sustainability of endangered languages. Programmes that will lead to the revitalization of the languages cannot be overemphasized e.g. the use of mother tongue or language of the immediate community in educating the pupils and students. Developing teaching and learning resources, workshops, seminars, and conferences and establishing an active learning and teaching centers to resuscitate the languages.

Documentation of the Languages

According to Ikoro, F (2017) to avert language loss, language shift, and language death, documentation is necessary. Documenting the languages will help develop and sustain them. Electronic documentation will preserve their quality and content for future study by linguistics. Publication of texts, primers, storybooks and community official documents are also required. Documentation of indigenous languages will entail cost effectiveness by the government. For our languages to be documented, an initial step towards analyzing and documenting them is the provision of standard orthography and the development of large vocabulary.

Establishment of Database

The establishment of a database for all Nigerian languages, the standardization, and harmonization of their orthographies, while developing tools that will ensure their use in Information Communication Technology (ICT) is recommended by Wamalma and Oluoch(2013). The achievement of these objectives requires commitment from the government as it will entail providing funds and encouraging linguistics to be involved.

Educating the Native Speaker

There is a need for rural people's enlightenment, literacy, and awareness of the status of their language. This step will help develop and sustain the languages and engender nationalism that will ensure the preservation of the languages. Making the languages subjects of study in Primary and Secondary schools will raise awareness on the importance of the languages. Using the languages for mass media and different areas of publicity can help sustain them. Establishing association with the aim of promoting the speaking of the languages can also help for instance NINLAN once established (Otu Suwakwa Igbo in 2010 i.e. Association for speaking Igbo). The aim is an emphasis on the Igbo language must be spoken by and to all within NINLAN and all Igbo communities.

Partnership with Stakeholders

The development and substance of indigenous languages is demanding, that is why stakeholders should team up to get effective result. an institutions like NERDC, LAN, Department of linguistics and Nigerian languages in various universities, National Museum and Archival centers and Community libraries should pull resources and ideas together to achieve the goals and objectives of NINLAN and the Federal Government.

Language Use

A language lives are as long as the speaker is using it. Indigenous people of Nigeria should discourage the unpatriotic attitude of the natives, church pastors, and private schools owners to move on with the language. The faith of any small language depends on the language owner. Speak your language and keep it alive.

Conclusion

This paper discussed the role of NINLAN and its library has been playing and can play in the development and sustenance of indigenous languages. It suggested what the library can do to solve the problems of lack of standard orthography, poor language transmission, low vocabulary, the threat of extinction, etc. The paper observed that NINLAN can handle constraints of the indigenous languages if it is supported holistically by government and stakeholders.

Recommendation

NINLAN and its library are financially handicapped to carry out their elaborate mandate. The government should release funds to sponsor the production of orthographies, vocabularies, and terminologies in science, information communication technology, mathematics and new areas of knowledge to accommodate the new scientific and technological concepts. The core program of the institute which is 4years degree program should be approved by the regulatory body (National University Commission NUC) to enable NINLAN to achieve its mandate as well as the federal government getting satisfaction on the reason why it established NINLAN.

NINLAN should partner regularly with media houses to air the activities of the institute and federal government, should once in a while give subvention that will take care of this program. The institute should organize more seminars, workshops, conference, competitions on indigenous languages. Language owner interested authors and NERDC should be encouraged to write books, primers, storybooks and community history in the languages. NINLAN libraries should be furnished with all the necessary facilities that can help in collection, documentation, preservation, and dissemination of indigenous languages information.

Modern technologies for language documentation, a podcast for oral languages storage should be provided and adequate staff employed for these duties. Librarians should once in a while be sponsored to move into the community to create awareness on their roles for indigenous languages development and sustenance then partner with the community leaders/ language developers to source the appropriate research materials for their work. Translation department in NINLAN should partner with the library to get most government materials on indigenous languages translated into the languages that are available so far in the library.

References

- Adzer, V.C. (2012) Factors militating against the development of indigenous languages: the Tiv language in perspective. *Journal of Igbo Language and Linguistics*. 5 (5) Online – [Http: // www. linguisticsafricana.com](http://www.linguisticsafricana.com)
- Asuocho, J.C. (2017) The role of NINLAN in the Development and Sustenance of Nigeria's Indigenous Languages. *NILAS* 3(2) 38 – 45.
- Balogun, T. (2013) An endangered Nigerian Indigenous Language: the case of Yoruba language.

- African Nebula no.6 71-81
- Crystal, D. (2000) Language death. Cambridge: Cambridge university press.
- Emenanjo, E.N (1992) A standard Orthography, implications for written text in a developing language. Paper presented at Isekiri orthography conference organized by the centre for the study of Isekiri language and culture, Warri, Nov. 27 – 28.
- Emenanjo, E.N and Bleambo, P.K (1999) Language endangerment and Language empowerment in Nigeria: Theory and reality. Aba, unique press.
- Federal Government of Nigeria (1992) Report of the committee on the establishment of the National Institute for Nigerian languages. P 5-6
- Ikonne, U.H (2013) Acculturation/Immersion programme at the Institute for Nigerian languages, University of Nigeria Aba campus. Paper present at a workshop on Acculturation/Immersion programme of NINLAN.
- Ikoru, F.M (2016) Library and Information Service for Nigerian Languages Development: Challenges and Prospects. In *The Challenges of Change: Sustaining the Gains of I.C.T. in Libraries for Sustainable Development*. NLA Abia state chapter conference proceedings 89-92
- Ikoru F.M (2017) Language Documentation and Information Preservation for Sustainable Development. *Journal of the National Institute for Nigerian languages*. NILAS 3(2) 240-249
- John-Marry, A. (2012) UNESCO Prediction on the Extinction of Igbo Language in 2025: Analyzing Societal and Transformative Strategies. *International Knowledge Spring Platform* 2(8)110-117
- National Institute for Nigerian language Act (1993 no 117) 30thDecember (A.15939 k). http://www.placng.org/new/laws_of_Nigeria3.php?Sn=312
- National Institute for Nigerian languages Library Accession Register (2019)
- Nikolaus, P.H (1998) Documentary and Descriptive Linguistics. *Linguistics: Berlin de Gruyter*: No 36; 161-195.
- Ojo – Igbino, P.H (1995) History of Libraries and Library Education. Lagos:UTO Publishers
- Udoh, I.I (2017) Nigerian Language as a Key to Sustainable Development Goals. *Journal of the National Institute for Nigeria languages*, NILAS 3(2) 10-18.
- UNESCO (2012) Why Language Matters for the Millennium Development Goals. Bangkok: UNESCO Publication.
- UNESCO (2013) Language Vitality and endangerment. UNESCO Ad Hoc Expert Group on Endangered Languages. <http://www.unesco.org/new/fileadmin/mill/mi/DIA/HOC/pdf/6-7>
- Wamaluwa, E. and Oluochu, S. (2013) Language Endangerment and Language Maintenance: can Endangered Indigenous Languages of Kenya be Electronically Preserved? *International Journal of Humanities and Social Sciences* 3(7) 258-265

Korea's Economic Vulnerability Group Analysis of Mental Health Differences According to Health Behavior

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Abstract: In this study, The 2016 Korea National Health and Nutrition Survey was used to determine if there was a difference in mental health according to the group's (Korea's Economic Vulnerability Group and Normal Groups) health behaviors. The subjects of the study were 367 economic vulnerability group and 708 normal groups, and data analysis was performed by two-way ANOVA. The results of the study are as follows. The results showed that there was statistically significant difference in the subjective health form ($F = 6.181$, $P < .01$), and no significant difference was found in the drinking, smoking, leisure physical activity and work physical activity. These results indicate that the mental health of the economic vulnerability group and the normal groups differ depending on the type of health that individuals think. This suggests that health care campaigns or programs that individuals perceive should be different for the economic vulnerability group.

Keywords: Mental health, Leisure, Vulnerability, Physical activity

Introduction

Everyone has the right to enjoy the same, but not everyone enjoys the same rights (Universal Declaration of Human Rights, 2019). Korea has achieved short-term economic development that has not occurred in the world among the war-torn countries, but the economically disadvantaged population is estimated to be 8% of the total population (Seo, 2018). Although the government supports various policies for the life of economically disadvantaged people, the benefits are lacking in terms of physical activities and health behavior that prevent disease. The purpose of this study is to analyze the difference of mental health according to the health behaviors of the economic vulnerability group and normal groups.

Method

Sample

This study used primeval data of the 7th 2016 National Health and Nutrition Survey conducted at the Disease Headquarters. The subjects of the study were selected from those who participated in the physical activity survey of the National Health and Nutrition Survey of 2016, and then excluded subjects who did not respond to the mental health scale or not. Finally, 368 basic economic vulnerability group recipients were selected as research samples and 708 random samples were selected for the control group (see Table 1 and 2).

Table 1. Participant Characteristics

Variables	Economic Vulnerability Group		Normal Groups		Total		
	N	%	N	%	N	%	
	Total	368	34.2	708	65.8	1076	100
Gender	Male	140	38.0	315	44.5	455	42.3
	Female	228	62.0	393	55.5	621	57.7

Table 2. Participant Responses

Variables		Economic Vulnerability Group		Normal Groups		Total	
		N	%	N	%	N	%
Subjective Health	Good	135	36.7	141	19.9	276	25.7
	Normal	159	43.2	368	52.0	527	49.0
	Bad	74	20.1	199	28.1	273	25.3
Drinking	Yes	143	13.4	393	36.5	536	49.9
	No	225	20.8	315	29.3	539	50.1
Smoking	Yes	90	8.2	127	11.8	217	20.0
	No	282	26.0	577	54.0	859	80.0
Leisure Physical Activity	Yes	269	73.1	591	83.5	860	79.9
	No	99	26.9	117	16.5	216	20.1
Work Physical Activity	Yes	207	56.3	420	59.3	627	58.3
	No	161	43.8	288	40.7	449	41.7

Results

In order to achieve the goal of this study, we analyzed the difference of mental health according to the health related behaviors of the economic vulnerability group and the normal group. In the subjective health form ($F = 6.181$, $P < .01$), there were differences according to the economically disadvantaged and general class. After Scheffe's post-hoc to verify group differences, mental health was the highest in the group considered healthy, followed by mental health in the normal group. In addition, there were no differences in mental health between the economic vulnerability group and normal group of drinking, smoking, leisure physical activity, or work physical activity. In addition, there were no differences in mental health between the economic vulnerability group and normal group on drinking, smoking, leisure physical activity, or work physical activity (see Table 3).

Table 3. Analysis of Differences

	M^2	F	P-value	Eta^2	Power	post-hoc
Drinking	4.572	.240	.624	.000	.078	
Smoking	54.881	2.575	.089	.003	.399	
Subjective Health	95.874	6.181	.002	.011	.892	A<B<C
Leisure Physical Activity	.297	.016	.900	.000	.052	
Work Physical Activity	46.779	2.471	.116	.002	.349	

Subjective Health: A=Good, B=Normal, C=Bad

Discussion

The purpose of this study is to analyze the difference of mental health according to the health related behaviors of the economic vulnerability group and normal group. As a result, there was a difference in subjective health and no difference in other activities. These results are in part due to the results of a comparison between the depression, fatigue, and sensory improvement effects of the regular exercise group and the non-exercise group

studied by Sadeghi Bahmani, Kesselring, Papadimitriou, Bansi, Puhse, Shaygannejad and Brand (2019). In other words, mental health due to drinking, smoking, leisure physical activity, and physical activity did not differ between the two groups, but it means that there is a difference in subjective health. This suggests that health care campaigns or programs that individuals perceive should be different for the economic vulnerability group.

Recommendations

The following recommended for further study. Do not limit the dependent variable to mental health, but you need to do it expand. In addition, regression analysis of the difference in mental health according to the level of health behavior is necessary.

References

- Sadeghi Bahmani, D., Kesselring, J., Papadimitriou, M., Bansi, J., Pühse, U., Gerber, M., Shaygannejad, V., Trachsler, E, H., & Brand, S. (2019). In patients with Multiple Sclerosis (MS) both objective and subjective sleep, depression, fatigue and paresthesia improved after three weeks of regular exercise. *Frontiers in psychiatry*, 10, 265.
- Seo, Man-il (2018). Early Civil Affair Policy in the Korean War: Busan's refugee control and relief and economic recovery. *seogdangnonchong*, 72(0), 267-297.
- United Nations (2019). *Universal Declaration of Human Rights*. international law.

Role Models and Mentoring Relationships: Preferences Expressed by Hispanic Students Attending Hispanic-Serving Institutions

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Abstract: A sense that there are a limited number of role models at colleges and universities for Hispanic and other minority students has been a concern of researchers in higher education for a number of years but little is actually known about who Hispanic students consider a role model. Similarly, researchers have investigated the impact of mentoring relationships on success in college and persistence for majority and minority students, yet little is known of the preferences students studying at Hispanic-Serving Institutions have regarding mentors and whether Hispanic students at these institutions have expectations that differ from those of their peers. An NSF-funded investigation gathered data in both these areas. Findings from two surveys, one with responses from 464 students at 14 Hispanic-Serving Institutions and the other with responses from 746 students at a comprehensive, regional state university and two community colleges from which the university receives transfer students, are discussed. The first survey set the context for the second and its sample came from colleges and universities in New Mexico and Texas. The sample for the second survey is isolated to north Texas. On the first survey, students at HSIs were asked three general questions about mentors and to select types of individuals they saw as role models from a list of six short descriptions and to select all that applied from a list of eight characteristics desired in role models. The second survey included similar patterns but all the questions targeted mentors and mentoring relationships. Responses on both surveys include three primary findings. At the HSIs represented, the preferences of Hispanic students regarding role models and mentors are different from their non-Hispanic peers in several key ways. Their preferences appear to be related to cultural identity and to primary language for those who have English as their second language. The Hispanic students in the second survey were also more likely than their non-Hispanic peers to submit low ratings of the understanding representatives of their institution had of the student's culture. This occurred for all forms of engagement listed: advising/mentoring, instruction, tutoring, financial aid assistance, scholarship services, career services, and student organizations.

Keywords: Hispanic-serving institutions, Hispanic students, Role model, Mentor, English as a second language

Introduction

Various college student success models suggest that enculturation within and identification with institutions or relationships established with individuals representing institutions of higher education are important for improving student retention and graduation. The seminal student retention and success models developed by Terenzini and Pasarella (1980; 1991), Vincent Tinto (1993), and Alexander Astin (1993) are examples of this. More contemporary examples are myriad like recommendations made in Upcraft, Gardner, and Barefoot (2005), Castellanos and Gloria's (2007) Psychosociocultural Model of College Success for Latinx students, Santiago, Taylor, and Calderón's (2013) list of institutional characteristics that can increase the potential of success for

Hispanic students studying science, technology, engineering, and mathematics (STEM), and the compendium of information related to Hispanic college students in Batista, Collado, and Perez II (2018). Support programming and supportive relationships with college personnel are regular features in these discussions. Survey research was completed to increase understanding of college students' perspectives of two groups of persons who can motivate and support them, role models and mentors. The investigation was specific to students who attend Hispanic-Serving Institutions (HSI) and sought to understand what the students perceived about the impact of role models and mentors and the characteristics they desire in persons they admire and from whom they accept guidance.

Undergraduate students attending Hispanic-Serving Institutions (HSI) were asked questions about persons in both categories, role models and mentors. Role models were considered the broader construct with mentors as a subset of the group. The intention was to understand whether there were distinct preferences among Hispanic students in respect to role models and mentors while also identifying whether there were commonalities in the characteristics desired for both. Having this information is important as supporting and relating to students is a basic premise of student success theory and practice and is particularly emphasized regarding minority students (Castellanos & Gloria, 2007; Santiago, Taylor & Calderón, 2013; Upcraft, Gardner & Barefoot, 2005). It is important to have information of this type regarding HSIs due to the concentration of Hispanic students at Hispanic-Serving Institutions. Revilla reported that "2016-17 enrollment data shows...14% of all institutions of higher education (492 HSIs) enrolled 65% of all Hispanic undergraduates" (Revilla, 2018, para. 2). Understanding the experiences and perspectives of these students is critical to appropriately facilitating their education.

Definitions

For the purpose of the study, a distinction was made between role models and mentors. Role models were viewed as the broader construct with mentors as an overlapping but narrower concept. Role models were defined as individuals whose lives, character, or actions a person admires and may wish to emulate. Like Thevenin, Elliott, and Bigelow (2016), this included persons who inspire and motivate although they may not be directly involved in an individual's relational network. Mentors were, again like Thevenin, Elliott, and Bigelow, viewed differently as individuals who provide guidance, expert assistance, and, potentially, psychosocial support. Both constructs were considered from the perspective of students. That is, the type of person students attending HSIs desire as role models or mentors and, to a more limited extent, their experience with persons in these roles.

Review of Relevant Literature

Searches of the literature were conducted regarding the phrase role model and the term mentor. For both topics, the searches sought three types of information. First, general information about the concepts, as defined above, within the context of higher education and from the student perspective. Second, material describing the concept or its application at HSIs. Third, publications describing the concept or its application to Hispanic students at HSIs. This activity was completed using resources provided by a university library. A customized search function that combines outcomes from multiple education and social science databases was the primary tool employed. The two primary search terms used were role model(s) and mentor(s) with the intention of capturing the greatest volume of possibly relevant material. Within the broader searches, the terms higher education, college, university, Hispanic-Serving Institutions, Hispanics, and Hispanic students were used to sort results.

Role Models of College Students

There is very little material in the literature about the persons chosen as role models by college students in the United States and the characteristics students desire in a role model. Only two journal articles were found that addressed the topic and neither was specific to Hispanic-Serving Institutions and the students who attend them. Three other publications indirectly addressed the topic by touching on relational networks and the influence of personal characteristics of the role model and of the student.

In 2001, Elzubeir and Rizk conducted a study of medical students, interns, and residents. Completed in a graduate student and medical setting, the study found, among other things, that students ranked mentor

personality among the top three desired characteristics in the quantitative response set and that qualitative data placed emphasis on personal characteristics like being positive, respectful, and knowledgeable. This study of a graduate student population was the closest equivalent to the researchers' investigation of the characteristics desired in role models by students at HSIs although it focused on a graduate student population and was not conducted at an HSI.

Scase and Turnbull (2013) investigated whether students who are the minority gender in an academic and professional field "place a significant value on the gender of their instructors and, if so, in which roles... lecturers/instructors, project supervisors...[or] personal tutors" (p. 98). While considering a desired personal characteristic of an instructor from the perspective of undergraduate students, Scase and Turnbull did not make a distinction between role models and mentors. Their use of the phrase role models included persons that might be classified as mentors in the authors' work, especially "project supervisors...[or] personal tutors" (p. 98). They found "gender-minority students attach very little value to the gender of the academics they interact with, unlike their peers" (p. 98). Majority students were found to consider instructor gender "important...when in the gender-majority or within gender-balanced departments, and then only in the role of personal tutor" (p. 98). Like Elzubeir and Rizk (2001), personal characteristics of role models were found to be important to students, in this case for majority-gender undergraduate students.

Thevenin, Elliott, and Bigelow (2016) completed "a quantitative survey administered to 587 students enrolled in construction management courses at three universities" (p. 162). They sought to understand the impact of having role models and mentors. They found that over 80% of the students "reported having a person who influenced their academic decisions" (p. 162), that a family member was the person most frequently reported as having influence, and that females reported having a person fill this role more than males. While focused on the presence and impact of role models and mentors rather than the desired characteristics of these persons, the study findings noted the presence of a person(s) within a student's relational network who have influence on decisions made regarding academics.

Johnson (2014; 2017) looked at the effects of having a female instructor, the person classified in the study as the role model, on student self-efficacy and grades. Several effects were noted but the investigation focused on student outcomes associated with studying under a female professor. A "positive association [was] found between self-efficacy for self-regulated learning and academic success" (2017, p. 151). This is connected to the topic at hand by showing impact of a personal characteristic of the role model.

Parent and Oliver's (2015) investigation included the influence of role models on undergraduates studying psychology as well as the students' "attitudes toward research, and knowledge of internship-related issues" (p. 55). The results from data about "220 undergraduate students from across the United States and Canada who intended to pursue graduate training in psychology" (p. 55) revealed that socio-economic status (SES) of the student was associated with the degree of influence exerted by role models. Students with a higher perceived SES were more likely to report being influenced by role models. This is the most tangentially related of the articles. A personal characteristic was found to be associated with influence exerted by role models, but it is a personal characteristic of the student rather than the role model.

As noted above, no publications were found about role models in the context of Hispanic-Serving Institutions. The search for information specific to Hispanic students attending HSIs produced the same result. Thus, the topics discussed below address multiple gaps in the literature. These are identification of characteristics desired by undergraduates in their role models and a consideration of role models specific to HSIs, their students, and, within that group, Hispanic students attending HSIs.

Preferences Regarding Mentors Expressed by College Students

Ehrich, Hansford and Tennett stated "The sheer volume of literature on mentoring across a variety of disciplines is an indication of the high profile it has been afforded in recent years" (2004, p. 518). Their analysis of hundreds of articles demonstrates the volume of material and diversity of topics addressed in this area. This emphasis has continued in recent years with: (1) consideration of conceptual models for mentoring (Baker, 2015), (2) discussions of approaches (Walter et al, 2016) and competencies (Wyre, Gaudet & McNeese, 2016), (3) consideration of mentoring for junior faculty (Mazerolle, Nottingham & Coleman, 2018), as experienced by deans (Reeves, Throne, Bradley & Piferi, 2015), and for minority faculty (Terrion & Leonard, 2007; Zambrana et al, 2015), (4) the impact of faculty mentoring programs on student outcomes (Elliott, 2018), (5) issues

associated with mentored research (Welfare, Sackett & Moorefield-Lang, 2011), (6) descriptions of mentoring programs (Edwards et al, 2011; Crooks, 2013) and, (7) specific processes employed with students like peer mentoring (Fleck & Mullins, 2012; Gartland, 2012; Kalpazidou-Schmidt & Faber, 2016), mentoring minority students (Luedke, 2017), mentoring of minority students studying STEM (Mondisa, 2015), and mentoring of African-American doctoral students (Strothers, Justice, & Lugg, 2017).

While mentoring and even mentoring of undergraduate students has for years been a regularly addressed topic in the literature of higher education, there is a limited volume of information about the characteristics undergraduate students desire in mentors. None of the publications cited above address this matter. The authors were also unable to locate publications about mentoring enacted at HSIs and specific to Hispanic students attending HSIs although one study of mentoring for Latina faculty was found (Alcaron & Bettez, 2017). These gaps in the literature were addressed by the study described below.

Method

An exploratory, sequential, mixed-methods investigation was conducted. It began with literature review followed by qualitative data gathering in focus groups at a conference and through interviews and continued to quantitative survey research. A sequential exploratory pattern was deemed appropriate as there was little extant information about the topics under investigation, which made qualitative investigation and triangulation between data sources then elucidation and validation with a larger sample the preferable approach. As an exploratory investigation the overall research questions were broad but included foci within topic areas. This discussion addresses a specific subset of ideas, who students at HSIs consider to be role models, which characteristics are important to them in role models and mentors, and their level of interest in mentoring. To understand how students at HSIs, and especially the Hispanics at the schools, thought about these constructs, they were asked about: (1) who they identify as role models and mentors, (2) characteristics they desire in role models, (3) their perception of the importance of having a mentor, and (4) characteristics valued in a mentor. Literature review was conducted when crafting the project plan and following funding by the National Science Foundation (NSF). Data collection occurred in a variety of forms: (1) topic-specific focus groups conducted during each concurrent session of the *Consejos Colectivos* conference at El Centro College in February of 2018, (2) semi-structured interviews with students and representative stakeholders from groups that had been underrepresented in the focus groups, and (3) surveys of students at HSIs in a seven-state region. All research materials and methods were submitted for review and approval by the Institutional Review Board (IRB) at West Texas A&M University (WTAMU).

Focus groups with faculty, staff, and administrators from HSIs were conducted at the *Consejos Colectivos* conference in Dallas at the end of February 2018. Persons working for non-profit groups that supported or advocated for Hispanic students were also welcomed as informants. The discussion prompts for these conversations were developed based on information from the literature, input from representatives of the Texas Association of Chicanos in Higher Education (TACHE), suggestions offered by members of the conference organizing committee, and the experience of members of the research team. There were three focus group topics and a set of questions specific to each. The question sets can be found in Preuss et al (2019). The focus group participants were selected at random from the list of conference registrants.

Student participants at the *Consejos Colectivos* conference were purposefully excluded from the focus groups. This decision was made for two reasons. First, students might have been intimidated by the faculty, staff, and administrators in the focus groups. This could impact their willingness to speak and the content of their responses. Second, the higher education professionals in the focus groups might have altered the topics addressed in their responses with students present. It was felt that these were sufficient reasons to exclude students. This, however, meant that to have student input in the initial stage of the research another form of data gathering was necessary. Short, semi-structured interviews were planned to fill this gap. Similar interviews were also planned as a means of filling any gaps in representation left by random selection of focus group participants. With several faculty members, staff persons, and administrators participating in each of the focus groups, the only informant gap was for advocates. Even though this was the case, a small number of interviews were completed with female administrators from HSIs as the count of female administrators in the focus groups was lower than that of male administrators.

Immediately following the conference, student, advocate, and female administrator interviewees were sought. In all cases a convenience sampling pattern was enacted. Interviewees were sought through the personal networks

of members of the research team. Eight students were interviewed. One male and two females who were students at HSIs that were comprehensive, regional state universities. The remaining students attended community colleges that were HSIs. Four were male and one was a female. All the students attended college in Texas. Two advocates were interviewed. One was a male and one was a female. Both served in leadership roles for non-profit organizations. The male was a full-time employee of a non-profit in a metropolitan region of Texas. The female was a volunteer leader of a state-wide non-profit whose full-time role was as an administrator at an emerging HSI. Two female administrators were also interviewed. One worked at a regional, comprehensive state university and the other at a community college. The interviews were recorded and transcribed.

The qualitative data, focus group and interview transcripts, were divided into two groups, input from students and material supplied by faculty, staff, administrators, and advocates. All members of the research team completed open coding of each transcript (Kolb, 2012). The student interviews, the smaller set, were coded first. When each team member had completed coding the student interview transcripts, meetings were held in which line-by-line discussion of codes was completed and a common codebook negotiated. The same process was completed subsequently for the focus group transcripts and for the administrator and advocate interviews. The result was two corporate codebooks, one representing faculty, staff, administrator (FSA) and advocate data and a second representing the student data.

The codebooks were used to develop surveys in conjunction with the Psychosociocultural Model of College Success for Latinx students (Castellanos & Gloria, 2007) and the work of Santiago, Taylor, and Calderon (2015). Initial survey questions were written by Dr. Preuss and discussed by the group with alternative questions suggested by team members in meetings. The questions were refined through corporate discussion across more than a dozen meetings all of which lasted multiple hours. A survey was developed for distribution to students at Hispanic-Serving Institutions in a seven state region (AR, CO, KS, LA, NM, OK, TX). A second survey for faculty, staff, and administrators at the same institutions and in the same region was also developed.

Both surveys were subjected to piloting and assessment of face validity. The student survey was piloted with a group of ten student volunteers at WTAMU and the faculty, staff, and administration survey was piloted with a small number of faculty and staff at WTAMU. The surveys were reviewed for face validity by representatives of TACHE. Both surveys were administered using the Qualtrics survey platform.

While deployed simultaneously in the spring of 2018, the means by which participation was solicited diverged for the FSA and student surveys. As this report addresses the student survey, the means of soliciting FSA participation will not be discussed. The link to the student survey was distributed in several ways. A broadcast e-mail was sent to over 1,500 employees at 119 HSIs in the seven-state region asking them to forward a survey link to students at their institutions. In addition, 31 persons who attended the *Consejos Colectivos* conference had agreed to act as "Research Champions." These persons were contacted via e-mail and provided an IRB approved e-mail for use in soliciting survey participation from students at their institution. A third means of distributing the survey link was provided by the Texas Association of Chicanos in Higher Education. TACHE's leadership distributed the survey link to their membership via e-mail. Finally, the research team solicited participation in the survey at WTAMU by approaching students in the dining commons and the student center. The survey remained open for a three-week period at the end of the spring semester in 2018. Once the survey was closed, the responses were downloaded to an Excel spreadsheet. A total of 587 students at 15 colleges and universities in Colorado, New Mexico, and Texas accessed the survey. The research team reviewed the file and cleaned the data of inconsistent and incomplete responses which left a total of 464 usable response sets from students attending the 14 HSIs in New Mexico and Texas. Statistical analyses of responses were conducted using SPSS and methods appropriate to each form of data.

In the spring of 2019, the research team revised the student survey. This involved removing some queries that had proven ineffective, adding a demographic marker, rephrasing some questions, shifting response patterns to 0 to 10 scales from select all that apply and five-point Likert scales, replacing the original familism and locus of control questions with valid and reliable question sets, and shifting the focus of a subset of questions from role models to mentors. The revised survey was deployed sequentially at three Hispanic-Serving Institutions with the permission of the appropriate administrators at each institution. By the mid-fall of 2019, 830 persons had accessed the second student survey. Responses from outside the population of interest and that were without usable information were excluded from data analysis leaving 746 sets of responses. These were subjected to statistical analysis using the SPSS software package and methods appropriate to each form of data.

Results and Discussion

An approximate total student headcount for the 14 institutions represented in the 2018 student survey was calculated by accessing quick facts pages and fact books on institutional websites, data on the US News & World Report Best Colleges webpages, and data from collegefactual.com. The most recent headcount of undergraduate students at each institution was employed to calculate an estimated count of the potential respondent pool. The combined total of undergraduate students at the 14 institutions was calculated to be 172,271. The 464 usable responses exceed the threshold needed for a 95% level of confidence with a 5% margin of error for a population of that size. The total count of possible respondents for the 2019 student survey, compiled from two institutional fact books and one communitycollegereview.com profile page, was 29,575 undergraduates. The 746 usable responses exceed the threshold needed for 99% level of confidence with a 5% margin of error.

While all students attending the HSIs where the surveys were distributed were encouraged to participate, this report concerns itself primarily with the responses from students who identified as Hispanic. A total of 213 of the 464 respondents on the spring 2018 survey identified as Hispanic (45.9%). A total of 307 of the 746 respondents to the 2019 survey identified as Hispanic (41.2%). These figures align with national, regional, and institution specific figures for the percentage of Hispanic students attending HSIs (Revilla, 2018). The data set was also found to be representative in respect to the ratio of males to females.

Findings Regarding Role Models

The spring 2018 survey included a group of questions about role models. This construct was defined as an individual whose life, character, or actions a person admires and may wish to emulate but allowance was made in the phrasing of the queries for this person to be within or outside the student's relational network. This allowed responses from persons who saw a relative as a role model as well as from persons who viewed a professional they had never met as a role model.

The first set of questions about role models was a set of seven statements and informants were asked to select all that applied. The last statement listed was "Having a role model at my college is important to me." A total of 48.0% of the Hispanic students responded this was the case. This response rate was not significantly different than for non-Hispanics in the sample who had 41.0% agreement. The full wording for each of the six remaining statements followed a uniform pattern. The first was "There are faculty and staff at my college that I think of as role models." The second was "There are students at college that I think of as role models," etc. There were two points at which there were statistically significant differences in the response patterns of Hispanics and non-Hispanics were found. Hispanic students were more likely to consider "faculty and staff at my college" and "Hispanic faculty and staff at my college" as role models. There was a weak effect for each finding.

The second set of questions on the 2018 survey regarding role models was a list of eight statements from which informants were asked to select all that applied. The prompt preceding the list was "The following are important to me regarding role models." From the responses, a rank ordered list can be constructed of persons who are seen as role models by Hispanic students attending HSIs and the characteristics valued in role models by the same students. The rank order for persons reported as role models was as follows.

1. Members of my family (70.0%).
2. Faculty and staff at my college (64.8%).
3. Students at college (50.2%).
4. Well-known people (49.3%).
5. Members of my community (39.4%).
6. Hispanic faculty and staff at my college (35.2%).

These rankings have three clear strata, family members and faculty and staff with response rates at or above 65%, students and well-known people with response rates of approximately 50%, and members of the individual's community and Hispanic faculty and staff at the student's college with values below 40%. The low ranking for Hispanic faculty and staff may be related to the underrepresentation of Hispanics in higher education. The National Center for Education Statistics (n.d.) reported that in the fall of 2016 only 5.0% of full-time faculty in the United States were Hispanic.

The characteristics of role models that were important to Hispanic students who attend HSIs can also be rank ordered by the percentage of responses. This list also has natural break points in the values dividing it into

upper, middle, and lower tiers. The first four characteristics are in the upper tier, the next two the middle tier, and the last two the lowest tier.

- | | |
|---|---|
| 1. Is encouraging (83.1%). | 5. Is easy to find and regularly available (52.6%). |
| 2. Has information that can help me (75.1%). | 6. Understands my culture (51.2%). |
| 3. Has overcome barriers (70.4%). | 7. Is Hispanic (28.6%). |
| 4. Actively reaches out to me with helpful information (63.8%). | 8. Speaks Spanish (21.6%). |

These two lists appear instructive but they do not consider whether Hispanic and non-Hispanic students in the sample had similar perspectives. They also do not include the possibility that other factors in addition to ethnicity could impact role model preferences. Based on comparison of responses from Hispanic and non-Hispanic students, the following are a more accurate summary of findings regarding role models.

- The Hispanic and non-Hispanic students at the HSIs did not differ significantly in the importance assigned to having a role model at their college or in their selection of members of their family, fellow students, well-known people, and members of their community as role models.
- Hispanic students in the sample were more likely, with weak effect size, to identify faculty and staff at their college and Hispanic faculty and staff at their college as role models.
- Hispanic and non-Hispanic students reported different preferences, at highly significant levels with weak up to strong effects, regarding the characteristics they desire in a role model with “understands my culture” (51.2% vs. 31.3%), “is Hispanic” (28.6% vs. 1.2%), and “speaks Spanish” (21.6% vs. 1.6%) as the items that were the least important to non-Hispanics (see Table 6 for a full listing of percent agreement by ethnicity).

With the data showing such wide spread and in several cases pronounced differences, the question of why the differences exist arises. To consider impact of other factors, the responses of the Hispanic students were disaggregated. This was done by gender, age, institution type (two-year and four-year), personal identification with Hispanic culture, identification with STEM, employment status (both employed versus not employed and 20 or fewer vs. 21 or more hours a week), years of school completed, and primary language. There were two language classifications, English as the primary language (EPL) or Spanish as the primary language (designated as English as a second language - ESL). As a large number of comparisons were made, only the statistically significant findings are reported here.

Students who learned English as their second language were more likely, 45.2% to 30.0%, to consider faculty and staff at their college as role models than their Hispanic peers who learned English as their primary language. This relationship had a weak effect size. Hispanic students who agreed or strongly agreed with the statement “I identify as a STEM student” were more likely to consider members of their family as role models with a moderate effect size while students at community colleges were more likely to consider members of their community and well-known people as role models, 54.8% to 35.7% and 69.0% to 44.4% respectively. Both comparisons had weak effect sizes.

The finding regarding family members parallels an outcome for role models of students in construction management courses, “family members were reported most frequently as the person of greatest influence” (Thevenin, Elliott & Bigelow, 2016, p. 162), but the combination only suggests that there may be some pattern rather than leading to a conclusion. The most that can be said is that there appears to be a number of factors that can impact choice of role models for Hispanic students attending HSIs. Among these are primary language, identification with STEM, which could be the connection to the construction management study, and whether the student attends a community college or a four-year institution.

The results of statistical analysis for characteristics desired in role models by Hispanic students appear to show a trend. Four of the five significant findings, all with weak to moderate effect sizes, are related to language and culture. That students who have English as a second rather than primary language would value parties as role models, in order of effect size, who are Hispanic, speak Spanish, understand their culture, are encouraging, actively reach out with helpful information, who have overcome barriers, who have information that can help the student, and who are easy to find and readily available is not surprising. What might be considered unexpected is how consistently the differences occurred even though many of the items listed were also desired in role models by non-Hispanics. This is informative. It suggests an interactive effect of culture and primary language in choice of role models for Hispanics who have ESL status. The related finding with a moderate

effect size, Hispanic students who identify with Hispanic culture desiring a role model who understands their culture, 56.0% as opposed to 5.0% for those who did not identify with Hispanic culture, can be seen as supporting the interaction of language and culture in respect to role models.

The last significant comparison, that interest in a role model who actively reaches out with helpful information increases with years of college experience is also informative. There was a moderate effect size for this finding. As the proportion of traditional aged to non-traditional aged students did not vary between the Hispanic and non-Hispanic subsets, it appears that the more experience Hispanic students have in college, the more they value proactive provision of helpful information by persons they consider to be role models. This finding crosses over into the concept of mentoring as the more experienced or recognized person is proactively engaging the student.

Findings Regarding Mentors

The 2019 survey preparation was informed by outcomes from the work completed in 2018. Adjustments were made to the survey by eliminating some queries and adding others, shifting the focus from the broader set, role models, to a narrow construct, mentors, and moving from select all that apply and Likert-scale questions to 0 to 10 rating scales, or even broader scales, whenever possible. Due to the changes in the instrument, disaggregation of responses could be completed in difference ways than for the 2018 data set. Means of disaggregation employed when considering the responses in respect to mentoring were gender, age, cultural identity, first-generation student standing, institution type, employment (working or not working), number of hours worked in a week, years of school completed, current course load (credit hours), annual income of household of origin and for the student's household, primary language (EPL or ESL), and fluency in Spanish. As a large number of comparisons were made, only the statistically significant findings are reported below.

For the survey in 2019, several questions about mentoring were added and the role model question set was reduced in size and shifted to address mentors. There was, though, a query on the first survey about mentoring that was not been described above and that was retained, with revision, on the second survey. The question stem in 2018 was "The people who provide this service do not understand my culture." Respondents were to select all that apply to the stem from a list of seven types of institutional engagement with students. These were advising, mentoring, tutoring, math, writing or other study labs, financial aid office, career services, and student organizations. The percentage of students agreeing with this statement, as it was phrased in the negative, was the information sought. There were no significant differences between the responses from Hispanic students and their non-Hispanic peers in the sample for these forms of engagement.

The revisions made to the question in 2019 were to rephrase this prompt as a positive statement, "The people who provide this service understand my culture," switch from a select all that apply response to a ten-point rating scale for each of the forms of engagement, change the labels for some forms of engagement, combine two forms under one label, and add two forms of engagement. The new list was instruction/teaching, financial aid office, tutoring service/lab, advising/mentoring, student organizations, scholarship office, and career services. Advising and mentoring were combined as one category since a student's academic advisor often provides guidance in addition to checking and certifying individual academic plans and course enrollment. At many institutions, a student's advisor, faculty member or full-time academic advisor, is their primary point of regular contact with the institution and an important source of guidance on a variety of matters.

The median score for the advising/mentoring prompt was 6 and the mode was 10. That separation between the middle score and the most frequent score demonstrates a broad spectrum of opinion. When the responses were disaggregated into Hispanic and non-Hispanic student populations, a strong statistically significant difference was found. Hispanics students were far less likely to agree that advisors/mentors at their institution understood their culture. As noted above, advising/mentoring was the first of seven forms of engagement for which the students were asked to provide a rating. Analysis revealed that all six of the other descriptors also exhibited strongly significant differences along ethnic lines. The Hispanic students felt that their cultural background was less understood by institutional employees than their non-Hispanic peers in all the categories of engagement listed. In every case, there was a moderately small effect size. That this consistent pattern occurred is a concern given the emphasis on cultural congruity and limiting acculturative stress (Castellanos & Gloria, 2017) in student support theories that focus on serving Hispanic students.

In addition to disaggregation by ethnic identity, the data set for Hispanic students regarding the advising/mentoring prompt was analyzed in all the other ways noted above. The only comparison that resulted

in a statistically significant difference was between community college students and their peers at the four-year institution. The Hispanic students at the two-year schools were more confident that their advisors and mentors understood their culture than the respondents from the four-year institution. That there was only one four-year school included in the data set is important to note. It is possible that the difference found is related to characteristics of that institution.

There was a series of nine other queries specific to mentoring on the 2019 survey. Three addressed general concepts related to mentoring. The general queries were: (1) "Having relationships with faculty impacts staying in school." (2) "Having a mentor impacts staying in school." And, (3) "Having a mentor at my college is important to me." The six remaining queries addressed characteristics desired in a mentor. These prompts were a modified version of the question on the 2018 survey regarding characteristics desired in role models. The overall response to the three general prompts was positive. The median scores were all seven or above and the mode was 10 in each case. Comparisons of the response patterns between the Hispanic and non-Hispanic students found very little difference. The students appear, from the data to see relationships with faculty and mentors as influencing student persistence and to have an interest in a mentoring relationship with a representative of their institution.

When the Hispanic student responses for the first three prompts were isolated and disaggregated in the other ways, significant findings occurred for two of the general mentoring prompts in respect to years of college completed. There was a moderate positive association (Shortell, 2001; Laerd Statistics, 2018b) between the level of agreement with the statement "Having a mentor impacts staying in school" and the number of years of college completed. There was a weak positive association between ratings of agreement with the statement "Having a mentor at my college is important to me" and years of college completed. These two findings suggest that Hispanic students learn about the impact and value of mentoring in college over time, although the means by which this learning takes place cannot be identified with data from the survey, with the result that they have an increased appreciation for mentoring later in their academic careers.

A rank ordering of characteristics desired in a mentor, highest median and mode to lowest median and mode, of the responses from all the students surveyed at the HSIs appears below. The ranking for all students is presented as there were no differences found in this area between the Hispanic and non-Hispanic response sets.

- | | |
|---|----------------------------|
| 1. Has information that can help me. | 4. Understands my culture. |
| 2. Is easy to find and regularly available. | 5. Is from my culture. |
| 2. Actively reaches out to me with helpful information. | 6. Speaks Spanish. |

This ranking appears to indicate that practical concerns, helpful information, accessibility, and a proactive approach, are the most valued but only the highest ranked characteristic showed limited variation based on median and mode responses. Further analysis was necessary especially given the median and modes found for the two lowest rated characteristics.

Even though most of the students saw value in having relationships with faculty, the Hispanic students were more likely to agree that four of the six characteristics rated were important to them. These were, in descending order by effect size, speaking Spanish (moderately large effect), being from the student's culture (moderately small effect), understanding Hispanic culture (small effect), and being accessible (small effect). While practical concerns, helpful information, accessibility and taking a proactive approach were shown to be highly ranked by all the students attending the HSIs, the last three items in the rank ordering, understands my culture, is from my culture and speaks Spanish, were also more important to many Hispanic students, with small to moderately large effect sizes, than to their non-Hispanic peers.

There were also three statistically significant findings for desired characteristics of mentors and primary language. In each case, there was a positive association between ESL status and higher levels of agreement with the characteristic of the mentor described. The smallest effect size, a small effect, was for "Is from my culture." "Understands my culture" had a moderately small effect size while "Speaks Spanish" had a moderately large effect size. Like above for the Hispanic to non-Hispanic comparison, the ability of a mentor to speak Spanish is the point at which students with EPL and ESL standing have the greatest difference in preference.

Significant findings also occurred in the Hispanic student response set between the EPL and ESL subsets for other questions on the survey. They are included here to illustrate that first language learned appears to have broad impact. A series of questions were asked of students about the value of speaking both English and

Spanish and a second series about audiences with whom they might change their behavior. There was a strongly significant finding with moderate effect for the usefulness of being bilingual when interacting with faculty and staff, with ESL Hispanic students more likely to agree. There was also a significant finding with moderately small effect for students changing their behavior when interacting with faculty and staff of the institution, again with ESL Hispanic students more likely to agree than their Hispanic EPL peers. While being bilingual was seen as an advantage and Hispanic students with self-reported ESL status indicated they changed their behavior to “fit in” with faculty and staff, there is not sufficient additional information to interpret these results. It is not known whether it was Spanish or English proficiency the students had in view when indicating that being bilingual was an advantage and there was no information gathered that would identify the forms of behavior students change to “fit in” with faculty and staff. However, these results indicate that the influence of EPL/ESL standing among Hispanic students attending HSIs extends beyond preferences regarding role models and mentors. While “establishing and maintaining relationships with faculty” and “interacting with faculty and staff” are clearly part of the relational pattern envisioned when students are mentored by representatives of the institution, they are broader statements. They may be an indicator that EPL/ESL status impacts relational preferences and behavioral patterns enacted by Hispanic students at the HSIs they attend.

These results were selected because they include the idea of relating to faculty and staff, the persons most likely to be considered role models and mentors by students at colleges and universities. Yet, they are not questions specific to advising/mentoring. They touch on broader constructs relevant to patterns of relationship and illustrate that the differences in responses between the EPL and ESL groups within the Hispanic students in the sample further highlighting a characteristic of students that may be important for colleges and universities to take into account.

Conclusion

Similar to the research team’s conception of role models and mentors, the study data suggest that there is overlap between these concepts for Hispanic students who attend Hispanic-Serving Institutions. Family members and faculty and staff at the student’s HSI were the top categories for persons seen as role models and formed an upper tier in the data set based on a natural break in the ratings. Providing helpful information, proactively reaching out to the student, and accessibility were three of the most valued characteristics of role models. These were also the top three characteristics desired in a mentor. It appears that among Hispanic students studying at HSIs, helpful information from role models or advisors/mentors, accessibility, and a proactive approach are appreciated. It also appears that appreciation of the impact having a mentor might have on the student’s persistence in college as well as the importance of having a mentor at college increases as students advance along their academic path. This group of findings is similar to Elzubeir and Rizk’s (2001) investigation with graduate students. They found a mentor’s personality and personal characteristics were important to medical students, interns, and residents although their study did not consider whether this increased with years of study.

The 2018 and 2019 survey data also suggests that there is a relationship between cultural identity, primary language, persons seen as role models or mentors, and characteristics desired in a role model or mentor. Having English as a second language had a weak effect on selection of faculty and staff at college as role models. It also had weak to moderate effects on characteristics desired in a role model, specifically understanding Hispanic culture, being Hispanic, and speaking Spanish. The same relationships were observed in respect to advisors/mentors on the 2019 survey. ESL standing was associated at small to moderately large effect sizes with interest in having a mentor that understood Hispanic culture, who was Hispanic, and who spoke Spanish.

Interest in having a role model actively engaged in providing helpful information (moderate effect) and in having an advisor/mentor (weak effect) were positively associate with years of school completed. Students generally agreed, Hispanics and non-Hispanics, that an advisor/mentor with helpful information (median of 10 and mode of 10) and one who reaches out to them with helpful information (median of 8 and mode of 10) was desirable. These are very logical findings that suggests that the value students at HSIs assign to provision of helpful information is high and their sense of the value of proactive engagement with a representative of the institution and the potential for an advisor or mentor to benefit them can increase in relation to the student’s years of experience in college.

Similar to Thevenin, Elliott, and Bigelow (2016), there was a connection, this one with a moderate effect, between STEM interest and having a family member as a role model. For Thevenin, Elliott, and Bigelow this

was found among construction management students while the study described above found a connection for Hispanic students study at HSIs. The relationship may be related to the professions or avocations of students' relatives and given the marked underrepresentation of Hispanics in STEM education and STEM fields, it deserves further investigation. There was also positive association and a weak effect for attending a community college and selecting members of the student's community as role models and a positive association with moderate effect for attending a community college and selecting well-known persons as role models. The authors suggest that there is one or more factors common to students at each of the two types of institutions that precipitated this finding rather than the type of institution attended.

Finally, a cultural divide was found. Hispanic students taking the 2019 survey were found to report lower cultural competence in "my culture" by the institutional representatives providing advising/mentoring, instruction, financial aid assistance, tutoring, assistance with scholarships, career services, and who sponsored student organizations than their non-Hispanic peers, all at highly significant levels with moderately small effect sizes. Since all the respondents attended Hispanic-Serving Institutions, this consistent and broad reported difference in experience related to culture seems incongruous. Yet, it aligns with Garcia's (2019) description of HSIs as occurring with three different orientations, specifically the tier at which the institution's primary focus is on enrolling Hispanic students. Since student success theories regarding minority students have for decades included cultural support and limiting "acculturative stress" (Chun, Marin, Schwartz, Pham & Castro-Olivo, 2016, p. 385), the finding represents a concern. This is especially the case since 65% of the Hispanic students attending college in the United States are at HSIs (Revilla, 2018). While this finding, like all others in the study, must be considered as an initial marker since there are large gaps in the literature regarding Hispanic-Serving Institutions, the students they serve, and the experiences and preferences of those students, it should, at the very least, be disconcerting for employees and leaders of HSIs.

Recommendations

The research results described are from an exploratory study in areas in which little to no investigation has taken place. As this is the case, the findings require additional empirical verification. However, the results reported appear to shed light on several logical patterns. Among Hispanic students attending HSIs, cultural identity and primary language impact student preferences and actions. Since analysis indicated that this occurred with weak to moderate effects in respect to role models and advisors/mentors, colleges and universities should consider using cultural identity and/or ESL status as a means of sorting advising/mentoring assignments.

It is important to note that the majority of Hispanic students, just like their non-Hispanic peers, selected practical matters like reaching out to the student, providing helpful information, and accessibility as the most important characteristics of role models and advisors/mentors. However, Hispanic cultural identity and ESL status were shown to impact other preferences regarding advisors/mentors. Planning institutional services and programming in a manner that emphasizes these characteristics would be advisable as advocated by Baker (2015).

The research findings confirm that enculturation within and relationships established with individuals representing the institution are understood by Hispanic students attending HSIs to be important. These are patterns emphasized in various college student success models. Individuals responsible for planning or implementing programs that engage students should take these theories, especially those specific to Hispanic students like Castellanos and Gloria's (2007) Psychosociocultural Model of College Success for Latinx students or Santiago, Taylor and Calderón's (2013) list of institutional characteristics that can increase the success of Hispanic students studying STEM, into account.

Student success theories, like those just listed, emphasize the value of limiting clashes of culture while Chun, Marin, Schwartz, Pham and Castro-Olivo found in a study published in 2016 that for Latina students "cultural factors, including low acculturative stress and strong ethnic identity, had significant positive effects on emotional wellbeing and GPA" (p. 385). Yet, the Hispanic students completing the 2019 survey, all of whom were attending college in north Texas, reported encountering cultural challenges at their HSIs at significantly higher levels than their non-Hispanic peers. This was reported for all the forms of engagement listed on the survey. While this is the first time, to the best of the authors' knowledge, a finding of this type has been reported for HSIs, it should serve as a call for reflection on the part of all faculty, staff, and administrators at Hispanic-Serving Institutions and for further research in this important topic area.

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References

- Alarcón, J., & Bettez, S. (2017). Feeling brown in the academy: decolonizing mentoring through a disidentification Muxerista approach. *Equity & Excellence in Education, 50*(1), 25-40.
- Astin, A. (1993). What matters in college? Four critical years revisited. San Francisco, CA: Jossey-Bass.
- Baker, V. (2015). People strategy in human resources: lessons for mentoring in higher education. *Mentoring & Tutoring: Partnership in Learning, 23*(1), 6-18.
- Castellanos, J., & Gloria, A. (2007). Research considerations and theoretical application for best practices in higher education: latina/os achieving success. *Journal of Hispanic Higher Education, 6*(4), 378-396.
- Crooks, N. (2013). Mentoring as the key to minority success in nursing education. *The ABNF Journal: Official Journal of the Association of Black Nursing Faculty in Higher Education, Inc, 24*(2), 47-50.
- Edwards, T. M., Smith, B. K., Watts, D. L., Germain-Aubrey, C. C., Roark, A. M., Bybee, S. M., Cox, C. E., Hamlin, H. J., & Guillette, L. J. (2011). Group-Advantaged Training of Research (GATOR): a metamorphosis of mentorship. *Bioscience, 61*(4), 301-311.
- Ehrich, L., Hansford, B., & Tennent, L. (2004). Formal mentoring programs in education and other professions: a review of the literature. *Educational Administration Quarterly, 40*(4), 518-540.
- Elliott, J. (2018). Can a campus-wide faculty mentorship program improve student success? *College and University, 93*(2), 39-42.
- Elzubeir, M., & Rizk, D. (2001). Identifying characteristics that students, interns and residents look for in their role models. *Medical Education, 35*(3), 272-277.
- Field, A. (2013). *Discovering statistics using IBM SPSS statistics*. Thousand Oaks, CA: Sage Publications.
- Fleck, C., & Mullins, M. (2012). Evaluating a psychology graduate student peer mentoring program. *Mentoring & Tutoring: Partnership in Learning, 20*(2), 271-290.
- Garcia, G. A. (2019). *Becoming Hispanic-Serving Institutions: opportunities for colleges and universities*. Baltimore, MD: Johns Hopkins University Press.
- Gartland, C. (2015). Student ambassadors: 'role-models', learning practices and identities. *British Journal of Sociology of Education, 36*(8), 1192-1211.
- Johnson, I. (2014). Female faculty role models and student outcomes: a caveat about aggregation. *Research in Higher Education, 55*(7), 686-709.
- Johnson, I. (2017). Female faculty role models, self-efficacy and student achievement. *College Student Journal, 51*(1), 151-172.
- Kalpazidou-Schmidt, E., & Faber, S. (2016). Benefits of peer mentoring to mentors, female mentees and higher education institutions. *Mentoring & Tutoring: Partnership in Learning, 24*(2), 137-157.
- Kolb, S. M. (2012). Grounded theory and the constant comparative method: valid research strategies for educators. *Journal of Emerging Trends in Educational Research and Policy Studies, 3*(1), 83-86.
- Laerd Statistics. (2108). Chi-Square test for association using SPSS software. Retrieved from <https://statistics.laerd.com/spss-tutorials/chi-square-test-for-association-using-spss-statistics.php>
- Laerd Statistics. (2108). Spearman's rank-order correlation. Retrieved from <https://statistics.laerd.com/statistical-guides/spearmans-rank-order-correlation-statistical-guide-2.php>
- Luedke, C. (2017). Person first, student second: staff and administrators of color supporting students of color authentically in higher education. *Journal of College Student Development, 58*(1), 37-52.
- Mazerolle, S., Nottingham, S., & Coleman, K. (2018). Faculty mentorship in higher education: the value of institutional and professional mentors. *Athletic Training Education Journal, 13*(3), 259-267.
- McLeod, S.A. (2019, May 17). *Z-score: definition, calculation and interpretation*. *Simply Psychology*. Retrieved from <https://www.simplypsychology.org/z-score.html>
- Mondisa, J. (2015). Increasing diversity in higher education by examining African-American STEM mentors' mentoring approaches. Proceedings from 2015: *2015 International Conference on Interactive Collaborative Learning (ICL)*, 321-326.
- National Center for Educational Statistics. (n.d.). Fast facts: race, ethnicity of college faculty. Retrieved from <https://nces.ed.gov/FastFacts/display.asp?id=61>

- National Science Foundation. (2017). Award abstract # 1764268 – HSI conference: stakeholder perspectives on challenges and opportunities for improving undergraduate STEM education at HSIs. Retrieved from https://www.nsf.gov/awardsearch/showAward?AWD_ID=1764268
- Parent, M., & Oliver, J. (2015). Mentoring the earliest-career psychologists: role models, knowledge of internship issues, and attitudes toward research and science. *Professional Psychology-Research and Practice, 46*(1), 55-61.
- Pascarella, E. T. & Terenzini, P. T. (1980). Predicting freshman persistence and voluntary dropout decisions from a theoretical model. *The Journal of Higher Education, 51*(1), 60-75.
- Preuss, M. D., Rodin, J. C., Sosa, E. M., Ramos, J. D., Dorsett, C. R. & Burlison, C. R. (2019). *Describing Hispanic-Serving Institutions in the south-central United States: a report for Los Barrios de Amarillo*. Canyon, TX: West Texas Office of Evaluation and Research.
- Reeves, M., Throne, R., Bradley, J., & Piferi, R. (2015). *Glass ceiling effect: a qualitative study of higher education women administrators and mentorship* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses.
- Revilla, N. J. (May 31, 2018). Number of Hispanic-Serving Institutions in the U.S. increases to 492. Retrieved from <https://www.hacu.net/NewsBot/NewsBot.asp?MODE=VIEW&ID=2920>
- Santiago, D. A., Taylor, M., & Calderon, E. (2015). *Finding your workforce: Latinos in science, technology, engineering, and math (STEM): linking college completion with US workforce needs: 2012–13*. Washington, DC: Excelencia in Education.
- Scase, M., & Turnbull, B. (2013). Role models in gender-skewed disciplines. *Engineering Education, 8*(1), 98-110.
- Shortell, T. (2001). An introduction to data analysis and presentation. Retrieved from <http://www.shortell.org/book/chap18.html>
- Strothers, A., Justice, B., & Lugg, C.A. (2017). *Making mentoring matter: the 'Proctor Process' of faculty mentoring in higher education* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses.
- Terenzini, P. T. & Pascarella, E. T. (1991). Twenty years of research on college students: lessons for future research. *Research in Higher Education, 32*(1), 83-92.
- Terrion, J., & Leonard, D. (2007). A taxonomy of the characteristics of student peer mentors in higher education: findings from a literature review. *Mentoring & Tutoring: Partnership in Learning, 15*(2), 149-164.
- Thevenin, M., Elliott, J., & Bigelow, B. (2016). Mentors, role models, and observed differences in students' construction education self-efficacy and motivation. *International Journal of Construction Education and Research, 12*(3), 162-178.
- Tinto, V. (1993). *Leaving college: rethinking the causes and cures of student attrition*. Chicago: The University of Chicago Press.
- Upcraft, M. L., Gardner, J. N., & Barefoot, B. O. (Eds.). (2005). *Challenging and supporting the first-year student: A handbook for improving the first year of college*. San Francisco, CA: Jossey-Bass.
- Walters, K., Simoni, L., Evans-Campbell, J., Udell, M., Johnson-Jennings, T., Pearson, C. R., McDonald, M M., & Duran, B. (2016). Mentoring the mentors of underrepresented racial/ethnic minorities who are conducting HIV research: beyond cultural competency. *AIDS and Behavior, 20*(Supplement 2), 288-293.
- Welfare, L., Sackett, C., & Moorefield-Lang, H. (2011). Student-faculty collaborative research: a qualitative study of experiences with the authorship determination process. *Mentoring & Tutoring: Partnership in Learning, 19*(2), 179-198.
- Wyre, D., Gaudet, C., & McNeese, M. (2016). So you want to be a mentor? An analysis of mentor competencies. *Mentoring & Tutoring: Partnership in Learning, 24*(1), 73-88.
- Zambrana, R., Ray, R., Espino, M., Castro, C., Douthirt C.B., & Eliason, J. (2015). “Don’t leave us behind:” the importance of mentoring for underrepresented minority faculty. *American Educational Research Journal, 52*(1), 40-72.

Stakeholders` Perception and Attitude Based Framework for Developing Responsible Management Education (RME) Program

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Abstract: This paper is attempted to contribute in the effort to foster business postgraduate students' development towards becoming responsible business leaders. Specifically, this paper is seeking, in Sudan, to examine the state of responsible management education in business postgraduate programs, examine the perception and attitude towards responsible management and responsible management education among MBA and DBA students, and construct a comprehensive framework appropriate for developing responsible management education program in under- developing countries. The data for this study had been gathered through a structured questionnaire. In total, 106 postgraduate business students answered the survey from the largest four business schools or faculties in Sudan. The students are distributed among management, finance and marketing specializations. It is worth mentioning that none of the schools covered is a signatory to the principles of responsible management education developed by UN Global Compact. The students exhibited positive CSR perception and attitude, with a heightened focus on acting ethically and a diminished focus on financial considerations. One of the key lessons learned from this study is the need for continued evolution and development of CSR and ethics more generally across business schools' curriculums in Sudan. The students are seeking the knowledge, skills, exposure and experience they need through responsible management education to be as effective as possible in the real world. Hence, business schools can foster the capabilities of students to be future generators of sustainable value for business and society at large. To that end, this paper proposed a co-created and shared value framework conceptualized to develop and implement an effective responsible management education program in business postgraduate programs.

Keywords: Responsible management education, Sustainability, Corporate social responsibility, Business ethics, Business schools, Perception, Attitude, Sudan

Introduction

The business and education world are changing rapidly in response to the needs of the various stakeholders. Companies are facing new challenges and risks due to the increase in the level of awareness among those stakeholders regarding the issues of sustainability and corporates social responsibility (CSR). Indeed, stakeholders are less and less tolerant if companies continue to focus only on profit-maximization while neglecting their expected contribution to society and the environment. Companies` future leaders (MBA and DBA students) are, in turn, expected to realize and appreciate the new challenges and risks facing business organizations. In fact, business and management schools play a key role in shaping the skills and mindsets of future business leaders, and can be powerful drivers of sustainability and CSR. An increasing number of businesses and non-business organizations are engaged in demonstrating that they are being good to the world, socially and environmentally. Up to 2018 worldwide 13,420 large organizations expressed their readiness to be part of this trend. Of these organizations, 7813 are active across 160 countries in 2018. 18 of them organizations are in Sudan.

Recognizing the vital role of education in achieving the SDGs, the UN in 2007 during the UN Global Compact Leaders' Summit in Geneva, launched the Principles for Responsible Management Education (PRME). The

PRME initiative has become the largest organized relationship between the United Nations and business schools. The mission of PRME is to transform business and management education, research and thought leadership globally, while promoting awareness about the SDGs and developing the responsible business leaders of tomorrow. The PRME are categorized as: purpose, values, methods, research, partnership and dialogue. By the end of 2018, the initiative counts over 745 business and management-related higher education institutions across 85 countries. PRME is governed, alongside the UN Global Compact, by a Steering Committee comprised of the major accreditation bodies, specialized and regional associations. PRME works with UN Global Compact participants to help advance the SDGs in academia, and connects responsible businesses with higher education institutions to help recruit talent with sustainability mindsets, skills and capabilities. Recognizing the pressure from the community, on August 2019, the US Business Roundtable announced the release of a new statement on the purpose of a corporation signed by 181 CEOs of the largest business corporations in US. The CEOs committed to lead their companies for the benefit of all stakeholders – customers, employees, suppliers, communities and shareholders. The CEOs committed themselves to: delivering value to customers, investing in employees, dealing fairly and ethically with suppliers, supporting the communities and generating long-term value for shareholders. The new statement supersedes previous statements and outlines a modern standard for corporate responsibility.

Research Problem

It is evident that business schools cannot just take a spectator’s role towards sustainable corporate responsibility but have to thoroughly prepare their students to take over responsible leadership as soon as they enter the business world. Due to the rotating circle of economic crises, universities – and especially business schools – have come under pressure to reconsider their concepts of management education. Goshal, (2005) and Navarro (2008) argue that business schools do more harm than good and that they ignore the human dimension of businesses and their responsibility towards the social and ecological environment . Business school graduates are regularly characterized as cold-blooded technocrats lacking interpersonal skills, intercultural abilities, emotional and ecological intelligence, trustworthiness or social responsibility (Mintzberg, 2004). With regard to Sudan, despite the huge natural resources available to Sudan, Figure 1 and due to irresponsible and mismanagement of these resources , indicators reveal that Sudan is far behind many counties with regard to the sustainability development goals (SDGs), Figure 2 which , in turn, reflect the living conditions and quality of life in the country.

Particulars	Amount
Population	44 Million
Gum Arabic	80% of the world production in Sudan
Ground nuts	40% of the world production in Sudan
Agricultural land available	228 Million acres
Forest	54 Million acres
Water	50 Billion cubic meters annually
Livestock	102 Million (fed from natural grass)
Copper	150 Million tones
Gold	140 Tones annually
Oil	115 thousand barrels daily

Figure 1. Sudan National Resources

Particulars	Sustainability Development Indicators*
Poverty	47% Of Population Lives Below Poverty Line, Jumps To 58% Outside Urban Areas
Education	According To UNICEF Nearly 3 Million Children Between The Age Of 5 And 13 Are Kept Out Of , One Of The Highest Rate In The World.
Food & Hunger	In 2019 6.3. Million Suffered From Food Insecurity, Around 40% Of The Population Are Malnourished. 87% Of Women Ages Of 15 And 49 Have Been Forced To Female Genital Mutilation (FGM).
Global Peace Ranking 2018	153 / 180 (Longest Deadliest Civil Wars In the World, 2.35 Million People Displaced).
Crude Death Rate	7.44%

Figure 2. Sudan Socio-economic Indicators

(Sources: <https://countryeconomy.com>, <https://sedac.ciesin.columbia.edu/data/collection/epi>, <https://www.transparency.org/cpi2018>)

Can RME helps in hindering such deterioration in Sudanese quality of life and, in turn, contribute in fostering the achievement of the SDGs in this country? The answer to such a question requires an in-depth research and studies in Sudan and in other countries in the world covering various types of stakeholders particularly business postgraduate students. Understanding the MBA and DBA students` perception and attitude towards responsible management and CSR aspects and issues would help constructing appropriate approaches and frameworks for developing effective RME programs that fit and align with the concerned stakeholders needs and expectations.

Aim of the Study

This paper is attempted to contribute in the effort to foster business postgraduate students` development towards becoming responsible business leaders. Specifically, this paper is seeking to:

- Examine the state of RME in business postgraduate programs in Sudan.
- Examine the perception and attitude towards responsible management (RM) and RME among MBA and DBA students in Sudan.
- Construct a comprehensive framework appropriate for developing RME program in developing and under- developing countries.

The study focuses on business postgraduate students as main stakeholders because their expectations and desires are the most important aspects to be considered in designing or developing RME curriculum or programs. As such, if we were to conduct stakeholders analysis and mapping of business schools, students would receive high priority because they possess, to a greater or lesser extent, the three characteristics that validate their role as major stakeholders, namely, legitimacy, urgency and power ,Mitchell et al.(1997).

Albaum and Peterson (2006) also argued that students, especially business students who collectively constitute the future leadership of corporations, should be highly prioritized as a stakeholders group. By studying the ethics attitude of present business students, it may be possible to predict the future ethical behavior of business leaders and perhaps even influence that behavior through appropriate responsible business education. As students are major stakeholders of business schools, it is essential to capture their attitude and perspectives on RM, RME, sustainability and CSR to understand their views on their education in these areas and what changes they would like to see in their business education to be more responsible.

Literature Review: Previous Studies

Macquarie Graduate School of Management (MGSM) Studies

MGSM conducted 3 surveys during the current decade to examine the state of PRME. The surveys were conducted in 2011, 2013 and 2016 with the support of PRME signatory schools. The purpose of the PRME survey was to examine responsible management attitude amongst postgraduate students enrolled in business and management programs. The studies involved students from around the world (North America, South America, Europe, Asia and Australia) but not the Middle East or African countries. These surveys will be referred to, in this paper, as (the worldwide studies).

There are several major findings of these studies. In 2011 study, the respondents demonstrated strong social values and showed a commitment to the community through their volunteer work and donation of money. Students exhibited positive CSR attitude and, in contrast to Carroll's (1991) pyramid, indicated that ethical, rather than financial considerations, are the primary responsibilities of a business. When asked about RME, the students reported that their school is preparing them well on issues of business ethics and social responsibility, and that they feel well equipped to apply RME knowledge in real life. In addition, it is found that in a number of areas, responses varied significantly by gender and type/stage of program.

The results of the 2013 study on RME provide some key recommendations for the future. It is suggested that academic institutions offering postgraduate business programs would be well served by maintaining and increasing the scope of RME in their curricula. This will require the involvement of a number of key groups: business schools, business sector, students and third party initiatives (e.g. PRME). The studies proposed specific role to be played by each group to foster the development of RME.

2016 study provide further insights which call for a shift towards human- and planet- centered paradigm of management. This would require new competencies. It would also require a pedagogy that exposes students to the tensions between business and society so that students are better prepared to make judgments in complex situations. The competencies should help future leaders to act with responsibility towards human and planet. That is covering the CSR and sustainability aspects (i.e. economic, social, environment and governance). The study emphasized that school need to reconsider changing the way the courses are delivered by applying more practical strategies. Students learning needs to occur within complex learning environments to provide active problem-based and self-directed acquisition of knowledge, skills and attitude. Professors are to be encouraged to introduce more applicable case studies in classes and experiential and field learning. In addition, 2016 study encourages faculty members to emphasize more active—rather than passive—learning. They could tap into the experiences of students on live projects or simulations to bring home the interdependence between business and society and illustrate the complexities of responsible decision-making.

Approaches and Frameworks to Develop RME

Didactic Model for Responsible Management Education

This study provides recommendations about how to foster students’ development towards becoming long-term thinking, responsible business leaders. Referring to the PRME, the following five -element model is suggested to realize responsible management education (see Figure 3).

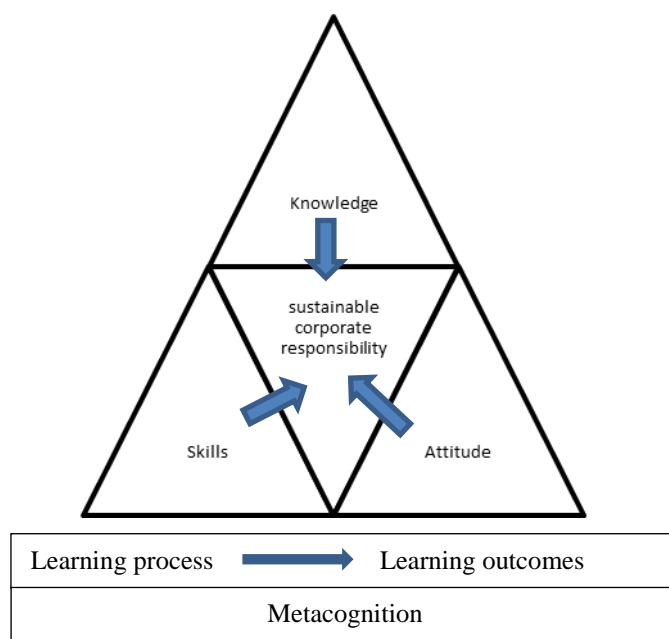


Figure 3. Didactic Model for Responsible Management Education

Wilson, Lenssen and Hind Study (2006) Framework

This study identifies the knowledge, skills and attitude as generic competencies need to be covered by business leaning program to enhance sustainable corporate responsibility.

Other Studies

Several studies were conducted to examine the question of social responsibility education and its components, especially ethics. Porter and Kramer (2011) suggested a new paradigm for the relationship between the business sector and society. To address social problems, the authors suggested moving from CSR to creating shared value (CSV), which are about businesses acting as businesses (based on their competitive advantage and resources) and not as charities. In this case, financial value and social value can be created simultaneously. As CSR and

CSV gain importance, it follows that the RME of future business leaders is essential for the effective performance of business graduates in the rapidly changing business world. Business schools have a responsibility to provide current and future practitioners with training in the basics of ethics, which would ideally act as a catalyst to stimulate socially and ethically managed business organizations, Cornelius et al., (2008).

Brown (2009) suggested business schools need to acknowledge their role in integrating CSR throughout the entire curriculum to allow students to understand its complexity and to highlight the interconnection between the different business aspects. Baruch (1996) argue that CSR and ethics need continually be adapted in both content and structure of the RME program to meet the needs of the business world, as well as address the view of the students and lecturers. Rizvi (2009) mentioned that the learning environment provided by the academic institutions and educators must adapt to new ways of thinking about social and political conditions. Leveson (2014) argued that in preparing the curriculum it is important to investigate generational values, as allowing our knowledge base to be built on the values and perception of previous generations can be misleading to current generations. Leveson (2014) added that as with any learning environment it is imperative that the curriculum acknowledges and incorporates students' views and opinions, in an effort to create an authentic learning experience with relevance and meaning. Leveson (2014) also emphasized that at the classroom level understanding and appreciating students' CSR views and attitude will improve the facilitator's ability to frame the delivery in ways that the students can relate to and engage with. Leveson's view is in line with Cotton's (2006) who stated that and beyond the students there is also a need for the curriculum to also bear in mind the facilitators beliefs to ensure it is implemented in its intended format.

Leveson (2014) argued that in addition to the generational perspective to the different approach to CSR, there is also a cultural dimension which needs to be taken into account. He mentioned, as examples that in most European countries employees, environment and service are the most important aspects of CSR reporting, while in Australia it is product quality, management and financial performance, and in the USA it is employee relations (diversity), financial performance and philanthropy are the most important aspects. In this regard there are ongoing challenges to be met and significant effort required to truly integrate CSR into the business school curricula. According to Bishop (1992), it is likely this there will be an area of continued focus for most business schools in the next decade. However, there is no one size fits all solution and the learning environment needs to be authentic and support the attainment of knowledge and experience that can be applied to real life situations (Herrington, (2010)). It is imperative that both the educators and curriculum encourage an authentic learning approach to best engage students utilizing real-world case studies and situations faced as future business leaders (Herrington, (2010)). The notion that knowledge and skills are best learnt in contexts to be useful in real life (Collins, 1991) further supports the need to integrate components of CSR and ethics in all business subject. By utilizing authentic tasks likely to be faced by the students, the curriculum has an influence that beyond the classroom allows the students to become emotional stakeholders in addressing real-world problems (Rule, 2006).

To conclude, the literature reviewed above indicates that there is a lack of studies assessing perspectives and attitude towards responsible management of a very important stakeholder group (i.e. business management students). The few studies that have focused on this group have yielded mixed results with some showing students are indifferent to responsible management, while others, especially women, demonstrate a growing interest in CSR. As well, there is a shortage of comprehensive frameworks to be adopted to design and implement an appropriate RME program which take the surrounding environment into consideration. In other parts of the world, emerging and developing, the picture can be completely different. To the best of our knowledge, The PRME surveys, so far conducted, not covered any of the African or Middle East Countries and, as well, not included non PRME -signatory business schools.

Methodology

The Approach

The research problem will be addressed as a socio-economic educational problem which affects multiple stakeholders with different needs and expectations. Accordingly, the RME program will be looked at as a process in which social and economic values are co-created in a win – win fashion. That is equally considering business, society and the environment aspect when conducting business activities. Hence, economic and social value can be created simultaneously. To that end, the approach adopted in this study will mainly employ

concepts, tools and methods developed in the fields of education, CSR, sustainability, and stakeholders analysis for gathering data, analysis, interpretation of results and conclusion drawing.

The Conceptual Framework

The conceptual framework is constructed around students' attitude towards CSR & sustainability, Figure 4.

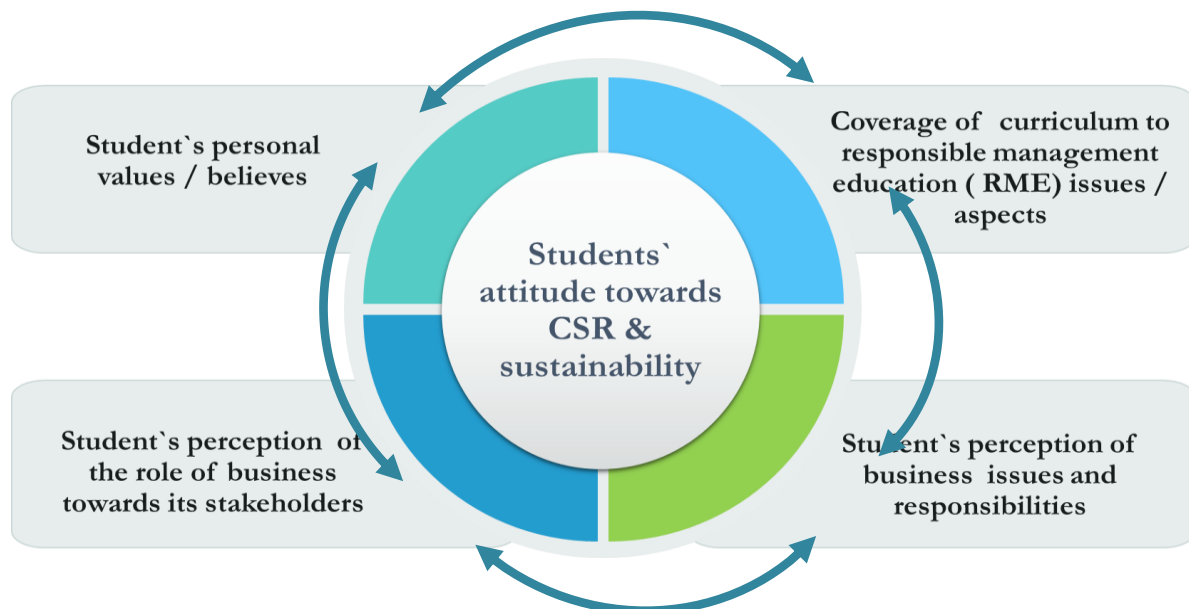


Figure 4. The Conceptual Framework

Data Collection

The data for this study had been gathered through a structured questionnaire. The questionnaire largely borrowed from the questionnaire designed for the second study conducted by MGSM in 2013 to examine the attitude of MBA students around the world towards RM and RME. The survey took about 20 minutes to answer, and included 90 items that were grouped into 8 main constructs as follows:

- background questions (university, school / faculty, program, specialization, stage of study, gender, working status), 7 items;
- knowledge of UN Global Compact and PRME, 2 items;
- values and lifestyles, 9 items;
- RME curriculum, 38 items;
- attitude towards business issues, 9 items;
- attitude towards business responsibilities, 9 items;
- attitude towards business stakeholders, 9 items and
- attitude towards CSR and sustainability, 7 items.

In addition, the grouping of the items in the questionnaire is intended to help achieving the main aims of the study. All items, except for student background, were in Likert-scale format using a five-point response scale. Data were collected manually and were analyzed using SPSS. The collected data were analyzed both qualitatively and quantitatively in order to comprehensively assess students' responses.

Participants

In total, 106 postgraduate business students answered the survey. The respondents were distributed among the largest four business schools or faculties: El-Nielin University, Gezira University, Khartoum University and Sudan University for Science and Technology. 65% of the participants are MBA program students. 35% are

DBA program students. The students are distributed among management, finance and marketing specializations. The females represent 63% and males 37%. It worth mentioning that none of the schools covered is a signatory to the PRME.

Results and Discussion

The State of RME in Sudan

Offered Responsible Management Education (RME)

The survey asked participants about their current RME: what does their schools offer them and how well prepared do they feel in these areas? Figures 3 shows whether the business schools and departments offered their students particular responsible management units as “core units”, “electives”, “part of another unit”, “not at all” or if the student “did not know”. Table 1 shows that the most common core units in RME were on consumer and marketing (66.3%), followed by ethical decision making (25%) and business ethics (24.5%). On the other hand, environment sustainability (8.7%), followed by conflict resolutions (8.8%) were those least taught as core units. This study shows that the most common elective was stakeholders management (8.6%) followed by environment sustainability (7.7%). 14.4% and 13.7% of the students, respectively, indicated that ethical decision making and business ethics were not at all taught in their business school, and only 8.7% indicated so for CSR.

Table 1. Responsible Management Units Offered

Management issues covered by the program	Please indicate how the following management issues are covered by the curriculum					total
	core units	electives	part of another unit	not at all	did not know	
Business ethics	24.5	2.0	52.9	13.7	6.9	100.0
Corporate Social Responsibility(CSR)	9.6	3.8	69.2	8.7	8.7	100.0
Ethical decision making	25.0	5.8	50.0	14.4	4.8	100.0
Legal aspects of management	21	3.8	48.6	20	6.6	100.0
Environmental sustainability	8.7	7.7	39.4	26.9	17.3	100.0
Consuming and marketing	66.3	2.9	23.1	5.8	1.9	100.0
Stakeholder management	15.2	8.6	53.3	14.3	8.6	100.0
Conflict resolution	8.8	4.9	51.0	16.7	18.6	100.0
Social entrepreneurship	13.6	6.8	41.7	24.3	13.6	100.0
Diversity management	15.5	6.8	49.5	20.4	7.8	100.0
Fair trade	12.7	3.9	36.3	27.5	19.6	100.0
Green Economy	17.3	4.8	26.9	29.8	21.2	100.0
Human Rights	14.3	3.8	36.2	36.2	9.5	100.0

Students Perception How Equipped to Apply Knowledge on Real Life

The students were then asked how well equipped they felt to apply the knowledge acquired in these subjects in real life, Table 2 shows that (55.8%) felt very well equip with “consumer and marking”, (40.8%) with “ethical decision making” and (41.3%) with “business ethics”. On the other hand, (36.5%) felt not equipped with regard to “corporate social responsibility”, “conflict resolution” (32.4%) and “business ethics” (30.8%).

Change required in the Curriculum towards RME

We asked the students how their school or department could most effectively change the curriculum towards RME. 15 optional changes were proposed. Table 3 shows the levels of agreement to each of the proposed changes towards RME. The statements that, “Encourage professors to introduce more applicable case studies in classes”, “Provide students with internships related to corporate responsibility / sustainability”, “Experiential and field learning and “Bring in experts and leaders as guests speakers on these topics” gained the highest level of agreement (strongly agree and agree) with (97.1%) , (96%) and (93.3%), respectively. 7.9% of respondents thought that no changes were required.

Table 2. Students Perception How Equipped to Apply Knowledge on Real Life

Business aspects	Please indicate how well the program equipped you apply the following business aspects in real life					total
	very well equipped	well equipped	satisfactory equipped	not equipped	do not know	
Business ethics	41.3	13.5	1.9	30.8	12.5	100.0
Corporate Social Responsibility(CSR)	23.1	28.8	1.9	36.5	9.6	100.0
Ethical decision making	40.8	22.3	1.0	23.3	12.6	100.0
Legal aspects of management	27.3	22.2	2.0	24.2	24.2	100.0
Environmental sustainability	13.9	28.7		29.7	27.7	100.0
Consuming and marketing	55.8	26.0		12.5	5.8	100.0
Stakeholder management	29.3	27.3	1.0	29.3	13.1	100.0
Conflict resolution	16.7	19.6	1.0	32.4	30.4	100.0
Social entrepreneurship	16.7	22.5	1	28.4	31.4	100.0
Diversity management	26.2	26.2	1.0	24.3	22.3	100.0
Fair trade	14.7	21.6	1.0	23.5	39.2	100.0
Green Economy	13.1	20.2	1.0	22.2	43.4	100.0
Human Rights	22.3	15.5	1.0	26.2	35.0	100.0

Table 3. Suggested Changes Needed in the Curriculum

Suggested change in the curriculum	Please indicate which changes you think needed in the curriculum					total
	strongly agree	agree	do not know	disagree	strongly disagree	
Encourage critical thinking and analysis in the classroom	49.5	38.6	4	5.9	2	100
Bring in experts and leaders as guest speakers on these topics	60.6	32.7	2.9	2.9	1.0	100
Encourage professors to introduce more applicable case studies in classes	73.8	23.3	1	1.9		100
Experiential learning and field learning	66.3	29.7	3.0	1.0		100
Integrate social and environmental themes into the core curriculum	44.7	49.5	4.9	1		100
Provide students with internships related to corporate responsibility / sustainability	52.4	44.7	1	1.9		100
Create a concentration on sustainability and CSR	36.9	55.3	6.8	1.0		100
Educate recruiters on the importance of these themes in the curriculum	37.0	44.0	17.0	2.0		100
Increase the number of electives that focus on social and environmental themes	27.9	48.1	10.6	11.5	1.9	100
Increase the number of core units that focus on social and environmental themes	32.7	47.1	4.8	13.5	1.9	100
Change the timing of these units/course towards the end of the degree	14.9	39.6	14.9	30.7		100
No changes are required	7.9	6.9	8.9	36.6	39.6	100

Students Attitude towards RM, RME, CSR and Sustainability

Students Perception towards Values and Believes

Table 4 demonstrates that the most important (i.e. marked as ‘Absolutely essential’ and ‘Very important’) values or believes for the business students is “being successful in your studies or work”. This value scored (98.1%) . “Living according to religious faith” (97.1%) marked second. On the other hand, “Making a lot of money” and “Helping the community and people in need” are both ranked last in (10.6%).

Table 4. The Importance of Values / Believes

Values / believes	Please indicate how the following values / believes are important to you					total
	absolutely essential	very important	fairly important	not very important	not at all important	
Making a lot of money	10.6	24.0	51.9	6.7	6.7	100.0
Helping the community and people in need	10.6	24.0	51.9	6.7	6.7	100.0
Being successful in your studies or work	81.0	17.1	1.0	1.0		100.0
Making the world a better place	46.2	34.6	15.4	2.9	1.0	100.0
Living a happy and comfortable life	59.6	29.8	10.6			100.0
Being able to do what you want	66.7	29.5	1.9	1.9		100.0
Living according to religious faith	80.0	17.1	2.9			100.0
Living according to your values	59.4	28.7	8.9	1.0	2.0	100.0
Having a good work–life balance	49.5	35.9	11.7	1.9	1.0	100.0

Students Perception and Attitude towards Business Issues

The students were asked: “If you were in a position of power in a business organization how important would the following issues be for you? Students were given a list of 11 items and were asked to rate them from 1 (Not at all important) to 5 (Very important). Table 5 shows how the students ranked each item according to its level of perceived importance. (92.2%) of the students agreed that “Consumer satisfaction” should be the most important issue for business leaders, “Treating employees fairly and ethically” ranked second with (85.4%) and, “local and national peace and reduction of violence” (76.5%) ranking third. On the other hand, “The economy and financial markets” (59.4%), CSR practices such as “Employer-supported volunteering and giving” (42.2%) and “Engaging with various stakeholders” (37.9%) are ranked, respectively, as least important business issues to the leader in business organization.

Table 5. Importance of Business Issues

Business issues	If you were in a position of power in a business organization, how important would the following business issues to be for you?					total
	very important	important	somewhat important	of very little important	not at all important	
Consumer satisfaction	92.2		4.9	1.9	1.0	100.0
Treating employees fairly and ethically	85.4		12.6	1.0	1.0	100.0
The economy and financial markets	59.4		34.7	5.0	1.0	100.0
Making a profit for shareholders	52.0	35.3	9.8	2.0	1.0	100.0
Trading fairly with suppliers	47.6	46.6	1.9	1.0	2.9	100.0
Engaging with various stakeholders	37.9	37.9	19.4	2.9	1.9	100.0
Developing the community we operate within	57.4	32.7	6.9	1.0	2.0	100.0
Local and national peace and the reduction of violence	76.5	14.7	5.9	1.0	2.0	100.0
Environmental concerns and climate change	54.9	33.3	9.8	1.0	1.0	100.0
Employer-supported volunteering and giving	42.2	29.4	20.6	6.9	1.0	100.0
Philanthropy and donating to Charity	53.5	24.8	16.8	5.0		100.0

Students Perception and Attitude towards Stakeholders

For their opinions regarding the importance of stakeholders to the business, students were asked to answer how important each of the following stakeholders to them (from 1 'Not at all important' to 5 'Absolutely essential'): "customers", "employees", "shareholders", "suppliers", "environment", "government", "employee's family", "community" and "trade unions". Table 6 ranked "Customers" are the most important stakeholders to them with (81.9%), second "employees", (79%), third "shareholders" (60%). On the other hand, the least important respectively, were "employee's family", (25.7%), "trade union" (32.4%) and "government" (35%).

Table 6. Importance of Stakeholders

Stakeholders	Please indicate how the following stakeholders are important for a business company					
	absolutely essential	very important	fairly important	not very important	not at all important	total
Consumers	81.9	16.2	1.9			100.0
Employees	79.0	16.2	4.8			100.0
Shareholders	60.0	27.6	12.4			100.0
Suppliers	45.7	46.7	7.6			100.0
The environment	52.0	33.3	14.7			100.0
Governments	35.0	40.8	17.5	6.8		100.0
Employees' families	25.7	31.4	35.2	6.7	1.0	100.0
Members of the general community	34.6	41.3	20.2	3.8		100.0
Trade Unions	32.4	37.1	27.6	1.9	1.0	100.0

Students Perception and Attitude towards Business Responsibility

For their opinions regarding the degree of importance of responsibilities to the business, students were asked to answer how important each of the following types of responsibilities to them (from 1 'Not at all important' to 5 'Absolutely essential'): "ethical", "legal", "financial", "social", "environmental", "philanthropic". Table 7 shows how students ranked these responsibilities. "Ethical" responsibility was ranked as absolutely essential responsibility to students (73.1%), "Financial" second (61.5%) and "legal" third (59.6%). On the other hand, the least important type of responsibilities were, respectively, "philanthropic" (39.4%), "Social" (42.7%) and "environmental" (52.9%).

Table 7. Students Ranking of Business Responsibility

Responsibility	Please indicate how important the following responsibility for a business company					
	absolutely essential	very important	fairly important	not very important	not at all important	total
Ethical	73.1	23.1	1.9		1.9	100
Legal	59.6	39.4	1.0			100
Financial	61.5	32.7	5.8			100
Social	42.7	39.8	16.5		1.0	100
Environmental	52.9	29.8	14.4	1.0	1.9	100
Philanthropic	39.4	28.8	25.0	5.8	1.0	100

Students Perception and Attitude towards CSR and Sustainability

To know the attitude towards CSR and sustainability, the students were asked to state their level of agreement with seven statements on social responsibility, both positive and negative, from 1 (Strongly disagree) to 5 (Strongly agree). Table 8 shows the percentages of agreement. The students agreed most on the "good ethics is often good business" (66%) and second, "companies should do a lot more for society and the environment" (48.5%). In other words, they agreed that being good can help one do well and that it is also the right thing to do. They strongly disagreed that "The most important concern for a firm is making a profit, even if it means bending or breaking the rules" (44.7%).

Table 8. Students Perception and Attitude towards CSR and Sustainability

CSR attributes	Please indicate how do you agree (disagree) with the following statement about CSR and sustainability					Total
	Strongly agree	agree	Do not know	disagree	Strongly disagree	
Social responsibility and profitability can be compatible	29.1	57.3	3.9	8.7	1.0	100.0
Good ethics is often good business	66.0	33.0			1.0	100.0
Business has a social responsibility beyond making profit	15.5	38.8	8.7	25.2	11.7	100.0
Business ethics and social responsibility are critical to the survival of a business enterprise	39.6	45.5	3.0	10.9	1.0	100.0
Companies should do a lot more for society and the Environment	48.5	44.7	2.9	1.9	1.9	100.0
The overall effectiveness of a business can be determined to a great extent by the degree to which it is ethical and socially responsible	26.2	61.2	2.9	8.7	1.0	100.0
The most important concern for a firm is making a profit, even if it means bending or breaking the rules	9.7	5.8	5.8	34.0	44.7	100.0

The Correlation between Students' Perception and Attitude

Figure 5 shows the result of the correlation analysis among the variables covered by the study. students' attitude towards CSR & sustainability found to be significantly correlate (at 0.01 level of significant) with : student's Personal values / believes , coverage of curriculum to RME issues , student's perception of business responsibilities and student's perception of the role of business towards its stakeholders.

variables	Students' believes and values	RME curriculum offered	Required changes in curriculum	Importune of Business issues	Importance of Stakeholders	Importance of Business responsibilities	Application of knowledge	CSR & sustainability
Students' believes and values	1							
RME curriculum offered	-.004	1						
Required changes in curriculum	.168	.095	1					
Importance of Business issues	.339**	-.121	.440**	1				
Importance of Stakeholders	.336**	.194*	.387**	.480**	1			
Importance of Business responsibilities	.299**	.185	.425**	.301**	.380**	1		
Application of knowledge	.213*	.538**	.062	-.004	.178	.215*	1	
CSR & sustainability	.365**	.197*	.316**	.144	.214*	.349**	.323**	1

** . Correlation is significant at the 0.01 level (2-tailed). * . Correlation is significant at the 0.05 level (2-tailed).

Figure 5. The Results of the correlation Analysis

Conclusion, Practical Implications and Framework

The postgraduate business students in Sudan, shortly entering senior management level positions and playing an important role on the decision making processes, appear to have an appropriate level of appreciation for CSR and RM.

- Students exhibited positive CSR perception and attitude, with a heightened focus on acting ethically and a diminished focus on financial considerations. However, one of the key lessons is the need for continued evolution and development of CSR and ethics more generally across business curriculums in Sudan.
- Academic institutions in Sudan play a vital function in this process and it is possible that their real contribution is yet to be revealed. Initiatives such as PRME can assist them in achieving their full potential in making a real difference to the country and the world at large.
- The students are seeking the knowledge, skills, exposure and experience they need through RME to be as effective as possible in the real world. There is a room and need for improvement.
- For this to happen, business schools in Sudan are encouraged, based on students attitude and believes, to introduce more ethical and CSR core and elective units in their MBA and DBA syllabuses which are least taught as core units. Hence, business schools can foster the capabilities of students to be future generators of sustainable value for business and society at large. To the point, ethics must be advanced in its own right as part of a comprehensive curriculum. That is the role of business schools need to be seen as a creator of challenging learning settings which allow the students to not only focus on profit-maximization while neglecting their expected contribution to society and the environment.
- There is a clear call that business schools in Sudan need to acknowledge their responsibility towards sustainable ethical education of their students. Therefore, a shift towards human- and planet- centered paradigm of management appears necessary. This would require new competencies. It would also require a pedagogy that exposes students to the tensions between business and society so that students are better prepared to make judgments in complex situations; (Isler & Teta, 2012b). The competencies should help future leaders to act with responsibility towards human and planet. That is covering the CSR and sustainability aspects (i.e. economic, social, environment and governance) .
- Figure 6 illustrates the targeted learning group of competencies (outcomes) to be acquired by postgraduate business students through an appropriate RME program. The competencies should help future leaders to act with responsibility towards business and society aspects.

The interaction among sustainability aspects and RME co-created and shared values.

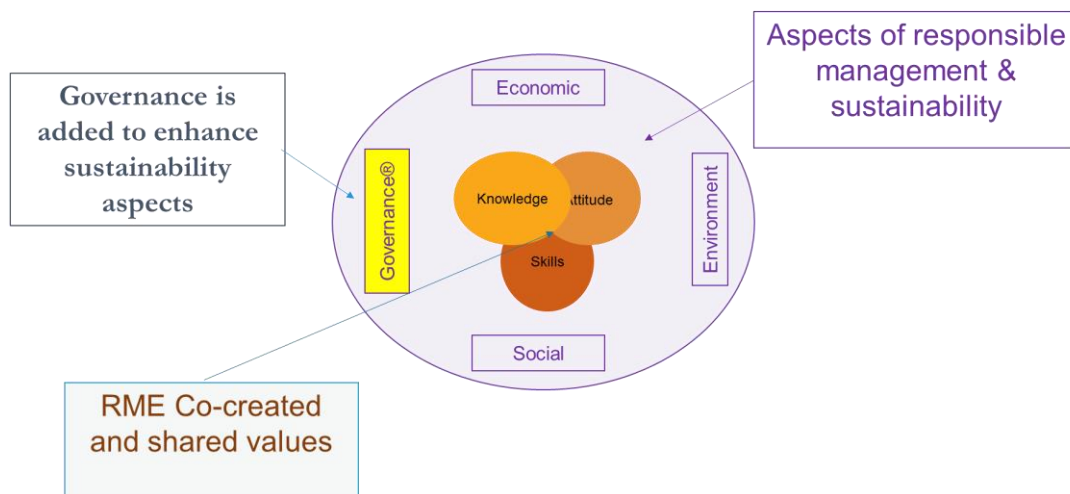


Figure 6. Targeted Learning Competencies (Outcomes) to be acquired by Postgraduate Business

- As students felt not well equipped to apply the knowledge acquired in real life with regard to “ethical decision making” and “business ethics”, business school need to reconsider changing the way the courses are delivered by applying more practical strategies. Student learning needs to occur within complex learning environments to provide active, problem-based and self-directed acquisition of knowledge,

skills and attitude. Professors are to be encouraged to introduce more applicable case studies in classes and experiential and field learning.

- Faculty members need to educate students (change –makers/ agents) deeply to know the value of things rather than their price and be responsible rather than to be rich.
- Faculty members need to emphasize more active—rather than passive—learning. They could tap into the experiences of students on live projects or simulations to bring home the interdependence between business and society and illustrate the complexities of responsible decision-making. Two approaches to create best-practice learning environments are real-life case studies and real-life student projects which both lead to strong buy-in from students, faculty and company partners.
- To that end, business schools need implement responsible management education based on shared values which are expressed in the mission statement of academic institutions and build the foundation of study programs. Students, faculties and companies need to build a partnership to jointly explore effective approaches of sustainable corporate responsibility. As such , a co-created and shared value framework might be conceptualized to develop and implement an effect RME program in business postgraduate programs
- For this to happen, at least four groups of players (enablers) need to be involved. Namely these players are: business schools, business sector, students and international setters of principle and standards related to RME. Figure 7 reflects the relationship between aspects of RM, RME co-created and shared value and the enablers. Technology is added to facilitate the processes.
- Recognizing that we “Get what we measure” and that we “Manage what we measure” A “Socio-economic Value Based” report card might be introduced to assess and report on MBA and DBA students attitude and behavior towards the society and the environment.
- It is no longer enough to state a company’s vision as “to be the best in the world”. Instead they have to be the “best for the world”.

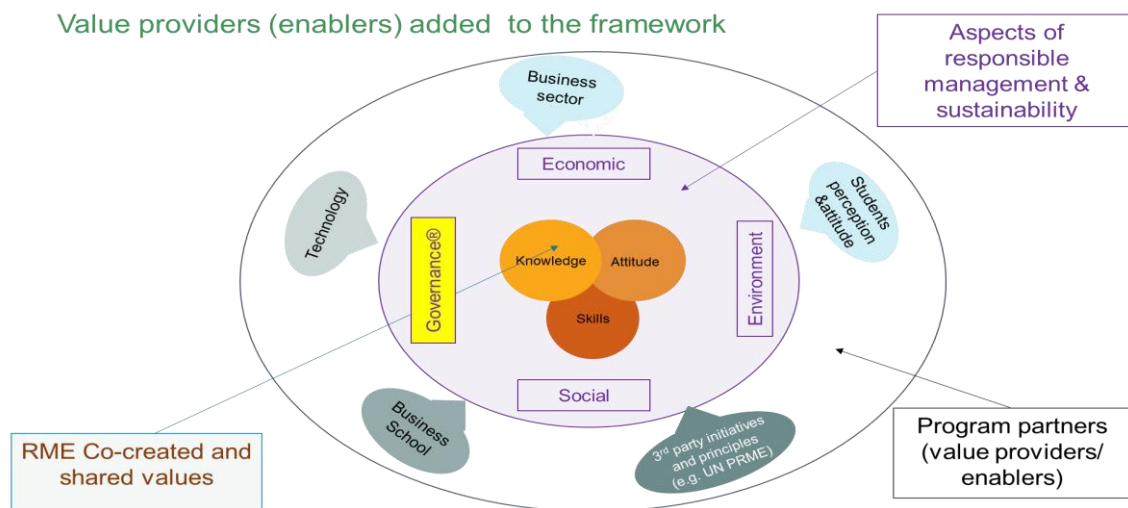


Figure 7. The Relationship between Aspects of RM, RME Co-created and Shared Value and the Enablers

The Framework Put into Context:

The variation among the students’ perception and attitude towards RM , RME, CSR and sustainability in Sudan are remarkable with regard to business aspects and issues covered by the study. These variations could be attributed to the following factors:

The community values. Worldwide, “Living according to religious faith” was ranked last as not at all important whilst rank first in Sudan. According to Jusoh et al (2015), in their study “An Islamic Perspective on Corporate Social Responsibility of Islamic Banks” argue that applying social responsibility by Muslims is rewarded in Islam since most of them fall under the concept of “enjoining good and forbidding evil” and beneficial social works which are considered ‘ibadah (worship)’. Hence, when developing RME program one need to consider community values, culture and believes.

The political and social stability. The students in Sudan thought that as business leaders they should care more about local and national peace and the reduction of violence. In Sudan, socially and security wise, massive population movement represents one of the serious challenges facing Sudan. According to the International Organization for Migration (IOM-2011) reveals at least 6.9 million people affected by migration and human displacement in Sudan. With 4.9 million internally displaced people, 750,000 foreign migrants and refugees are living in Sudan.

The importance of local and national peace. According to 2018 global ranking of peace environment index, Sudan ranked 153 out of 169 countries. Therefore, the political and social environment need to be considered when designing and implementing RME programs.

The environment sustainability. Sudan is facing serve problems including desertification and land degradation, water pollution, deforestation, soil erosion and deterioration in biodiversity. The impact of petroleum prospecting, drilling and transport on habitats, especially that of produced water on migratory birds is very disturbing .According to the Environmental Sustainability Index (ESI) 2018, Sudan scored 51/100 and rank 115/180. As such, the country’s foot-print with regard to environmental sustainability as reflected by the cleanness of its eco-system especially when dealing with land, air and water need to be taken into consideration.

The country level of development. According to the World Bank report 2017, Sudan (a developing country) GDP was US M 117,488 , per captia US \$ 2,899 and life expectancy is 64.4 years . This might explain why most students in Sudan ranked “being successful in their studies or work” higher to raise their level of life. Therefore, the students` perception and attitudes are affected by the country`s economic situation. Thus, the development of RME programs need to take this factor into account.

Having accepted that , we put the framework into context to take into consideration the internal and external environmental factors surrounding the business school or institution when attempting to develop and implement an appropriate RME program, Figure 8.

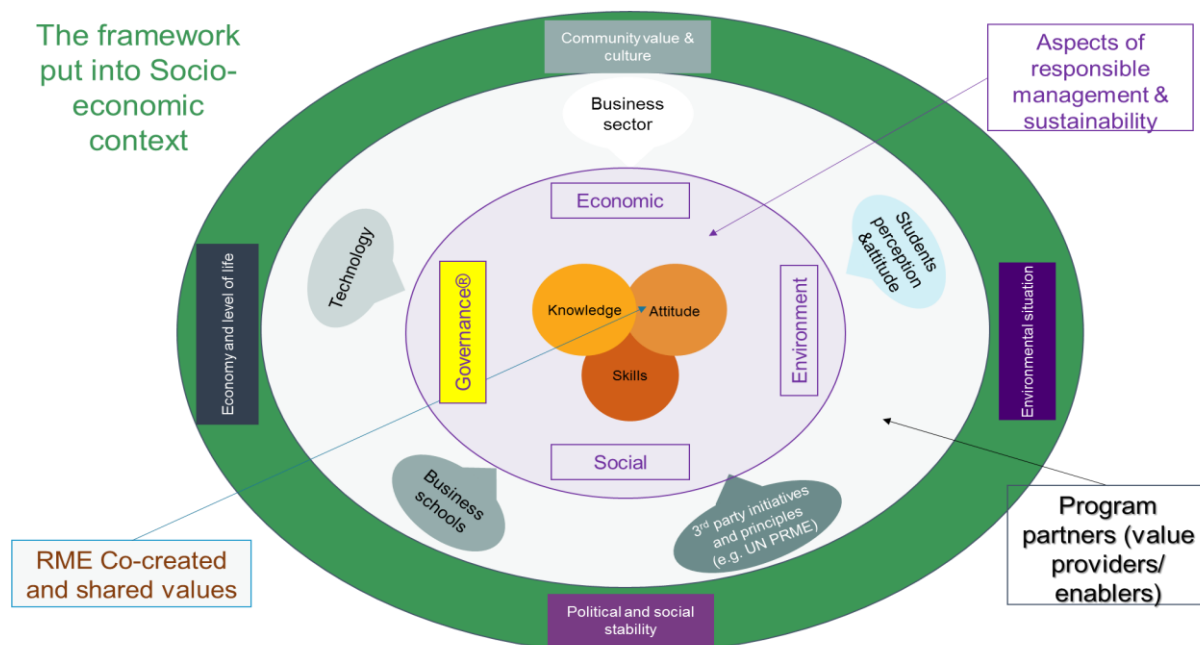


Figure 8. The framework for Developing RME Program Put into Context

Further Research

- Duplicate this study in different setting and countries.
- Test the applicability and usefulness of the proposed framework for developing RME programs.
- Explore and examine pedagogies and learning strategies that exposes students to the tensions between business and society so that students are better prepared to make judgments in complex situations.

References

- Albaum, G & Peterson , R (2006). Ethical Attitude of Future Business Leaders: Do They Vary by Gender and Religiosity? <https://journals.sagepub.com/doi/10.1177/0007650306289388>
- Baruch, Y. (1996). Programming the MBA program-the quest for curriculum. *Journal of Management Development*, 15(7), 27-36.
- Bishop, T. R. (1992). Integrating business ethics into an undergraduate curriculum. *Journal of Business Ethics*, 11(4), 291-299.
- Brown, E. (2009). Corporate Social Responsibility in Higher Education. *ACME: An International E-Journal for Critical Geographies*, 8, 474-483.
- Carroll, A. (1979). A three-dimensional conceptual model of corporate social performance. *Academy of Management Review*, 4, 497-505.
- Carroll, A. B. (1991). The pyramid of corporate social responsibility: Towards the moral management of organizational stakeholders. *Business horizons* , 34(4), 39-48.
- CPI index (2018) , <https://www.transparency.org/cpi2018>
- Collins, A. (1991). Cognitive apprenticeship and instructional technology. *Educational values and cognitive instruction: Implications for reform.* 121-138.
- Compact, U.G. (2016). Who We Are. Retrieved from UN Global Compact: <https://www.unglobalcompact.org/what-is-gc>
- Cornelius, N., Todres, M., Jivraj, S., Woods, A., & Wallace, J. (2008). Corporate Social Responsibility and the Social Enterprise *Journal of Business Ethics* (2008) 81:355–370 Springer 2007, ,
- Cotton, D.R. (2006). Implementing curriculum guidance on environmental education: The importance of teachers' beliefs. *Journal of Curriculum Studies*, 38(1), 67-83.
- Global Compact (2007). *The Principles for Responsible Management Education*, New York: United Nations.
- Goshal , S.(2005). Bad Management Theories Are Destroying Good Management Practices , *Academy of Management Learning & Education*, 2005, Vol. 4, No. 1, 75–91. <http://laszlo-zsolnai.net/sites/default/files/3/documents/Reading%201b%20Ghoshal.pdf>
- Herrington, J. R. (2010). *A guide to authentic e-learning*. New York: Routledge.
- IOM (2011). *Migration in Sudan: a country profile*, International Organization for Migration, Khartoum, Sudan)
- Isler, V., Barthelmeß, P., & Prandini, M. (2012b). *Responsible Management Education For 21st Century Leadership : A Didactic Model for Responsible Management Education*.
- Jusoh, W. & Hazlina, N. (2015). An Islamic Perspective on Corporate Social Responsibility of Islamic Banks, *Mediterranean Journal of Social Sciences*, MCSER Publishing, Rome-Italy, Vol 6 No 2 S1 March 2015.
- Mintzberg, H. (2004). *Managers, not MBAs: A hard look at the soft practice of managing and management development*. Berrett-Koehler Publishers.
- Narayam , P.S. (2012). *Central European Business Review Research Papers*, Volume 1 , No. 2 , October (2012)
- Macquarie Graduate School of Management (MGSM) (2013). *MBA students around the world and their attitude towards responsible management Second annual study, 2013* Debbie Haski - Leventha: <http://www.unprme.org/resource-docs/MGSMPRMEMBASTudentStudy2013.pdf>
- Macquarie Graduate School of Management (MGSM) *Third bi-annual study, (2016) , The State of CSR and RME in Business Schools and the Attitude of their Students:* <http://www.unprme.org/resource-docs/MGSMPRMERReport2016.pdf>
- Milton, F. (1970). The Social Responsibility of Business is to Increase its Profits *The New York Times Magazine* September 13, 1970
- Navarro, C. (2008). The MBA core curricula of top-ranked US business schools: A study in failure. *Academy of Management Learning and Education*, 7(1), 108–123.
- Porter, M.E. & Kramer, M.R. (2011). *Creating Shared Value*. *Harvard Business Review*, 89(1), 2-17.
- PRME. (2016). About Us. Retrieved 1.12.16 from: <http://www.unprme.org/about-prme/index.php>
- Ronald K.M., Bradley R.A., and Donna J.W. (1997). Towards a Theory of Stakeholder Identification and Salience: Defining the Principle of who and What Really Counts , *Academy of Management Review*, 22(4).
- Rizvi, F. & Lingard, B. (2009). *Globalizing Education Policy*, Routledge: London & New York.
- Rule, A. C. (2006). Editorial: the components of authentic learning. *Journal of Authentic Learning*, 3(1), 1-10.
- Wendling, Z. A., Emerson, J. W., Esty, D. C., Levy, M. A., de Sherbinin, A., et al. (2018). *Environmental Performance Index*. New Haven, CT: Yale Center for Environmental Law & Policy.
- Wilson, A., Lenssen, G., & Hind, P. (2006). *Leadership Qualities and Management Competencies for Corporate Responsibility Paperback – September 11, 2006* , <https://www.amazon.com/Leadership-Qualities-Management-Competencies-Responsibility/dp/0903542617>

The Impact of Tacit Knowledge Sharing on Job Performance

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Abstract: The success or failure of an organization is dependent on its ability to manage and motivate its employees. It is widely accepted that knowledge management is a critical factor affecting an organization's ability to remain competitive in the global marketplace. It is also one of the major strategic uses of informational technology. However, despite the growth in easily using and accessing online information, employees must still rely on their co-workers for knowledge sharing to deal effectively with their work. The thorny form of knowledge sharing is tacit knowledge because it is an experience that is embedded in an individual. Organizations recognize this and must develop a mechanism for obtaining this collective intelligence and skills of its employees to create a greater organizational knowledge base. Using the literature, this study critically analyzes the impact of tacit knowledge sharing on job performance. The study will also briefly explore any likely interactions between tacit knowledge sharing and explicit knowledge sharing. The main research objective is to establish an understanding of the effect of tacit knowledge sharing on job performance. The essence is to understand how organizations can more easily communicate knowledge that will increase job performance, driven by an understanding of leveraging tacit knowledge.

Keywords: Business performance, Knowledge management, Tacit knowledge, Organizational learning, Learning styles, Knowledge sharing

Introduction

In today's rapidly changing environment, knowledge is very important to an organization and is considered a very important resource. It is a key factor that affects an organization's ability to remain competitive in the business community. The increased significance and challenges of knowledge and knowledge-sharing in organizations have gained support from researchers and practitioners. As a result, organizations have come to realize that because it is a vital strategic resource the ability to obtain, develop, share, and apply it can result in sustainable competitive advantage (Bhatt, 2002). It is well accepted that human resources are the key source of the sustainable development of a business (Rowden, 2007). This is because the collective knowledge of employees is the critical factor affecting an organization's ability to remain competitive in the global marketplace (Jacobs & Park, 2009). Furthermore, it is well accepted that some organizational issues that are due to a lack of knowledge, and job performance deficiency are often a result of lack of appropriate knowledge.

According to Sharkie (2003), knowledge must be unique to the organization in order to afford competitive advantage. However, most of the learning that individuals do takes place informally and tacitly (Peroune, 2007). It is this knowledge that must become readily available to determine its impact on job performance. There are two forms of knowledge, explicit and tacit. Explicit knowledge is clearly identified, easily communicated without any vagueness and is codified and stored in a database. Tacit knowledge is the unspoken knowledge that resides in a person's head and is frequently difficult to explain or transfer (Bollinger & Smith, 2001). The study responds to the need for a more coherent understanding of tacit knowledge sharing. The essence of the study is to understand how organizations can more easily communicate knowledge that will increase job performance, driven by an understanding of leveraging tacit knowledge.

Knowledge Management

In recent years, Knowledge Management has become one of the major strategic uses of informational technology. It has become a critical issue because effective knowledge management is the basis for organization

to stay competitive. Knowledge management is the process by which communication and understanding occurs between individuals. During this process, information and knowledge are created, shared, used, and managed. Most importantly, “knowledge management focuses on organizational objectives such as improved performance, competitive advantage, innovation, the sharing of lessons learned, integration and continuous improvement of the organization” (Hajric, 2010).

According to Kridan and Goulding (2006), “the number of firms allegedly working with knowledge Management (KM) has grown increasingly. Furthermore, the purpose and goal of utilizing knowledge management are numerous. For example, knowledge management can be perceived as a way to improve job performance, improved effective sharing and usage of information within organizations, and an overall better way for organizations to become more innovative (Kridan & Goulding, 2006). Therefore, understanding the various types of critical information can help businesses provide a more accurate evaluation of job performance (Forbes, 2017). However, this is determinant on the quality of the information. Since, data inaccuracies can be instrumental in bad decision-making. Accurate and consistent data is essential to business success. If data is managed effectively, it can help organizations improve customer satisfaction and operations (Forbes, 2017). Quality information is a valuable tool used by businesses to evaluate job performance and future organizational goals (Forbes, 2017).

Tacit Knowledge

Organizational objectives are achieved by making effective use of knowledge. Therefore, it is essential that organizations concentrate more on the management of knowledge as a strategic asset and on encouraging the sharing of tacit knowledge. Knowledge sharing is a costly intangible resource that makes organization more competitive in the market. Therefore, acquiring or developing resources is crucial for increasing job performance because the more intangible the resource, the difficult it is for competitors to imitate.

Studies have shown that many job performance deficiencies are due to a lack of communicated knowledge (Peroune, 2007; Akdere & Schmidt, 2007; Kridan & Goulding, 2006). As a result, knowledge sharing which is a readiness to learn from others is accepted as having a considerable impact on job performance (Chow, 2012). However, most of the knowledge that is required to sustain corporate competitiveness is tacit in nature meaning it is entrenched in people and is not obvious to other. Tacit knowledge is unspoken knowledge; it cannot be easily codified and is not readily transferable from one person to another. However, studies have indicated that the sharing of tacit knowledge is an important attribute for team-based learning organizations. Additionally, firms that engage in continuous learning are more likely to achieve superior performance on the job. Although it is believed to be one factor that distinguishes successful managers from others; there is a lack of knowledge in terms of the affect tacit knowledge has on the process (Randeree, 2006).

In agreement, Peroune (2007) maintained that much of the knowledge in which real-world setting is based is tacit knowledge. She further asserted that ninety percent of the knowledge in any organization is entrenched in and synthesized in people’s heads. Therefore, a trusting environment has to be established to obtain the knowledge. Since, the success or failure of an organization’s knowledge management system is dependent on its ability to manage and motivate its employees; trust and collaboration are critical factors (Wang, Ashleigh & Meyers, 2006).

Trust

Tacit knowledge sharing is considered a form of intellectual capital that is preceded by the formation of trust. In order to create an organizational culture that fosters tacit knowledge sharing, trust must be built (Lin, 2007). Over the years, many businesses have struggled to improve workplace relationships. In order to successfully improve workplace relationships, businesses need to rebuild trust. Rebuilding it can be challenging because people test and break trust daily (Reina 2006). Teamwork, time, and commitment are vital in rebuilding trust within any organization.

Essentially, trust can increase organizational commitment and expertise. In fact, high levels of trust are closely related to increased employee engagement, customer satisfaction and business success. In other words, trust in the workplace helps organizations achieve quality job performance which through tacit knowledge sharing can increase employee expertise as well as the quality of information. By integrating the dynamic of trust into the

core values of the organizational culture, a company sets the precedent for interactions between not only coworkers but also management and their employees (Nešić & Lalić, 2016).

On the other hand, mistrust is the foundation of ineffective relationships. As it relates to business relationships, mistrust directly impacts tacit knowledge sharing in the workplace by threatening job performance, and damaging economic growth. Furthermore, mistrust can develop due to conflicts triggered by competition. Therefore, it is essential for businesses to resolve mistrust issues (Nešić & Lalić, 2016). Jealousy and competitiveness can also arise as a result of job insecurity. This shift in perspective leads to the unwillingness to share mental knowledge that riddles most workplaces.

Finally, competition among organizations today has developed to gain competitive advantage and success. Competition is an essential element of the concept of business because workplace behaviors are affected by competition. While competition between businesses could often be beneficial by promoting, growth, revenue and innovation, competition within a single company has the potential to negatively impact tacit knowledge sharing. In terms of sharing tacit knowledge, competition can lead employees to withhold critical information for their individual gain. For example, one worker driven to succeed at the expense of other workers can ultimately destroy relationships within the business as well as the ethics of an organization. As a result, management is the stepping stone to creating an environment of trust and willingness to share tacit knowledge. Essentially how management and their employees interact speaks to the culture of an organization's values. Studies show that employees and managers do not engage in mutually trusting relationships (Davis & Landa, 1999).

Organizational Learning

Organizational learning is defined as the process of creating, retaining, and transferring knowledge within an organization. In essence, it adds dimensions to the individual learning process, because what is learned by the individual is shared with the group (Akdere & Schmidt, 2007). According to Rudawska (2013), the purpose of organizational learning from the knowledge sharing viewpoint is to create organizational knowledge for the organization. This knowledge is needed for competitive advantage. The organizational learning process facilitates knowledge development and preserves new knowledge in organizational operations. Furthermore, the literature supports the fact that the knowledge management process affects the learning organization because knowledge management practices support organizational learning (Rudawska, 2013). Overall, findings have shown that organizational learning demonstrates an important channel to performance, success and competitive advantage for companies (Noruzi, Dalfard, Azhdari, Nazari-Shirkouhi, & Rezazadeh, (2013).

Discussion

As discussed throughout the literature, team trust is considered a major factor in knowledge sharing (Wang, Ashleigh & Meyers, 2006). As a result, the creation of a trusting environment is important. Employee loyalty is built through the formation of trust which increases the willingness to share tacit knowledge. In order to comprehend the nature of trust in the workplace, the personal perspective of the employee must be valued (Lin, 2007). Teamwork and achievement of organizational goals hold special meaning for employees who are committed to their role and organization. Feeling valued by one's company is vital to the improvement of job performance (Hosein & Seyed, 2017). When an employee feels valued, heard, and supported, they flourish in a workplace environment. These factors impact willingness to share mental knowledge and in turn, improve job performance.

Conclusion

Organizations need to remain competitive in in the global marketplace and therefore there is a demand for effective knowledge management to ensure a successful organization. Given the growing body of literature that supports knowledge as an organization's critical asset, businesses are embarking on strategies that will increase the sharing of tacit knowledge. The literature strongly supports the fact that a company's knowledge gives them advantage over their competitor. Clearly, it shows that it is important that management organize and promote the sharing and exchange of information because it normally results in beneficial organizational outcomes, such as higher performance assessment and more effective teams. Interaction between people, technologies, and

techniques allows an organization to accomplish difficult and innovative tasks. However, it is important to note that securing tacit knowledge may be a significant challenge to the organization's management.

Existing literature consistently shows that tacit knowledge sharing plays a critical role in job performance by allowing for an efficient distribution of knowledge and better productivity. In addition, the study provide insight into how sharing tacit knowledge can contribute to organizational learning and in so doing improve performance. Besides, by recognizing the factors that encourages tacit knowledge sharing and the effect it has on job performance, different techniques can be recommended and tried. The study thus confirms that understanding knowledge-sharing can help managers encourage knowledge sharing and in so doing increase the organizational body of knowledge. Equally important it will authenticate the concept that the more an organization knows the more it can learn. The study will lay a foundation for further work that could demonstrate the association between management, leadership styles and tacit knowledge sharing.

References

- Akdere, M. & Schmidt, S. W. (2007). Measuring the effects of employee orientation training on employee perceptions of organizational learning: Implications for training & development. *The Business Review, Cambridge*, 8(1), 172-177.
- Akdere, M. & Schmidt, S. W. (2007). Measuring the effects of employee orientation training on employee perceptions of organizational culture: Implications for organization development. *The Business Review, Cambridge*, 8(1), 234-239.
- Argote, L. (2013). *Organizational learning creating, retaining and transferring knowledge*. Heidelberg: Springer.
- Bass, B. M. (1985) *Leadership and performance beyond expectations*. New York: Free Press.
- Bhatt, G. D. (2002). Management strategies for individual knowledge and organizational knowledge. *Journal of Knowledge Management*, (6)1, 31-39.
- Bollinger, A.S., & Smith, R. D. (2001). Managerial organizational knowledge as a strategic asset. *Journal of Knowledge Management*, 5(1), 8-18.
- Bryant, S.E. & Terborg, J.R. (2008). Impact of Peer Mentor Training on Creating and Sharing Organizational Knowledge. *Journal of Managerial Issues*, 20(1), 11-29,7.
- Chow, H.-S. (Spring 2012). The Role of Social Network and Collaborative Culture in Knowledge Sharing and Performance Relations. *SAM Advanced Management Journal*, 24-37.
- Davis, T., & Landa, M. (1999). The trust deficit. *The Canadian Manager*, 24(1), 10,27.
- Dietel, J. E. (2017). Capturing Employees' Tacit Knowledge for Competitive Gain. *Information Management Journal*, 51(6), 38-40.
- Dussault, M., & Frenette, E., &. (2015). Supervisors' Transformational Leadership and Bullying in the Workplace. *Psychological Reports*, 117(3), 724-733.
- Forbes (2017). The Role of Data in The Age of Digital Transformation. Retrieved from the web. <https://www.forbes.com/sites/forbestechcouncil/2019/01/17/the-role-of-data-in-the-age-of-digital-transformation/#5fa0dc364509>
- Ford, David, & Hakansson, HaKan. "Competition in Business Networks. (Report)." *Industrial Marketing Management* 42.7 (2013): 1017-1024. Web.
- Glaman, J. M., Jones, A. P. and Rozelle, R. M. (2002), Competitiveness and the Similarity of Preferred Coworkers. *Journal of Applied Social Psychology*, 32: 142-158.
- Hajric, E. (n.d.). Knowledge Management Tools. Retrieved from <https://www.knowledge-management-tools.net/>
- Hosein Kamani, Seyed Mohammad. (2017). Effect of Positive Psychology Elements on Job Pride and Honor with an Emphasis on Mediating Role of Communication among Faculty Members of Shiraz University of Medical Sciences. *International Journal of Environmental and Science Education*, 12(4), 841-849.
- Hsieh, H. (2007) *Organizational characteristics, knowledge management strategy, enablers, and process capability: Knowledge management performance in United States software companies*. Ph.D. dissertation, Lynn University, United States -- Florida. Retrieved April 15, 2008, from ProQuest Digital Dissertations database. (Publication No. AAT 3256804).
- Jacobs, R.L., & Park Y. (2009). A proposed conceptual framework of workplace learning: Implications for theory development and research in human resource development. *Human Resource Development Review*, 8(2), 133.
- Kiehl, J.K. (2004) *Learning to change: Organizational learning and knowledge transfer*. Ph.D. dissertation, Case Western Reserve University, United States -- Ohio. Retrieved April 27, 2008, from Dissertations & Theses: Full Text database. (Publication No. AAT 3119593).

- Kridan, A. B., Goulding, J.S. (2006). A case study on knowledge management implementation in the banking sector. *VINE*, 36(2), 211-222. Retrieved May 7, 2008, from ABI/INFORM Global database. (Document ID: 1085062391).
- Kucharska, W. (2017). Relationships Between Trust and Collaborative Culture in The Context of Tacit Knowledge Sharing. *Journal of Entrepreneurship, Management and Innovation*, 13(4), 61.
- Lin, C. (2007). To Share or Not to Share: Modeling Tacit Knowledge Sharing, Its Mediators and Antecedents. *Journal of Business Ethics*, 70(4), 411-428.
- Lin, C., Chen, S., & Wang, R. (2011). Savouring and perceived job performance in positive psychology: Moderating role of positive affectivity. *Asian Journal of Social Psychology*, 14(3), 165-175.
- Lin, H. (2006). Impact of organizational support on organizational intention to facilitate knowledge sharing. *Knowledge Management Research & Practice*, 4(1), 26-35.
- Nešić, Ana & Lalić, Danijela. (2016). The Impact of Trust on Job Performance in Organizations Management, 21(81), 27-34.
- Noruzy, A., Dalfard, V., Azhdari, B., Nazari-Shirkouhi, S., & Rezazadeh, A. (2013). Relations between transformational leadership, organizational learning, knowledge management, organizational innovation, and organizational performance: an empirical investigation of manufacturing firms. *International Journal of Advanced Manufacturing Technology*, 64(5-8),
- Peroune, D. L. (2007). Tacit knowledge in the workplace: the facilitating role of peer relationships. *Journal of European Industrial Training*, 31(4), 244-258.
- Randeree, E. (2006). Knowledge management: Securing the future. *Journal of Knowledge Management*, 10(4), 145-156.
- Reina (2006). Trust and Betrayal in the Workplace: Building Effective Relationships in Your Organization. Williston: Berrett-Koehler. "Restoring Trust in the Workplace." *Security Dealer & Integrator* Jan. 2016. Business Insights: Global. Web. 31 Mar. 2019.
- Richter A. & Näswall K. (2019.) Job insecurity and trust: Uncovering a mechanism linking job insecurity to well-being, *Work & Stress*, 33:1, 22-40.
- Rowden, R. (2007). *Workplace learning principles and practice*: Malabar, FL: Krieger Publishing Company.
- Rudawska, A. (2013). The Learning Organization Idea in the Context of Organizational Learning and Knowledge Management. *Contemporary Management Quarterly / Współczesne Zarządzanie*, 12(4), 97-109.
- Sharkie, R. (2003). Knowledge creation and its place in the development of sustainable competitive advantage. *Journal of Knowledge Management*, 7(1), 20-31.
- Wang, J., Ashleigh, M., & Meyers, E. (2006, August). Knowledge sharing and team trustworthiness: it's all about social ties! *Knowledge Management Research & Practice*, 4(3), 175-186.
- White, James D. (2007) Knowledge sharing in a human resource community of practice. Ph.D. dissertation, Walden University, United States -- Minnesota. Retrieved October 3, 2007, from ProQuest Digital Dissertations database. (Publication No. AAT 3252829).
- Wurst, Michael, (2006). Analysis and evaluation of distributed knowledge management by agent-based simulation. *International Journal of Knowledge Based Intelligent Engineering Systems*, 10(4), 307-317.
- Yang, J. (2007). Knowledge sharing: Investigating appropriate leadership roles and collaborative culture. *Tourism Management*, 28(2), 530-543.

Implementation of the Instructional Practices Inventory – Technology Process with Fidelity: The Impact on Technology Use and Student Cognitive Engagement

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Abstract: A small rural high school committed to becoming a high-tech school. However, data collected using the IPI-T process suggested teachers were typically the users of the technology, students were often disengaged, and teachers were asking students to participate in lower-order surface activities. Missing from the process was the implementation of the faculty collaborative sessions. One year after the initial rollout of the devices, faculty collaborative sessions were planned and facilitated within one week of collection data. Teachers (a) became familiar with the IPI-T Rubric and Protocols, (b) analyzed and discussed the data, (c) identified high-quality examples of student learning that foster student engagement with technology, (d) designed high-quality lessons that foster student engagement with technology, (e) compared longitudinal data and set goals for future data collection using the IPI-T tool. An analysis of the data revealed when implementing the IPI-T process with fidelity teacher and student technology use increased as did student cognitive engagement when using technology. In addition, it was found that students use technology for information searches the majority of the time rather than media development or to collaborate among peers for example, which are associated with higher-levels of cognitive engagement.

Keywords: Educational technology, Student cognitive engagement, Instructional Practices Inventory-Technology, Technology integration

Introduction

In an effort to provide access to technology and prepare students for the “digital complexities of the future”, school board members in a small, rural community in Southern Iowa approved the purchase of Chromebooks to be distributed within the local high school. The school board and administration was interested in determining if students were using the devices as well as if they were cognitively engaged when using technology. As a result, they sent the researcher and a team of teachers to a workshop to be trained in the Instructional Practices Inventory – Technology (IPI-T) process.

According to Valentine (2017), “When IPI/IPI-T data are collected for the purposes of school improvement, all teachers should have the opportunity to study the data and reflect upon their perceptions of effective learning/instructions” (p. 3). Faculty should converse about best practices and the value of the six categories. Once a baseline is established, discussions about how to change the engagement profiles over time should occur to ensure instructional design and teaching practices evolve. The first data collection profile should serve as baseline data and future data collections provide longitudinal perspectives of engaged learning for the school. Valentine (2017) recommends each school collect data four times each school year to achieve optimum impact. Teacher leaders collecting the data should engage faculty in studying the data to identify patterns, trends, and changes in each data profile as well as establish and deliver purposeful professional development and continuous conversations.

Rationale for Studying Student Engagement

For many years, cognitive psychologists studying cognitive engagement have noted “that as students get older and progress through the K-12 learning experience, the pattern of focus during learning time declines (as cited by Valentine, 2013, p. 2). Valentine (2013) reported, “In our IPI data, this is evidenced by the lower average percentages of disengagement during elementary school (2-3%) followed by higher percentages in middle schools (3-4%) and the highest percentages in comprehensive high schools (6-8%)” (p. 2). Not surprising when considering today’s students are different from generations before them (McCrindle, 2014; Prensky, 2005; Schrum & Levin, 2015; Tapscott, 2009).

Technology's influence on brain development of today's students implies the need to make thoughtful and informed decisions about the engagement of learners and changing instruction to meet the needs of today's learners (Autry & Berge, 2011; Milman, 2009; Prensky, 2001a, Tapscott, 2009). Many of today's students, particularly as they progress to high school, appear to be disengaged, unmotivated, and uninterested in learning (Prensky, 2001a; Prensky, 2005; Schrum & Levin, 2015). Shernoff, Csikszentmihalyi, Schneider, and Shernoff (2003) reported over a quarter of the day, secondary students are in a disconnected state, such as boredom (as cited by Jensen, 2016). In an effort to align current teaching practices with the integration of technology and reach today's students, the IPI and IPI-T process assists in the collection of data to get an insight into how students are engaging in the learning during the instructional activity.

Purpose of the Study

The purpose of this explanatory-sequential mixed method study was to assess the impact of the IPI-T process on technology use and student cognitive engagement. The goal was to implement all strategies, including faculty collaborative sessions four times per year to support teacher implementation of new technology to increase higher-order, deeper thinking by students and increase student use of technology.

Research Questions

1. To what extent does participation in faculty collaborative study sessions affect faculty's technology use as measured by codes on the Instructional Practices Inventory Technology (IPI-T)?
2. To what extent does participation in faculty collaborative study sessions affect student's technology use as measured by codes on the Instructional Practices Inventory-Technology (IPI-T)?
3. How do faculty view their participation in faculty collaborative study sessions? Specifically, did participating affect the teacher's use of technology use in the classroom?
4. How do faculty view their participation in faculty collaborative study sessions? Specifically, did participating affect students' use of technology use in the classroom?

Method

The design employed was an explanatory-sequential mixed methods approach. The quantitative portion of this study used the IPI-T instrument, a pre-determined and numerically coded instrument, to collect data concerning the frequency and scale of student cognitive engagement as technology is integrated into the classroom (Larinee, 2003; Valentine, 2015). Observational data collected using the IPI-T was recorded numerically for analysis and interpretation through descriptive and inferential statistics (Valentine, 2015). A web-based questionnaire, created by the researcher, was used to collect qualitative data. The questionnaire consisted of both closed-ended and open-ended questions. Data collected from the qualitative strand was analyzed for themes and then because the data was collected in sequence, findings were associated with the quantitative results of the IPI-T to determine how and why the data converged.

Participants

The research participants are employed within a school district located in southern, rural Iowa. The district includes five buildings: (a) preschool; (b) kindergarten and first grade; (c) second through fifth grade; (d) the middle school which houses students in grades six through eight; (e) the high school, grades nine through twelve. This research study involved only the high school, grades 9-12 because technology is nearly one device per two students.

Quantitative

A convenience sampling strategy was employed for the quantitative strand of the study. The quantitative method was a quasi-experimental within-subjects approach utilizing a pretest and posttest design. Participants included 27 faculty members, 11 males and 16 females. Each participated in faculty collaborative study sessions within

one week from the collection of data using the IPI-T Recorder App. statistics were used to analyze the nominal data and main effects of participation in faculty collaborative sessions, particularly the effect on IPI-T student cognitive engagement codes using the parametric statistic of analysis of variance (ANOVA).

Qualitative

The sampling strategy for the qualitative strand was a purposeful sample, utilizing a confirming and disconfirming sampling procedure during the study to follow up on and explore specific findings (Creswell, 2015). A single person from each content area, listed on the IPI/IPI-T Data Recording Form, was identified and invited to volunteer to participate in an open-ended, web-based questionnaire. Content areas included core classes: math, science, social studies, and English and language arts, as well as non-core classes: fine and performing arts, physical education and health, vocational technology, and special education.

Results and Discussion

An examination of the data revealed that participation in faculty collaborative study sessions had a statistically significant impact on student technology use as well as student cognitive engagement when using technology. While teacher technology use did increase, the expected impact of participating in faculty collaborative study sessions was that teachers' technology use would actually decrease. Descriptive statistics revealed more often students participate in information searches and word processing when they are the users of technology which are associated with lower-order/surface thinking. Furthermore, results showed that 31% of the codes collected, higher-order/deeper thinking was observed when students were the user of technology. Technology use categories observed at a higher level included media development, collaboration among individuals, and experience-based technology.

For the qualitative portion, data were thematically analyzed and interpreted looking for overlapping themes within the open-ended questions, with the goal of providing a greater understanding of the quantitative results and the impact the faculty collaborative study sessions had on technology use and student cognitive engagement. Four key themes emerged: (a) technology integration, (b) implementing new technology, (c) awareness of tech usage, and (d) more time. Of the four themes that emerged from the questionnaire responses, the greatest overlap was regarding awareness. In line with first order-external barriers, all eight of the participants mentioned that more time is necessary. Specifically, participants stated that they need more time to study and analyze the IPI-T data as well as to participate in purposeful professional development.

Conclusion

Findings from this mixed methods study confirm that implementing the entire IPI-T process with fidelity has been shown to have a positive influence on student technology use and student cognitive engagement. School board members in the targeted district have already purchased \$250,000 worth of Chromebooks and have committed to additional purchases in the upcoming school year. As they move toward a 1:1 environment, longitudinal data can be studied and the IPI-T process can drive collaborative discussions among teachers and leaders to ensure a successful adoption of technology.

Recommendations

Future research should extend these findings by replicating this study with faculty from the same school district in different grade levels or with the same faculty, grades 9-12, to gather longitudinal data. Findings from future research, examining the impact of participating in faculty collaborative study sessions at multiple grade levels, could be used to inform district initiatives, school improvement, and the development of professional development to integrate technology. The IPI and IPI-T encourages faculty members to work towards a balance of higher and lower levels of student cognitive engagement through incremental changes in instructional practice (Dennis, 2013). Additionally, future studies should include an examination of the change in technology instructional practices when faculty participate in faculty collaborative study sessions over a period of time.

References

- Autry, Alex J., Jr. & Berge, Z. (2011). Digital natives and digital immigrants: Getting to know each other. *Industrial and Commercial Training*, 43(7), 460-466. doi:10.1108/00197851111171890
- Creswell, J. W. (2015). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (5th ed.). Lincoln, NE: Pearson.
- Dennis, L. B. (2013). How Are Teachers Integrating Technology in K-5 Classrooms? Studying Student Cognitive Engagement Using the Instructional Practices Inventory-Technology (IPI-T) Instrument. New Mexico State University, Las Cruces, New Mexico.
- Jensen, E. (2016). *Poor students, rich teaching: Mindsets for change*. Indiana: Solution Tree Press.
- Larinee, D. B. (2013). *How are teachers integrating technology in K-5 classrooms: Studying student cognitive engagement using the Instructional Practices Inventory-Technology (IPI-T) instrument*. (Unpublished doctoral dissertation). New Mexico University, New Mexico.
- McCrinkle, M. (2014). *The ABC of XYZ: Understanding the global generations*. Australia: A McCrinkle Publication.
- Milman, N. B. (2009). Are students today really different? *Distance Learning*, 6(2), 59-61. Retrieved from <http://search.proquest.com.ezproxylocal.library.nova.edu/docview/230703086?accountid=6579>
- Prensky, M. (2001). Digital Natives, Digital Immigrants, part I. *On the Horizon*, 9(5), 1-6. Retrieved from http://old.ektf.hu/~kbert/2014_15_01/erasmus/DigitalNativesPartIII.pdf
- Prensky, M. (2005). Teaching digital natives: Partnering for real learning. Retrieved from http://marcprensky.com/wp-content/uploads/2013/04/Prensky-TEACHING_DIGITAL_NATIVES-Introduction1.pdf
- Schrum, L. & Levin, B. (2015). *Evidence-based strategies for leading 21st century schools*. California: Corwin.
- Tapscott, D. (2009). *Growing up digital: How the Net Generation is changing our world*. New York: McGraw Hill.
- Valentine, J. (2013). Frequently requested facts and figures about student engagement. Unpublished manuscript.
- Valentine, J. (2015). The Instructional Practices Inventory- Technology (IPI-T): IPI-Technology Component Workshop description. Unpublished manuscript.
- Valentine, J. (2017). The IPI Process-Basic perspectives. Unpublished manuscript.

Familial Influence on Engineering Student Sense of Belonging and Identity

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Abstract: As social beings, humans are influenced by other individuals in the contexts in which they interact. From early childhood through young adulthood, the family is one of the most significant social contexts contributing to one's identity development and social capital as they relate to education and career goals. Students' intended career paths and decisions about college are impacted by familial and societal factors (Inchara, Gayathri, & Priya, 2019). Additionally, family members often act as a source of support and inspiration for college students when they are deciding on their major and future career (Meador, 2018). While current engineering education research has focused on the role that parental education attainment and profession play in engineering students' persistence, choice of major, and career pathways (Martin & Simmons, 2014), there has been little examination of how familial social capital influences students' sense of belonging and engineering identity. The purpose of the current study is to investigate the impact of familial influence, determined through parental education levels and professions, on undergraduate engineering students' sense of belonging in their engineering major, engineering identity, and academic performance. Results for this sample did not suggest that familial influence for undergraduate engineering students will significantly affect their sense of belonging and engineering identity. These findings and potential implications are discussed.

Keywords: Familial Influence, Engineering students, Sense of belonging, Sense of identity

Introduction

As a critical context for development, the family system contributes to youth's identity development and social capital. Familial influence often feeds into youth's decisions about college and their future careers (Inchara, Cayathri, & Priya, 2019). Additionally, family members often act as a source of support and inspiration for college students when they are deciding on their major and future career (Meador, 2018). While current engineering education research has focused on the role that parental education attainment and profession play in engineering students' persistence, choice of major, and career pathways (Martin & Simmons, 2014), there has been little examination of how familial social capital influences students' sense of belonging and engineering identity. The purpose of the current study is to investigate the following questions:

1. What is the impact of familial influence on undergraduate engineering students' sense of belonging in their engineering major?
2. What is the impact of familial influence on undergraduate engineering students' engineering identity?

Familial Influence

In the current study, familial influence acts as a predictor for engineering students' sense of belonging and engineering identity. As evidenced by systems theories, the family context is a significant arena for youth development cognitively, emotionally, and socially (Cox & Paley, 1997). The family system within which a youth is embedded sets the stage for their behaviors and beliefs around their future profession. Familial influence is related to the concept of social capital, which is comprised of one's social networks, the norms followed in these social networks, and the value placed on these networks and norms as one works to achieve their goals (Baron, Field, & Schuller, 2000). In this way, the family system acts as a critical social network and influences students' beliefs about acceptable behaviors and expectations (Martin, Simmons, & Miller, 2014).

Students' intended career paths and decisions about college are impacted by familial and societal factors (Inchara, Gayathri, & Priya, 2019). Family members often act as a source of support and inspiration for college

students when they are deciding on their major and future career (Meador, 2018). Parental and sibling guidance has been shown to influence undergraduate engineering students' choice of major and persistence at their chosen institution (Brisbane et al., 2019). One study found that choice of engineering major was influenced more significantly by a sibling or other relative being affiliated with engineering than by a parent (Godwin, Potvin, Hazari, 2014). While this literature demonstrates that there is a relationship between familial education background as an engineer and students' choice to major in engineering, past studies have called for additional work to go further by focusing on how familial influence predicts engineering identity and sense of belonging in engineering (Godbole, Miller, Bothwell, Montfort, & Davis, 2018).

Sense of Belonging in Engineering

In the context of engineering, sense of belonging can best be defined as a feeling of inclusion and willingness to engage with one's peers, instructors, and materials in an engineering setting (Wilson et al., 2015). Within an engineering classroom, sense of belonging is comprised of academic belonging and social belonging (Schar et al., 2017). Therefore, sense of belonging has important implications for academic self-efficacy and motivation in the context of learning engineering content (Schar et al., 2017). Engineering students' sense of belonging can be inhibited by a number of factors including financial barriers, pressures related to course-load, self-efficacy in engineering content and technical knowledge, and comfort in university or college environment (Smith & Lucena, 2016). A lack of sense of belonging has been linked to attrition at the university level, while an abundance of sense of belonging is correlated to persistence within a university and major (Good, Rattan, & Dweck, 2012).

Engineering Identity

Undergraduate engineering students must have a moderate to strong sense of engineering identity in order to persist through their major, earn a degree, and begin working in the field. Engineering identity can be described through its three vital components: interest in engineering topics, self-perception as capable of "doing" engineering, and empowerment by themselves and others to self-label as an engineer (Rohde et al., 2019). While one study found that peers and instructors have a more weighted influence on engineering identity for graduate students pursuing a professional degree in engineering, the family's impact remains a salient factor contributing to engineering identity (Choe & Borrego, 2019). However, because of the lack of exposure to advanced peers and engineering professionals upon entry to the university, the assumption can be made that the family context remains more impactful for undergraduate students, especially those at the outset of their careers as engineering majors.

Methods

Sample

Data for this project are from larger study funded through a National Science Foundation IUSE/Professional Formation of Engineers: Revolutionizing Engineering Departments (IUSE/PFE: RED) grant. The sample for this study included 343 sophomore, junior, and senior undergraduate student participants who were enrolled in a single engineering major. Participants' race/ethnicity and gender demographics are included in Table 1.

Table 1. Race/Ethnicity and Gender Demographics for Study Participants

	Total Sample
<i>Race/ethnicity</i>	
<i>n</i>	342
% White	85%
% Black or African American	5%
% Asian	3%
% One or more race	6%
<i>Gender</i>	
<i>n</i>	342
% Male	78%
% Female	22%

Data Collection

Protocol. Data were collected in students' face-to-face lab section meetings using an online data collection platform (Qualtrics citation). Data were collected during the Spring 2019 academic semester over a time period of two weeks, and collection sessions were led by members of the research team using a single administration protocol.

Measures. The study included measures of familial influence as well as student sense of belonging and sense of engineering identity. Familial influence was measured through parent education and social capital. To measure parental education level, student participants indicated the highest level of education completed by their parent(s). Social capital was measured through a combined score of parental occupation type from each parent indicated by the participant (Engineering, Non-engineering STEM, or non-STEM). These two scores were combined to provide a single score for familial influence.

Student sense of belonging was measured through 24 survey items using a 7-point Likert-type scale (1=*not at all*, 7=*very much so*). The results of these items were then combined to provide a measure of an overall mean score of student sense of belonging. Engineering identity was measured through 14 survey items using a 7-point Likert-type scale (1=*strongly disagree*, 7=*strongly agree*). The scores across items were combined to give an overall mean student engineering identity score for each participant.

Data Analysis

Data were analyzed utilizing simple linear regressions. Tests were run to determine the relationship between familial influence and sense of belonging and familial influence and engineering identity. Prior to running analyses, participants' indications of parental occupation type were recoded using a simple coding method in Excel where parent 1 reported occupation was combined with parent 2 occupation (i.e. Parent 1 Engineering + Parent 2 Engineering = 1; Parent 1 Engineering + Parent 2 STEM = 2). While the majority of participants (339) listed two parent occupations, four students list single parent occupations. This recoding allowed for participants to have a single score for parental occupation type across one or both parents. Parental occupation type was then combined with parental education level to generate a single variable called familial influence.

Results

An initial linear regression was calculated to predict engineering student sense of belonging based on familial influence, as measured by parent education and social capital. A non-significant regression was found ($F(1,260) = 0.805, p < .371$ with an R^2 of .003. Participants' predicted sense of belonging is equal to $4.569 + .012$ (familial influence) when familial influence is measured by mean score of 1-7. Participants' sense of belonging in engineering was not significantly predicted by the familial influence variable.

An additional linear regression was calculated to predict engineering student identity based on familial influence, as measured by parent education and social capital. A non-significant regression was found ($F(1,258) = 0.568, p < .425$ with an R^2 of .002. Participants' predicted engineering student identity is equal to $5.527 + .017$ (familial influence) when familial influence is measured by mean score of 1-7. Participants' engineering student identity was not significantly predicted by the familial influence variable.

Discussion

Results of the two linear regressions suggest that familial influence as measured by parental education level and parental occupation type does not significantly predict participant sense of belonging in engineering or participant engineering identity in the identified sample. These non-significant test results offer insight into both features of the study as well as opportunities to improve the study to better capture the influence of families on student sense of belonging and engineering identity.

It is important to consider how well parental occupation acts as a proxy for familial influence. For example, it is possible that additional measurable predictors, such as parental encouragement and engagement, may be more aligned with the framework used to conceptualize familial influence. Though these predictors were not included

in the survey, questions related to parental encouragement and engagement should be included in future qualitative follow-up protocol. If student responses demonstrate that these have a meaningful influence on sense of belonging and engineering identity, related questions should be added in the next iteration of the survey.

The design of this study could be strengthened in two primary ways. First, the question on the instrument related to familial influence asked students to indicate the professional field of their parent(s)' work. This question may have led to confusion for students if 1) they were not aware of what constitutes a STEM profession, 2) their parent(s) switched fields by entering into or out of a STEM field throughout the student's life, or 3) their parent(s) worked at engineers, which technically also falls within the STEM category. This limitation can be avoided in the future by adding additional options for students to choose, creating a space for students to list their parents' professions, or following up with semi-structured interviews. An additional limitation exists in the fact that data for the current study was collected from one university. Therefore, these results are not generalizable to all undergraduate engineering students.

Recommendations for Future Research

The results of the current study would be strengthened with the addition of a qualitative component. Through interviews and focus groups, this component could explore how students' perceive familial influence impacting their sense of belonging and engineering identity. Interpretation of qualitative would bolster research on this topic by either substantiating claims made based on quantitative survey data or highlight areas where significant divergence occurs between quantitative and qualitative findings. Additionally, future research should consider how demographic differences in families influence students' sense of belonging in engineering and their engineering identity.

Conclusion

The purpose of this paper was to analyze the impact of familial influence on undergraduate engineering students' sense of belonging and engineering identity. While findings from the current study suggest that there is not a significant relationship between familial influence and student sense of belonging and engineering identity, there is value in further exploring this space and continuing to conduct research related to familial influences for undergraduate engineering students.

References

- Baron, S., Field, J., & Schuller, T. (2000). *Social capital: critical perspectives*. New York, NY: Oxford University Press.
- Brisbane, J.M., Gallagher, E., Hines, A.E., Murphy, J., Dunwoody, I.A., Patel, K., Gramopadhye, A.K. (2019). Familial influences affecting student pathways to engineering at two-year and four-year institutions. *Proceedings of the ASEE Annual Conference and Exposition*. Tampa, FL: American Society for Engineering Education.
- Choe, N. H., & Borrego, M. (2019). Prediction of Engineering Identity in Engineering Graduate Students. *IEEE Transactions on Education*, 62(3), 181–187.
- Cox, M.J. & Paley, B. (1997). Families as systems. *Annual Review of Psychology*, 48, 243-267.
- Godbole, A., Miller, B., Bothwell, M. K., Montfort, D., & Davis, S.C. (2018). Engineering students' perceptions of belonging through the lens of social identity. *Proceedings of the ASEE Annual Conference & Exposition*. Salt Lake City, UT: American Society for Engineering Education.
- Godwin, A., Potvin, G., & Hazari, Z. (2014). Do engineers beget engineers? Exploring connections between the engineering-related career choices of students and their families. *Proceedings of the ASEE Annual Conference and Exposition*. Indianapolis, IN: American Society for Engineering Education.
- Good, C., Rattan, A., & Dweck, C. S. (2012). Why do women opt out? Sense of belonging and women's representation in mathematics. *Journal of Personality and Social Psychology*, 102(4), 700.
- Inchara, R., Gayathri, R., & Priya, V. V. (2019). Awareness on the choice of profession among school students - A survey. *Drug Invention Today*, 11(4), 871–874.
- Martin, J.P., Miller, M.K., & Simmons, D.R., (2014). Exploring the theoretical social capital "deficit" of first generation college students: Implications for engineering education. *International Journal of Engineering Education*, 3(4), 822-836.

- Martin, J.P., & Simmons, D.R. (2014). Family roles in engineering undergraduates academic and career choices: Does parental education attainment matter? *International Journal of Engineering Education*, 30(1), 136-149.
- Meador, A. (2018). Examining recruitment and retention factors for minority STEM majors through a stereotype threat lens. *School Science & Mathematics*, 118(1/2), 61-69.
- Rohde, J., Musselman, L., Benedict, B., Verdin, D., Godwin, A., Kim, A., ... Potvin, G. (2019). Design Experiences, Engineering Identity, and Belongingness in Early Career Electrical and Computer Engineering Students. *IEEE Transactions on Education*, 62(3), 165-172.
- Schar, M., Pink, S. L., Powers, K., Piedra, A., Torres, S. A., Kai Jun Chew, & Sheppard, S. (2017). Classroom Belonging and Student Performance in the Introductory Engineering Classroom. *Proceedings of the ASEE Annual Conference & Exposition*. Columbus, OH: American Society for Engineering Education.
- Smith, J. M., & Lucena, J. C. (2016). Invisible innovators: How low-income, first-generation students use their funds of knowledge to belong in engineering. *Engineering Studies*, 8(1), 1-26.
- Wilson, D., Jones, D., Bocell, F., Crawford, J., Kim, M.J., Veilleux, N., Floyd-Smith, T., Bates, R., & Plett, M. (2015). Belonging and academic engagement among undergraduate STEM students: A multi-institutional study. *Research in Higher Education*, 56(7), 750-776.

Insight on Planning and Assessing the Teaching-Learning Process

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Abstract: Today, talking about educational planning generates a certain vital importance for the achievement of the goals and objectives previously established, as well as the definition of the steps and means necessary to carry out this process. However, we cannot talk about planning without addressing the assessment process as an essential element to review, through concrete and reliable criteria, how many goals have been achieved and under what conditions. This article discusses the important relationship between two essential areas at educational level: Planning and Assessing during the Teaching and the Learning Process. The main purpose of this work is to present a pedagogical tool that could facilitate the organization and the establishment of a follow-up in an actual form and thus contribute to the improvement of the study programs. In this article, readers interested in this field of education will find considerable ideas that would help them to understand the transcendence of systematized planning and organized assessment under a complex process, to complement their didactic training and thus make practical decisions that allow them to reach the established objectives. It seems that both Planning and Assessing work together to the achievement of the outcomes. But under what circumstances and conditions should be done the whole merging?

Keywords: Assessment, Planning, Learning and teaching process

Introduction

I believe that only by studying carefully the past, we can anticipate the future and understand the present, and consequently, the history of teaching would be the best of pedagogical schools (Durkheim I:13)

Today, talking about planning generates a certain indispensable importance for the achievement of the goals and objectives previously established, as well as the definition of the steps and means necessary to carry out this process. However, we cannot talk about planning without addressing the evaluation process as an essential element to review, through concrete and reliable criteria, how many goals have been achieved and under what conditions. Many authors and different texts unify their vision of educational planning that must be flexible, with clear and realistic goals, surrounded by a formula so that it is evaluable (in other words, observable and measurable), quantitative and qualitative, while including each of the elements involved in the process. This said that theory, reflection and practice must be inseparable, based on a philosophy that postulates more specifically a further interiorization of the art of education and teaching, a constant appreciation of the action of the teacher and her/his attitudinal changes resulting from a better understanding of ends and means, a critique of inappropriate practice as well as current ideologies.

Learning is a complex phenomenon, and rather than trying to explain what it is, one must simply recognize its complexity and say that it is better projected in the performance of learners (Ohlsson & Rees, 1991). On the other hand, different insights start from the meaning of the term "Teaching-learning Process" (TLP) where many theorists – as Paulo Freire (1972) – expresses themselves in different ways such as:

1. Stating that the name is incorrect and that the term "Teaching" must be eliminated because "nobody teaches anyone", i.e., that everyone learns in the dialogue (Freire takes here the term to its extreme definition). (P.67)
2. Understand the TLP as a process of transferring the knowledge in an unidirectionally (from teacher to student) and verbal way.
3. To talk about TLP as a dynamic process that allows the realization of relevant activities that, on their part, - through appropriate means – improve students' ability to learn how to effectively solve problems related to the content of certain subject (Educational technology).
4. Understand the TLP as a social process whose objective is to generate a critical awareness among students in order to form generations who seek the transformation of their society and construction of justice (critical didactics).
5. Understand TLP as a student-centered process whose goal is to continue, through meaningful experiences, that each learner can maximize her/his human potential as an agent responsible for her/his own development.

In the majority of these cases, it is understandable that teaching could not be separated from learning; outside, during this process, teachers and learners are being led at hand at all times, especially at the level of critical and humanistic currents. From the integral humanistic point of view, it is supposed and purported to bring a notion of the TLP and to aim to the search of an open system of planning and evaluation, so that could become a global and an inclusive element. Some of the basic reasons that could enrich the whole process are listed below:

- a. As stated by Musial, Pradère and Tricot (2012), Planning is to be engaged into a rational approach of design to effectively prepare the implementation of Teaching. It then begins with an approach to goals, not understood as observable or measurable behaviors to which students are exposed, or as learned content or skills, but understood as a reflection on a realistic dimension, such as the planning of basic concepts whose purpose is to seek to understand the judgments or affirmations during the course of a real event, without forgetting the necessary decisions to be considered throughout the process.
- b. Planning is predicted to achieve goals through well-established outcomes, but not just as content volume, design activities or establishing an infinite series of techniques, but also as a heuristic process in which we are supposed to create an environment where we do share experiences, trigger dialogues, address key concepts, reflect implicit values, and so on. Basically, we help to think and work on different dimensions.
- c. Assessing is probably making value judgments related to the broadening of the horizon of each individual or group of people. It is above all a qualitative procedure, even though it includes the part of formal quantitative accreditation that sets parameters to examine the attention, the understanding of the concepts, the quality of the reflection and the analysis of the human, scientific and ethical implications views on the course.

It should be noted that any assessment process requires rules on which an evaluated judgment depends. This compromises a process that evaluates, estimates or renders a judgment about a performance that can be exhibited, transmitted, performed, or presented in a real and authentic way. It is a process in which students not only complete or demonstrate the desired behavior, but perform it in a context of their real life. However, it all depends on classrooms teaching practices and various tools to assess student learning. Questions like: “What are we looking for when we assess?”, and “How can practices be used for the benefit of teaching and evaluation processes?” help to generate decisions and develop strategies that aim to improve the academic level of learners. Some authors, such as Tucker, JA (1985), point out that before beginning this assessing step, the proposed curriculum should be well designed to be taught to students while establishing different pedagogical methods that would allow better teaching experience (199-204).

Obviously, the realization of this step requires an absolute mastery of the content to be addressed. Rigorous knowledge of the academic program is a trigger, no doubt, for the development of a successful control, the application of assessment procedures and making good decisions (Fuchs & Fuchs, 1986; Howell, 1986; Shinn & Hubbard, 1992; Shulman, 1986). That said, the assessment of both formative and cumulative curriculums implies its usefulness in meeting or satisfying social needs. The educational objectives would then be achievable and measurable under the prevailing circumstances of being “realistic”. In other words, it must be possible to somehow determine if they can be achieved. On the other side, a program or curriculum should be compatible with the educational philosophy contained in the applicable laws, with a specific and sufficient guidebook to ensure that everyone’s efforts contribute to the same set goals. Therefore, there is a rapport between degree and type of average development of the student at the biological, psychological and cultural level.

It is also worth to mention the importance of responding to the needs and impacts of learners and individuals. There should be complete coherence between all parts of any program or curriculum; this implies – supposed – that each of these parts has an internal coherence. The selected content is an essential element that must be relevant because:

- It contributes to the student’s training and,
- The achievement of the learning threshold should be significant enough to allow learners to integrate – in a coherent way – the knowledge acquired to their material and intellectual reality.

Planning Objectives

The planning of a course based on determined notions in a specific program highlights the importance of progressing a process that establishes an order in learning, a full path of points and obligatory passages. This progress is essential to determine the precise sequence of teaching-learning stages, so as to avoid stacking and juxtaposing notions (Terminology of Education – BO No 35 of September 17, 1992, p.2484, quoted by Musial and Pradere, 2012). In this sense, it is worth to mention that a series of objectives – that represent the

importance of links between the gaps and the results, while guiding towards the choice of the content, the pedagogical methodologies and the assessment process to follow – is required and is determined as below:

1. Increase the effectiveness of teaching,
2. Ensure good control of education,
3. Avoid improvisations because they confuse the learner,
4. To follow up and progressively schoolwork,
5. Devote greater attention to the essential aspects of the subject,
6. Propose homework according to the available time,
7. Propose appropriate tasks according to the possibilities of the students,
8. Facilitate the coordination of different disciplines to achieve integrated education, and
9. Demonstrate an attitude of responsibility and respect towards learners, as the approach is the best evidence of the teacher's preparation for his/her task within the class.

Keys for a Successful Lesson Plan

The course plan has an annual work including an interdisciplinary outline of all subjects. That said, we should rely on essential elements formulated according to a certain number of causes; which allows the approach to be developed accordingly to the organization of the elements or factors in question. For example: 1) The objectives of a certain discipline are aligned with those of the educational institution; 2) the hours available for teaching the discipline; 3) the minimum program or curriculum to be developed, including themes or units selected on the basis of their fundamental and current aspects, their functioning, their social value and their theoretical and practical capacities; 4) the particular environmental conditions; 5) the academic level of learners; 6) if the subject has linear progress, in other words, what has been studied last year and what should be studied in the current year; 7) available teaching resources and materials that can be done and prepared by students, 8) motivation and experiences to be shared for the launch of the works; 9) extracurricular activities related to the discipline; 10) the work done; and 11) the bibliography without forgetting to add general information to be considered at the institutional level. At the planning stage, it is essential to indicate the program units and the number of corresponding sessions according to their significance and importance; describe the units according to their depts as well as the time allowed for their completion, and identify if the approach of the work could be in relation with other disciplines.

Specific Learning Objectives

These goals are considered the most laborious part because they include outcomes and thematic content. To establish them, Bloom (1975) revised by Krathwohl (2003), indicates – according to his taxonomy divided into three domains: cognitive, affective and psychomotor – that it is necessary to specify the type of activity to be accepted as a sign of completion of the objective; to define the desired behavior considering the important conditions under which it is supposed to be realized; and to specify the acceptable performance criteria. This division helps the course designer to check the scope of what he offers to students (Saint-Onge (1992), Legendre (1993)). It should be noted that most of the planning schemes of a course that have emerged from the systematization of the teaching-learning process, set in motion a closed model that should be reformed from the outset, clearly defining the objectives, topics, methodology and materials (bibliography, resources and teaching tools, etc.) as well as the evaluation system that will be used throughout the course. A model that is closed is considered rigid, even if there is a talk of flexibility when it is implemented, and the possibility of making changes in the case of maturity. On the other hand, this kind of model is seen differently if it is subjected to a through critique.

Sometimes the teacher suggests some models that are not well defined and ambiguous, which generates conflict. In this sense, learners would wonder if it is not the teacher who should plan the course especially that he is paid for it, or how would they propose topics and / or objectives if they have no idea of the subjects in question. These problems are rooted in the traditional concept of the roles of teachers and learners (who knows and does not.), but deeply raise valid questions are largely a mirror of reality. Humanistic and critical teachers plan programs while clarifying that their work remains as a proposal that could be changed after discussion.

This alternative, although well intentioned, highlights a situation of “false democracy” because learners do not really know the subject (even if they have experience or knowledge) and because planning is done before the beginning of the course. So, the themes are not yet clear and the trust between the teacher and his students is not

well established. This says that proposals or plans are rarely changed. On the other hand, on the field of practice and as a critical remark, Barnier (2009) raises the point that is the pedagogy based on objectives that makes it easier to be aware of the often-noted difference between what is proposed by the teacher to assimilate (in this case, the specific objectives or goals) and what is really happening for the learner (the operational objectives) (p.7). It is therefore necessary to develop conceptual course plan that clearly outlines some basic guidelines or principals, and, at the same time, that is an open framework in which students and teachers can move freely to build an intelligent, critical and open dialogue process.

Assessment Process

Assessment is a judgement of merit as defined by Ebel (1979), sometimes based only on measures such as those provided by the test results, but more often involving the synthesis of various measures, critical incidents, subjective impressions and other types of evidence (1-14, 18-31). However, when it comes to making decisions about student performance, the effectiveness of the educational program and the environment or the whole process, it is necessary to: (a) identify and formulate objectives; (b) select and design tools to measure progress towards the achievement of pre-established objectives; (c) use different instruments to quantify, and thus (d) make judgements based on the results achieved. From this, the assessment process is considered a very difficult step, because it should not only include quantitative data but also qualitative elements. Therefore, even if takes into consideration the student's numerical and official accreditation, it should also promote a serious, continuous and qualitative assessment at the individual or collective level.

During this process, the center of balance is represented by the learner at different times, beginning by knowing (a) whether she/he is attentive, in other words, to what extent is it possible to pay attention to reality and under what level of quality, adequacy and relevance can obtain the necessary data for the realization of her/his work; (b) if she/he understands that is, once he has assimilated the information, understood the basic concepts and themes of the course, she/he could in theory – formulate all the content in his own language (Deschenes, 1995; p. 119); (c) if her/his intellectual capacity allows to formulate a judgment that makes it possible to know and determine whether she/he can ask, seek reasons, justify opinions, provide evidence, seek examples of pros and cons, etc; and, (d) what attitudes are derived from what she/he was able to discover during her/his learning, whether her/his values are questioned as well as those of the society in which she/he lives, whether she/he is able to make her/his own decisions and so on (Duffy & Jonassen, 1992).

Considering the four levels above, an assessment process could be established, which should be varied, creative and participatory. It should be noted, then, that analysis and reflection activities or personal contributions are more useful than exams themselves. However, it should be ensured that the tests do not only have questions of memory but also those related to levels b, c and d. In this sense, different authors like Hopkins (1990) emphasize that when the assessment is formulated in terms of conscious and intentional activities, it is common to say that it is subjective because it cannot qualify the way of thinking of each person: (101). However, two questions are emerging: Are there really adequate procedures to evaluate or certify knowledge? How objective are objective tests? All this, although it is impossible to measure what someone thinks (content), it is possible to see how they think (method, skills, etc.); and while it is impossible to qualify values, it is possible to observe and evaluate attitudes, questions of discussion, evaluation, etc. that reflect existing values.

Pedagogical Planning

One session is, according to Graça and Preira (2009), a certain period lived between the teacher and the student in which the activities have a sense of direction that aim to achieve some of the predetermined objectives; thus, the role of the teacher would be to plan, manage, provide materials, and establish standards and guidelines that create a supportive learning environment and thus achieve previously established goals. In the field of foreign languages, for example, the syllabus is a project activity – if we see it in this way – that according to the authors Garça and Preira (2009), indicates the elements and concrete methods that enrich the content of a subject. Yet, this project is determined by the duration, space and characteristics of the course. Its implementation does not really require the teacher to follow step by step all the planning details, but it would be like a guide that facilitates the Process of Teaching and Learning.

Particularly, the teacher has the duty to develop the class plans adapting all the activities needed to achieve a better integration and involvement of his students into their learning process and improving the interaction's

environment. Defining a class profile would be an asset. The class plan should be enriched, according to Musial, Pradère and Tricot (2012), with a specific approach to determine the learning goals. It must have a beginning, a middle and a clear ending or conclusion. The class must be planned by the teacher himself to avoid any improvisation and to encourage reflection on the development of the main course. Each class preparation or planning involves the assessment of everything that has been seen in class. Therefore, it serves as a mean of meditation for the teacher on his work already done and what remains to be achieved.

Guidelines for Planning

According to Fink (2005, Dessaing, 1995, p.169), the important elements to consider are the following:

1. Specific objectives, to understand the description of the observable behavior of the student;
2. Motivation that consists in proposing an activity or key element to have the attention and the interest of the group towards a specific subject;
3. Subject or if it is indicated the content that will be developed in progress;
4. Procedures of instruction, i-e-d, identification of learning activities to be implemented in the classroom;
5. Duty, while specifying what the student will do in class or outside to achieve the expected learning;
6. Verification of learning (Martens et al 1994, Dessaint 1995). It indicates how the achievement of the objectives will be evaluated (Landry, 1986, Dessaint, (1995), 7) Bibliographic references. Understand the sources from which additional information will be obtained;
7. The need to determine the educational resources that will be essential (equipment or teaching material), how the new theme will be integrated with the activities already treated as well as the time required for each step. To precede the evaluation of sessions, it is essential that the teacher makes critical remarks in the same planning in order to achieve improvement as each approach progresses.

Before starting to think about the subject and activities of the day, the teacher should make, as the first moment of planning, a critical review of how the is the group if students to know at what stage the general process is. This provides feedback regarding the group when needed to effectively prevent needs and anything that might be of benefit to students. Mainly, the revision should be done on the variable of the overall course planning, which are as follows:

1. Pay attention: what is the status of the group according to its academic ability to pay attention? What kind of activities would help students focus better in the classroom and how to move in between smoothly?
2. Understand: what is the situation of the group towards the understanding of the basic elements of the subjects? What should be reinforced and how? On what basis could we advance? What activities or means would help to reach a better understanding of concepts and how to integrate them systematically? Etc.
3. Judgement: How is the group when it comes to critical thinking? What is the level of the discussion, the quality of the questions, the depth of the arguments, the validity of the statements? Etc
4. Evaluate/Decide: How are the ethical implications of what is discussed in the classroom? How does the group advance in its deliberation process? How are decisions made and what attitudes should be strengthened? Etc.

Now, after this reflection, the teacher could start planning. However, are we planning based on the theme of the day according to the objective to be achieved, for example from a “movie or material any other material available”, or it depends on the mood we are experiencing? A flexible process should consider a lesson plan based on clear and specific goals. A general planning template could be as indicated in the chart below:

Chart. Lesson Plan Matrix						
Course:			Topic:			
Date:						
Group:						
	Objectif	Activity	Time	Evaluation	What?	How?
Be attentive – Close attention						
Judgement						
Assess / Improvement						

Planning a Test/Quiz/Exam

The first essential thing in this case is to plan the quizzes carefully. That said, if proper planning is not followed, such a test would probably have little validity in its results to be measured. First, we should decide what we really want to evaluate. Do we want – for example – to evaluate the cognitive learning that our students have acquired? And if so, is it then to evaluate only low-level cognitive learning (recognized as Bloom's Taxonomy of Learning Objectives) or to assess one of the highest levels of cognitive learning (the ones Bloom calls: Comprehension, Application, Application, Analysis, Synthesis and Evaluation)? In addition to cognitive learning, could we also assess students' emotional learning? And if so, what are the desirable levels to evaluate? (Receiving, responding, valuing, organizing or characterizing – according to the Taxonomy of Educational objectives) or evaluating students' psychomotor development, coordination, etc.... perhaps the intention is to want to measure the academic success or the interest of the students or their aptitude or a combination of these? It is important then for the teacher to be clear in his mind what he would like to evaluate, because if he does not, he can easily end up with a test that has little validity.

Being well aware of the objectives of a test will help the teacher to build valid exams. The consultation of basic rhetorical references as for example the Taxonomy of Educational Objectives and the way of how learning is divided into different types and levels, should also enable the teacher to better build tests. When the course outcomes are well developed, the task of deciding the content of any test remains relatively simple. After deciding which types and levels of learning to evaluate, it is time to list the general themes or areas of interest, such as certain teaching units; chapters of a book; perhaps the analysis of a play, a book, an opera or a painting; the main topics or sub-topics listed on the lesson plan, etc. It is probably advisable not to list more than four or five topics to cover in one test (Collings, Johansen and Johnson 1969; p. 81-82).

Now, it's time to choose the type or types of the exam's questions that are convenient. This means for example, multiple choices, true or false or association which represents the recommended option. Finally, it is the collection of didactic tools (Garça and Pereira, 2009). An example could include textbooks, teacher's notes, exercises books, reference books, maps, globes, newspapers, magazines, pictures... etc. The list could be endless depending on the course, type of test and creativity of the teacher. Some of these mentioned steps can be done mentally. This is particularly applicable for more experienced teachers or for those who have taught the same course many times. The key is to know how to specifically plan the educational content.

Conclusion

After all what has been mentioned, a fundamental part of this process requires that – in the first instance – the evaluator clearly identifies the learning objectives established in the curriculum. This implies a well located in one of the existing taxonomies or classifications that serve as a basic repository. This process needs active teaching, which motivates students instead of keeping in them in a passive behavior, imitating and receiving all that has already been done and prepared. It is a daily practical teaching accompanied by an objective reflection, allowing to personally create a way of planning and assessing that is realistic, practical, complete and honest. A way that focuses more on human beings than on content, objectives and certifications, having a shared vision and a conscience of professional ethics

Recommended Readings

Joint Committee on Standards for Educational Evaluations. The Program Evaluation Standards. How to Assess Evaluations of Educational Programs, 2a, ed., Sage, USA 1994

This book proposes a standard set of standards for evaluating educational programs. These standards are the result of the work of 16 professional associations, which have been tasked with evaluating various educational program evaluation systems in the United States. This work culminated in the issuance of a document – March 15, 1994 – aimed to identifying evaluation principals that promote better program evaluation. In this book, the reader can find a detailed description of standards grouped into four categories: utility, viability, ethics and accuracy.

Isaac, S. and W. Michael, *Handbook in Research and Evaluation. A Collection of Principles, Methods, and Strategies in Planning, Design and Evaluation of Studies in Education and Behavioral Sciences*, 3a. ed., EdITS, USA, 1995.

This manual provides the evaluator with a good compilation of principals, methods and strategies for planning, design and evaluation studies in the fields of education and behavioral sciences. It presents the basic methodological concepts in a clear and brief way, while explaining the advantages and disadvantages of each method of investigation and evaluation of each model. Although the reader understands different types of methods, places special emphasis on the application of statistical techniques for measuring and analyzing data.

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References

- Barnier G. (2009). Théories de l'apprentissage et pratiques d'enseignement. Le Cahier du FLE (11 aout 2009) :7 <http://www.ac-nice.fr/iencagnes/file/peda/general/Theories_apprentissage.pdf>
- Bloom, B.S. (1975). Taxonomía de los objetivos de la educación: la clasificación de las metas educacionales. (Taxonomie des objectifs pédagogiques : la classification des objectifs éducatif). Buenos Aires: El Ateneo.
- Collins, Harold W., Johansen John H., Johnson James, A. (1969) Educational Measurement and Evaluation (p.81-82). Northern Illinois University, De Kalb, Illinois. Scott, Foresman and Company.
- Deschênes, A.-J. (1991a). Autonomie et enseignement à distance. *Revue Canadienne pour l'éducation des adultes*. V (1), 32-54.
- Deschênes, A.-J. (1991b). La lecture : une activité stratégique. *Les entretiens Nathan*. (Pp. 29-49). Paris : Nathan.
- Deschênes, A.-J. (1993). La planification de l'apprentissage dans une activité de formation à distance. Sainte-Foy, Québec : Télé-université.
- Deschênes, A.-J. (1995). Vers un modèle constructiviste de la production des textes in J.-Y Boyer, J.-P. Dionne et P. Raymond (dir.). *La production de texte*. (Pp. 101-150). Montréal, Les éditions Logiques.
- Deschênes, A.-J., Bilodeau, H., Bourdages, L., Dionne, M., Gané, P., Lebel, C., et Rada-Donath, A. (1996). Constructivisme et formation à distance. *Distances*. 1(1), 9-25
- Deschênes, A.-J., Bourdages, L., Lebel, C., et Michaud, B. (1989a). Activités d'apprentissage et acquisition de connaissances à l'aide de documents écrits. *Revue québécoise de psychologie*. 10(3), 4- 19.
- Deschênes, A.-J., Bourdages, L., Lebel, C., et Michaud, B. (1990a). Activités d'apprentissage en enseignement à distance. *Revue Canadienne pour l'éducation des adultes*, IV (2), 25-46.
- Deschênes, A.-J., Bourdages, L., Lebel, C., et Michaud, B. (1990b). Des activités cognitives et métacognitives conçues pour développer la distance. *Canadian Journal of Educational Communication*, 19(2), 87-105.
- Deschênes, A.-J., Bourdages, L., Lebel, C., et Michaud, B. (1993a). Quelques principes pour concevoir et évaluer des activités d'apprentissage en formation à distance. *Revue Canadienne de l'Éducation*, 18(4), 335-348.
- Deschênes, A.-J., Bourdages, L., Lebel, C., et Michaud, B. (1988). À propos des activités d'apprentissage pour faciliter l'acquisition de connaissances à l'aide de documents écrits. *Journal of Distance Education*, III (2), 97-114.
- Deschênes, A.-J., Bourdages, L., Lebel, C., et Michaud, B. (1992). Les activités d'apprentissage dans des cours conçus pour l'enseignement à distance, *Journal of Distance Education*, VII (1), 53-81.
- Dessaint, M.-P. (1995). Au cœur de l'apprentissage : les objectifs et les activités. In M.-P. Dessaint (Ed.), *La conception de cours : Guide de planification et de rédaction*. (Pp. 141-203), Sainte-Foy (Canada) : Presses de l'Université du Québec.
- Duffy, T.M., et Jonassen, D.H. (1992). Constructive criticisms. In T. M. Duffy et D. H. Jonassen (Eds.), *Constructivism and the Technology of Instruction: A Conversation*. (pp. 183-204), Hillsdale, New Jersey : Lawrence Erlbaum Associates.

- Durkheim, E. (1990). *L'évolution pédagogique en France*. Paris, PUF-Quadrige, 1990, p.16
- Ebel, R.L. (1979). *Essentials of educational measurement* (3rd ed.) Englewood Cliffs, NJ: Prentice-Hall.
- Fink, D.L. (2005). *Creating significant learning experiences: An integrated approach to designing college courses*. San Francisco: Jossey-Bass. <http://www.crlt.umich.edu/gsis/p2_5>
- Fuchs, L.S., & Fuchs, D. (1986). Linking assessment to instructional interventions: An overview. *School Psychology Review*, 15(3), 318-23
- Graça, L. & Álvares, L. P., Le rôle des outils didactiques dans la construction de l'objet enseigné : le cas d'une séquence didactique du texte d'opinion, *Travail et formation en éducation* [En ligne], 3 | 2009, mis en ligne le 18 décembre 2009, consulté le 29 septembre 2016. URL : <http://tfe.revues.org/839>
- Hopkins, C.D., & Antes, R.L. (1990). *Classroom measurement and evaluation*. 3rd edition, (29-131)
- Howell, K.W. (1986). Direct assessment of academic performance. *School Psychology Review*, 15(3), 324-35
- Krathwohl, D.R. (2002). A Revision of Bloom's Taxonomy, An Overview. *Theory into Practice*, 41(4), pp. 212-218.
- Lafortune, I., & Bélanger, K. (2008). Exercer un jugement professionnel dans l'action : des résultats de recherche québécois qui ouvrent des évaluations (pp. 37-78). Montréal : les Presses de l'université du Québec.
- Laurier, M.d., Tousignant, R., & Morissette, D. (2005). *Les principes de la mesure et de l'évaluation des apprentissages* (3e éd.). Montréal : Gaëtan Morin
- Landry, F. (1985). L'imprimé, un moyen d'enseignement privilégié. In F. Henri et A. Kaye (Éds.). *Le savoir à domicile*, (pp. 209-259). Sainte-Foy, QC : Presses de l'Université du Québec.
- Landry, F. (1986). *Revue de littérature sur le rôle des activités d'apprentissage dans l'enseignement à distance*. Sainte-Foy, QC : Télé-Université.
- Legendre, R. (1993). *Dictionnaire actuel de l'éducation*. (2e éd.). Montréal : Guérin, Éditeur
- Leinhardt, G., Greeno, J.C. (1986). The cognitive skill of teaching. *Journal of Educational Psychology* (78), 75-95.
- Lewy, A. (1976), cité par J.A. Arnaz *Naturaleza de la evaluación del currículo*, (Nature de l'évaluation des programmes d'études), En B.S. Bloom [Ed.]. *Manual de Evaluación Formativa del Currículo*. (Manuel de l'évaluation formative du programme d'études), Bogotá, Colombia: Voluntad- UNESCO.
- Lonergan, Bernard (1978), *Insight - Méthode en théologie*, Herder, New York.
- Martens, R.L., Portier, S.J., et Valcke, M.M.A. (1994). The use of embedded support devices in interactive learning environments: The impact of University, Centre for Educational Technology and Innovation.
- Martens, R.L., et Valcke, M.M.A. (1993). Validation of a theory about the functions and effects of embedded support devices in written study materials. In F. Lockwood et M. Valcke (Eds.). *New developments in research in relation to distance education materials*, (pp. 65-84). Heerleen, The Netherlands: Open University of the Netherlands, Centre for Educational Technology and Innovation.
- Musial, M., Pradère, F., & Tricot, A. (2012). *Comment concevoir un enseignement ?* Bruxelles : De Boeck.
<http://web.actoulouse.fr/automne_modules_files/standard/public/p8841_7df1734085d4d5e613a84f131ed0198ePlanification.pdf>
- Ohlsson, S., & Rees E. (1991). The function of conceptual understanding in the learning of arithmetic procedures. *Cognition and Instruction*, 8(2), 103-179.
- Paulo Freire, (1972). *Pedagogy of the Oppressed*. Continuum, New York 1990. P 67.
- Saint-Onge, M. (1992). Les objectifs pédagogiques : pour ou contre ? *Pédagogie collégiale*. 6 (2), 23-28
- Shinn, M.R., & Hubbard, D.D. (1992). Curriculum-based measurement and problem-solving assessment: Basic procedures and outcomes. *Focus on Exceptional Children*, 24(5), 1-20.
- Shulman, L.S. (1986). Paradigms and research programs in the study of teaching: A contemporary perspective. In M.C. Wittrock (Ed.), *Handbook of Research on Teaching* (3rd Ed.) New York: Macmillan.
- Tousignant, R. (1982). *Les principes de la mesure et de l'évaluation*. Montréal: Guérin.
- Trahan, M., Tucker, J.A. (1985). Curriculum-based assessment: An introduction. *Exceptional Children*, 52, p.199-204
- Thorndike, E.L. (1917). *Education: A first Book*. New York: Macmillan.
- Thorndike, R.L., & Hagan, E. (1969). *Measurement and Evaluation in Psychology and Education* (3rd ed.). New York: Wiley.
- Valencia, S. (1990). A portfolio approach to classroom reading assessment: The whys, whats, and hows (assessment). *Reading Teacher*, 43(4), 338-40

Pilot Research of Teacher Placement: Are Industry and STEM Classroom Different Learning Environments?

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Abstract: The rapidly changing modern world is creating new demands in the workplace. This connected with challenges in educating young people. Teachers are called to provide high quality teaching and learning methodologies so that young people can develop knowledge, skills and attitudes to be able to transfer safely into the world of work. This article describes the objectives and the results of the pilot participatory research with my placement in the food industry as a unique professional development opportunity that links the classroom to the workplace. Through the data collected and analyzed from active participation in tasks, services or activities in the workplace and interviews with different sections of the food industry, this article analyzes the similarities and differences in industry with classroom instruction. The main result of this paper is that such teacher placements increase the teacher's ability to link theory and practice with the proper planning of learning and teaching activities, understanding of workplace practices (e.g. problem solving methods, practical applications of theory) the importance of student learning. This completely and comprehensive view of occupational tasks needed in industry, provide as proposals innovative teaching methodologies and evaluation form based on the activities and tasks performed into industry in relation with required skills.

Keywords: Teacher placement, Industry, Knowledge, Skills, Attitudes

Introduction

A series of global labor force studies and consulting shows that a significant proportion of employers have difficult to find candidates to fill their vacancies (European Commission (EU), 2015; EU 2014; EU 2013; Dobson, 2013). The rapidly evolving economies and revolution in the world of knowledge and information, which is also termed the fourth industrial revolution, highlight the urgent need to prepare young people to be capable of responding to all these changes (World Economic Forum, 2016; Arntz et.al, 2016). By 2022, the skills required to perform most jobs will have changed significantly. Skills being developed include analytical thinking and active learning, as well as digital skills. However, the adequacy of new technologies is only one part of the 2022 skill equation. Human skills such as creativity, originality and initiative, critical thinking, persuasion and negotiation will maintain or increase their value as well attention to detail, resilience, flexibility and complex problem solving. In that ways, as our economy and society change, education will be even more important than ever for jobs, prosperity and social inclusion. The role of education is critical to equip young with knowledge, skills and attitudes in order to find a quality job position (OECD, 2019; Toner, 2011; Gray, 2016).

Stakeholders and educational policies promote the development of school and industry partnerships (Gonski et al., 2018). The common goal in many European Countries is to develop closer cooperation or partnership with industry with expanded trend to include not only in vocational schools, but also in general education systems (EU, 2016). However, there are certain system-wide exclusion mechanisms and obstacles such as i) the lack of time to prioritize school-industry partnerships among other priorities in schools ii) the delivery of the national curriculum iii) structural barriers iv) procurement policies and child safety requirements (Torii, 2018). The emergence of these new relationships between education and industry has highlighted the need to examine and attempt to identify teachers' work. The current challenges in education focus on teachers' ability to make these links between education and industry (Perry & Ball, 1998). The teachers could have a central role not only to better understand industry needs and expectations but also to transfer workplace-related skills and competencies to their work with students. Under this framework, this article examines the results of teacher participating in a short-term placement in a food industry and analyzing the additional values in teacher professional development.

Teacher Placement in Industry as Force of Professional Development

Schools are learning organizations that need to be connected and integrated within an educational system where decision-makers can learn from developments in and around schools. In addition, they should encourage and facilitate teachers and school leaders to simultaneously improve both their pedagogical and organizational practices through local collaborative research, networking and continuous professional development (European Commission, 2017a; Lepani, 1993, National Industry Education Forum, 1993). The continuous professional development of teachers strengthens their position and key role in the transmission of knowledge and shared values and in the provision. The most common forms of professional development are participation in conferences and workshops (Stone, Kowske, & Alfeld, 2004). However, such activities are discouraged, as they are not effective and productive strategies to ensure that teachers remain up-to-date with all aspects of current developments. On the contrary, internship programs that provide workplace experiences are preferred (Perkins, 2006; cited in Geralyn, 2011).

Moreover, the main task of teachers needs to be redefined, as there are often misunderstandings between the work associated with the role of teacher as educator and teacher as manager. Teachers are often not seen as 'working' in the same way as 'working' in industry, although teachers face similar situations to those in industry, such as restructuring awards and measuring performance outcomes. Comparisons between teachers 'work and industry expectations indicate that teachers' work may not be much different from 'industrial work' and that there may be common skills and competences, common models for the development of new knowledge products and assessment frameworks (Ashenden, 1990 cited in Perry & Ball 1998).

Under these frameworks of professional development of teachers in order to be familiar with the workplace of industry the teacher placements are an emerging educational change. STEM teacher placements in industry are work placements or internships that provide opportunities for STEM teachers to upgrade their knowledge, skills and competences in science, technology, engineering and maths, as well as to improve their teaching of STEM subjects. Teacher Discovery Placement scheme (European SchoolNet, 2017), is an initiative of the STEM Alliance¹ in collaboration with the SYSTEMIC project and it aims to assemble a significant number of relevant practices of current teacher placements, in order to highlight the diversity of existing ones. Taking under consideration the above described challenges, this pilot research focus in examination how effective could be teacher placement in industry for development the ability to understand the required knowledge, skills and attitudes that teachers have to cultivate in teaching and learning activities.

Method

The participatory observation to the food industry research, where the researcher and the educator are the same person, lasted for 40 working hours (5 days to 8 hours daily). The food industry is a state-of-the-art product manufacturing plant located in the Peloponnese with a total area of 5,200 sq.m. , with 40 employees on a daily basis. There the main product categories of the company are manufactured according to international standards, where they are exported locally and internationally. Participatory observation for data collection includes methods for generating data other than observation, such as in-depth interviews, informal discussions, the use of written evidence and, in particular, the researcher's reflection (Flick, 2006).

The observations were focused on the operating areas of the production departments, but mainly on how they were operated. Dialogues and questions with the staff of the departments supplement the observations, with the main objective of being able to obtain a complete description of its field industry, the people and the tasks that took place there. Throughout the observations and dialogue, I wrote notes that were processed and analyzed at the end of each day to draw the conclusions. Interviews with the director of the production industry and the director of the research and development department include questions on (i) analyzing the requirements skills a employee in order to undertake work in the food production industry (ii) an overview of the methods of organization and operation of the departments of industry. Their responses were checked and evaluated during my active involvement in the factory, where I was called upon to perform specific tasks under the supervision of a mentor. Finally, the collection of artifacts/ documents for (i) the objectives set by the industry each year (ii) the crisis management policies (iii) the annual employee evaluation form used are important additional elements for the research the field of industry. The most important part of the research is the reflection, that is, the processing of the data, recorded throughout the participatory observation, so that it can be interpreted within the STEM classroom and the researcher-educator draws conclusions about (i) the skills needed develop students to take an active role as employees ii) teaching methods and practices.

Results

Skills, Attitudes and Knowledge in Industry and STEM Classroom

Analyzing interviews in combination with observations of daily tasks of workers in industry and tasks that I had to achieved during my placement provided an overview of comparison skills in industry and skills in STEM classroom (see Table 1) and an overview of comparison attitudes in industry and attitudes in STEM classroom (see Table 2).

Table 1. Comparison Skills of Employees in Industry and Skills of Students in STEM Classroom

Skills of employees in food industry	Skills of students STEM classroom
"...Collaboration and interaction in teams: If employees do not work as a team not only with strong links of collaboration between them, but also with collaboration between different parts of production the daily plan of production cannot be achieved and there is a high likelihood of objectives being set down..."	-Collaboration -Team working -Social skills
"...all workers should be able to solve problems that arise unexpectedly in the daily operation of the production unit..."	-Problem solving
"...He/She should be able to describe the problem accurately, communicate and transfer information as quickly as possible to the relevant departments..."	-Communication skills -alertness to all possible situations/ strategies -Make decisions
"...It is very important that employees are aware of the goals of the industry from the start so they will be focused on what they want to achieve on a daily basis so that they can meet their time management skills..."	-Management skills -Leadership skills
"...Employees of selling department need creative thinking to be able to business executives in order to best promote company products..."	-Creative thinking
"...Employees in the production department where it combines barcodes to produce new products need detailed and concise thinking..."	-Analytical and critical thinking

Table 2. Comparison Attitudes of Employees in Industry and Attitudes of Students in STEM Classroom

Attitudes of employees in food industry	Attitudes of students in STEM classroom
"...work according to moderation and logic..." ...which explains "not to exhibit extreme behaviors, to obey the rules and standards that must apply, but not to be a passive listener..."	-Students set their curiosity in STEM environment. -Ask questions and demonstrate open-mindedness and inquisitiveness.
"...Respect for diversity / different views: He/ She should be able to respect his/her colleague, who performs different tasks than his own and has different views on how to execute and organize, but together they aim to produce a product..."	-He/She show flexibility and openness to changing strategies of problem solving, methods, opinions or goals in light of new information and changing circumstances. -He/She could work both independently and part of a team to achieve objectives of STEM subjects -Respect the diversity in a classroom -Openness to listen the views and opinions of his/her schoolmates.
"..He/She feels the workplace as his/her own ..."	-He/She feel safe in STEM classroom environment, as his/her home with the support of educator.
"... .. He/She could integrate into the framework and rules applicable in the workplace..."	Adaptability to the requirements tasks of curriculum and timetable/ daily program of STEM classroom
"... He/She has faith in what he does ..."	-Persistence to achieve the goals of each learning STEM tasks -He/She has the ability to sustain interest, effort and motivation to persevere in accomplishing a task or goal.
"...He/She becomes part of the workplace society and must comply with applicable law..."	-Individual liability to achieve the goals of his or her performance through exams or through worksheets
"...We have to work both independently and part of a team to achieve objectives of daily production..."	-Responsibility to set personal and professional goals, be accountable for actions, consider the needs of STEM subject and requirement tasks presented by educator. -Honesty to implement the rules needed in examination or daily tasks

In the framework of needed *knowledge* of employees in industry director of human department mention that “... *Industry call for employees with work experience, that’s why it is important to have training programs by up to secondary and higher education certifying their experience in the workplace...*”, “...*As we know this is not possible, so we offer professional development seminars, but the emphasis is on the practice of implementing the knowledge and not on theory....*”, “...*Employees during their training should be able to listen ... and then put into practice ...*”, “*Learning by doing*” is a key principle for the food industry to operate...” Under the same framework, teaching and learning in the STEM classroom based on the theory of education «learning by doing» and it is a hands-on approach to learning, meaning students must interact with their environment in order to adapt and teach (Dewey, 1997). The teachers faced the challenge to present real life problems to the students and then guide the students to solve the problem by providing them with a hands-on activity to learn the solution. One the hand teacher is the supervisor and the mentor is STEM classroom who support the learning process and on the other hand in food industry “...*On a daily basis the company supervises the workers as there is the responsible person in each department to provide support instructions and corrects any errors. The mentor is responsible to monitor and correct the quality performance of products...*”. In particular, teachers are responsible to prepare the young with new knowledge and the methodologies of teaching follow the models of Research and Development Department (RnD) in industry, where the new knowledge represented by the new products for future labor needs.

Research and Development Department (R&D): New Products and New Knowledge

R&D consists of the research activities that an industry or business chooses to do with the desired result of a discovery that will create either a completely new product, product range or service. R&D is not just about creating new products (knowledge) as it can be used to enhance an existing product (knowledge) or service (knowledge production process) with additional features. The comparison of expected results of of R&D in food industry and expected results of teaching in STEM school curriculum (see Table 3) give the motivation of creating common models of food production and knowledge. However, in order, R&D is an important means of achieving future growth and maintaining a relevant product in the market, it has to follow a methodological operation strategy plan. In that ways plans of R&D in industry could modify in R&D methodological plan in STEM classroom, to express the important means of achieving the future development of a student's skills and maintaining a relevant knowledge product in the relevant discipline.

Table 3. The Comparison of Expected Results of R&D in Food Industry and Expected Results of Teaching in STEM School Curriculum

Objectives and expected results of R&D in food industry	Objectives and expected results of teaching in school curriculum
Improvement of products so that they always meet the relevant legislation, consumer needs and objectives of the industry.	Developing innovative teaching methods that meet i) the legislation of curriculum in each stage, ii) the needs of each student iii) the future trends in education for preparation the young as employers in the workplace
Finding/ searching the right raw materials and packaging for the Industry's products, existing and new.	Finding the right supportive teaching materials (interactive media, digital tools for knowledge products, existing and new)
Finding new technologies, methods and processes aimed at improving the production process in collaboration with the Production and Technical Support departments.	New technologies, innovative methods inquiry learning processes aimed at improving the methodological process of new knowledge in collaboration with other disciplines in order to support the disciplinarily.

Common Model of Food Production and New Knowledge

Koberg et.al (1991) describe the ways in which new products are created starting from problem identification, which are transformed into reflection ideas and subsequently into original and ultimately innovative products. The authors suggest that all problems can benefit from the same logical process. The methodology and the steps used to solve many complex problems are: (1) Acceptance of the situation, (2) Problem analysis, (3) Goals and solutions, (4) Selection of methods, (5) Application of solution techniques and (6) Evaluation of results. In the industry when designing a new product or redesigning an existing one, it is important to clearly identify what problem it is trying to solve through this new product, namely to analyze a situation of low sales or low quality.

Through the analysis of the problem parameters, the goals and corresponding solutions will be set. It is very important to consider the client and his requirements and desires from the beginning to the end of the product, in order to properly choose the method of implementing the implementation strategies. Finally, a critical and detailed view of the process needs to be taken, with the necessary changes to be made. With this approach and mindset, creating successful product designs will become a more systematic process and the resulting products will have a long-term impact on consumers. Can this plan be adapted and applied to the teaching of the lessons? The answer is that since this model works to solve all problems, it could perhaps also be adapted to study the problems of today's society, so that students can study and understand important problems in today's world, find solutions, and to recognize the connection of science.

The example of teaching and learning about the problem of climate change illustrates the pilot model that could be applied to both the food industry and the STEM classroom. (1) Students are invited to discuss problems recorded in the environment (average global warming, ice melting, rising sea levels) through pictures, figures, graphs, videos, etc. (2) The analysis of the problem of climate change is to investigate the causes (eg increase of pollutants in the atmosphere). (3) Students are encouraged to think creatively to propose innovative solutions to the problem, always taking into account the human factor and improving the quality of his life without risk to his health.. (4) Alternative energy sources (wind, geothermal, nuclear, etc.) may be a method to limit air pollution. (5) The use of digital tools can be used to understand the implementation of problem-solving strategies. (eg the digital tool <http://www.wwf.gr/footprint/> will suggest implementation methods and techniques) (6) At the end of the learning process students evaluate the process through questionnaires with five choice scales: 1 (strongly agree), 2 (agree), 3 (n / a), 4 (disagree), 5 (strongly disagree). Questions may include: i) The importance of the results of knowledge about the climate change scenario for their daily lives, ii) the positive and negative aspects of the teacher script, iii) the impact on students' attitudes and knowledge.

Evaluation Form of Employees in Food Industry as Evaluation Tool to STEM Classroom

Both the evaluation of employees' performance and students' performance has a significant role and meaning in the quality of production and knowledge (see Table 4).

Table 4. Employees' Evaluation Form of the Food Industry

	Not satisfactory Grade 1	Moderate Grade 2	Good Grade 3	Very good Grade 4
Quantity of work Accuracy, completeness, regularity, diligence, consistency, dedication to work, avoidance of mistakes.				
Quality of work -complete work in time -willingness to do work and help colleagues -presents samples of planting, indifference and fatigue				
Abilities -analytical and combinational thinking -easily adapted to the requirements of the job -makes quick and right decisions -takes initiative, is innovative is responsible, reliable, caring				
Conduct cooperative, kind, communicative, trustworthy, faithful to principles and goals				
Work habits -He makes good use of the means provided to him/her -Observes procedures and forms -It follows the rules and respects them -Misconduct penalties? -Keeping a schedule - unjustified absences -Comply with hygiene and safety rules				
Evaluability -He/ she has the ability to improve -Are there personal goals to be achieved?				

The results of those evaluation procedures could be taken under consideration in the model of production. It is critical the definition of evaluation criteria, that's why the evaluation form of the food industry is suggested to be used as analytical evaluation form, as describes many components of learning process. This evaluation form could be a useful tool for teacher because it includes attitudes and skills of students' performance. The result is the average score= sum of grade in each line divided with 7. It is very important that this form completed by comments of the employee and the directors of each department in industry and after discussion they set goals for the next period. This strategy of evaluation could have additional pedagogical value in educational systems, because each student is a personality who needs personal suggestions for development skills and attitudes and not only grades for evaluation the knowledge.

Conclusion

In this pilot research, the educational goal was to increase the ability of the teacher to link theory and practice to convey through appropriate designed learning and teaching activities an understanding of workplace practices (eg problem solving methods, practical applications of theory) in the classroom, thereby increasing the importance of student learning. Conversely, teacher involvement in industry activities could examine how classroom strategies and content can be applied in the workplace. The educator and researcher gained a complete and comprehensive view of occupational choices, labor market needs, activities and tasks performed, skills requirements, career development scales, standards, problems encountered and opportunities student learning in a targeted industry or career space. Mostly, as basic output is that the teacher and researcher translates this learning into an enhanced, integrated curriculum, teaching methods, work-based learning opportunities for students and evaluation form.

Acknowledgements

The STEM Alliance (www.stemalliance.eu) is an industry-education cooperation initiative coordinated by European Schoolnet and CSR Europe which aims is to promote Science, Technology, Engineering and Maths education and careers to young Europeans and address anticipated future skills gaps within the European Union. The STEM Alliance has published the "Teacher Placement Initiatives – Collection of Best Practices" booklet, containing a selection of 15 initiatives collected from 10 countries around the world, providing inspiring examples of STEM teacher placements in industry. One of the main aims of this "Teacher Placement Initiatives – Collection of Best Practices" is to help overcome the lack of awareness of career development opportunities for teachers, taking into consideration the urgent need to bridge employment gaps by sustaining cooperation between school and industries. The publication contains precious insights for industry on how to attract new generations of students into STEM careers while understanding the workforce available, allowing a tailored targeting of specific candidates (Retrieved from <http://www.stemalliance.eu/documents/99712/104016/TDS+-+Collection+of+Best+Practices/7cfbadca-ae34-4be2-9866-5218efae5be8>)

Following the 'Teacher Placement Initiatives – Collection of Best Practices', the guide has been created by a team of education and corporate experts for businesses that are committed to championing and promoting education and employability in science, technology, engineering and maths (STEM). The guide is addressed to those in charge of different types of departments, including Human Resources, Communication, Corporate Social Responsibility (CSR), Outreach or Community Activities, and Education or Training. This publication constitutes the second part of the Intellectual Output 4 'Guide on contextualization of STEM teaching' of the SYSTEMIC project. SYSTEMIC is funded by the Erasmus+ Programme of the European Union. This publication includes guidelines and conditions of success for this type of school/industry collaboration and some analysis on how teacher placements contribute to improve teachers' STEM skills and their capacity to influence students' studies and career choices.

Another European initiate is the DESCi European project (www.desci.eu/) (Valente et.al), which aims to improve the capacity of secondary school to prepare students, intercepting the needs of the labor market, and encourage the development of a European working methodology in secondary schools to ensure equal quality standards, at European level, in the management of the alternating training. DESCi is focused on the improvement of European methodological standards of alternating training in secondary technical and professional School system, through the development, at European level, of a kit of methodological tools for teachers, students and tutors. As part of outputs of Desci Project, re-search team of National Kapodistrian University of Athens analyzed the term of 'alternating training' as an umbrella term, that incorporates all forms

of education or training, combining periods in an educational institution or training center and in the workplace. Finally, this pilot research will be included in the methodology plan of PhD thesis “Connecting Education with workplaces for development skills” using further data of qualitative analysis both in workplaces and in STEM classrooms.

References

- Arntz, M., T. Gregory and U. Zierahn (2016). *The Risk of Automation for Jobs in OECD Countries: A Comparative Analysis*. OECD Social, Employment and Migration Working Papers, No. 189, OECD Publishing, Paris, <https://doi.org/10.1787/5jlz9h56dvq7-en>.
- Ashenden, D. (1990) *Award restructuring and productivity in the future of schooling*. VIER Bulletin, 64, pp. 3-32.
- European Commission (2015). Joint Report of the Council and the Commission on the implementation of the strategic framework for European cooperation in education and training (ET 2020) — New priorities for European cooperation in education and training.
- European Commission (2014): *Mapping and analysing bottleneck vacancies in EU labor markets*. European Commission, Brussels.
- European Commission/EACEA/Eurydice, 2013. *Education and Training in Europe 2020: Responses from the EU Member States*. Eurydice Report. Brussels: doi:10.2797/49490 Eurydice. Retrieved from <http://eacea.ec.europa.eu/education/eurydice>
- European Commission (2016). *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions Improving and Modernizing Education*. Brussels, Belgium. COM/2016/0941.
- European Commission (2017a). *Teachers and school leaders in schools as learning organisations: guiding principles for policy development in school education*. Brussels, Directorate-General for Education and Culture.
- European Schoolnet (2017) *Teacher placement initiatives - Collection of best practices*, Brussels, Belgium.
- Gonski, D., Arcus, T., Boston, K., Gould, V., Johnson, W., O'Brien, L., Perry, L-A., Roberts, M. (2018). *Through Growth to Achievement: the Report of the Review to Achieve Educational Excellence in Australian Schools*. Retrieved from https://docs.education.gov.au/system/files/doc/other/662684_tgta_accessible_final_0.pdf
- Gray, A. (2016). *The 10 skills you need to thrive in the Fourth Industrial Revolution*. Retrieved from <https://www.weforum.org/agenda/2016/01/the-10-skills-you-need-to-thrive-in-the-fourth-industrial-revolution/>
- Dewey, J. (1997b). *Experience and education*. New York: Simon & Schuster Inc. (Original work published 1938)
- Dobson, I. (2013): *STEM; Country Comparisons –Europe. A critical examination of existing solutions to the STEM skills shortage in comparable countries*. Australian Council of Learned Academies, Melbourne.
- Flick, U. (2006). *An Introduction to qualitative research (3rd ed.)*. London: Sage Publication.
- Geralyn E., S. (2011) Teacher Internships as Professional Development in Career & Technical Education. *Journal of Career and Technical Education, Vol. 26, No. 2*.
- Lepani, B. (1993) *Teacher Professional Development beyond 2000*. National Industry Education Forum. Melbourne.
- Perkins C. Career and Technical Education Act of 2006 (Public Law 109-270). Retrieved from <https://www.govinfo.gov/content/pkg/BILLS-109s250enr/pdf/BILLS-109s250enr.pdf>
- Perry, C., Ball, I (1998) What do teachers really know about work? Professional development through education-industry links. *Teacher Development, 2:1*, 73-86. <https://doi.org/10.1080/13664539800200038>
- OECD (2019). *OECD Skills Strategy 2019: Skills to Shape a Better Future*. OECD Publishing, Paris. <https://doi.org/10.1787/9789264313835-en>
- OECD (2019). *Teachers and School Leaders as Lifelong Learners*. TALIS Results (Volume I): OECD Publishing. doi: 10.1787/1d0bc92a-en
- National Industry Education Forum, (1993) *Connections: a project of national significance examining links between business and industry and the school sector*. Carlton: Curriculum Corporation.
- Stone III, J. R., Kowske, B. J., Alfeld, C. (2004). Career and Technical Education in the Late 1990s: A Descriptive Study. *Journal of Vocational Education, (29), (3)*, 195-223.
- Toner, P. (2011). Workforce Skills and Innovation: An Overview of Major Themes in the Literature", OECD Science. *Technology and Industry Working Papers, No. 2011/01*. OECD Publishing, Paris, <https://doi.org/10.1787/5kgkdgdgc8tl-en>

- Torii, K. (2018). *Connecting the worlds of learning and work: Prioritising school-industry partnerships in Australia's education system*. Mitchell Institute, Melbourne. Retrieved from www.mitchellinstitute.org.au
- Valente, A., Tudisca, V., Pennacchiotti, C., Smyrniou, Z. Kotsari, K. Mon-sonís-Payá, I., Garcés, J., Branchini, B., Ricci, F. and The DESCi Consortium (2018). *Actors and Practices in Living Lab for Alternating Training*. In *“Responsible Research and Innovation Actions in Science Education, Gender and Ethics - Cases and Experiences”*. SpringerBriefs in Research and Innovation Governance, pp. 27-33.
- World Economic Forum. (2016). *The future of jobs employment, skills and workforce strategy for the fourth industrial revolution*. Retrieved from http://www3.weforum.org/docs/WEF_Future_of_Jobs.pdf

Educational Change: The View from Within

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Abstract: The process of change and its effect is documented in this dissertation research project through the eyes of classroom teachers and the effect that the changes had on them personally, practically, and professionally. The three areas of simultaneous systemic change were: reduction of class size, technology integration, and collaborative leadership of teachers. The following research questions were explored in this study: What are the teachers' perceptions of their contribution to implement and sustain change? What intellectual and emotional work must teachers do to successfully implement and sustain change? What supports do teachers need when implementing and sustaining change? The researcher conducted interviews with each teacher following a series of constructed questions. The themes that emerged from the interviews were: (1) clarifying the proposed change and the role of the teacher in change, (2) clarifying the role of the administrator in change, (3) supporting through professional development and pacing of change, (4) building trust and team membership. The findings from this study provide valuable insight into change for teachers and administrators. The participants in this study brought to life the complexities and needs of educators embarking on change. Based on its findings, this study recommends that further investigation into teacher self-efficacy and emotional intelligence in the change process be conducted. The results of this study suggest that it is valuable for administrators to invest time in the study of the change process. The change process within a school is complex for teachers and all involved. Change is personal and change within an organization is often slow. Addressing the complexities and focusing on the needs of those involved can dramatically influence in a positive manner the experience and outcome of the change process and the culture in which it takes place.

Keywords: School change, Systemic change, Change process, Change agent

Introduction

“By definition, change is any significant alteration in the status quo that affects an individual or organization” (Bloom, 2005, p. 21). Change usually calls for an alteration in the roles and responsibilities of people. This happens whether the change is a personal change or an organizational change. Prochaska, Norcross, and DiClemente (2007) devoted years of clinical research to the stages of change, the unfolding of change, and the complexity of change due to dealing with individuals. Evans (2001) combined a psychological and systemic perspective to study change in educational settings. The research again points to the complexity of the change process. Evans (2001) states, “the success of change depends heavily on the readiness of people, the organizational capacity of schools, and the kind of leadership that is exerted” (p. 14).

Educational change in today's world is forcing itself on us at every turn, wielding both positive and negative forces. Ebbeck and Chan (2011, as cited in Ebbeck & Waniganayake, 2003) wrote, “Change is an ever-present entity and necessity for growth and to meet existing and future demands” (p. 43). The futility of school change is legendary; it is an enormous and intricate task (Evans, 2001). In order to grow and develop, the positive forces must be used to our advantage and the negative forces must be blunted (Fullan, 1993). Educational change faces a paradox: its essential agents of change—teachers and administrators—are also its targets and, sometimes, its foes (Evans, 2001). Change happens in small amounts at times and in very large waves at other times. The idea and process of educational change is surrounded by questions and increasingly by research. Schools are organizations, made up of individuals, which generate complex problems that cannot be solved by simple solutions (Bloom, 2005).

Newmann and Wehlage (1995), for the Center on Organization and Restructuring of the Schools (CORS), closely examined the process of change in schools. Researchers analyzed data from over 1,500 elementary, middle and high schools throughout the United States, and conducted field research in 44 schools in 16 states (Newmann & Wehlage, 1995). The study indicated that with successful change student learning does increase. Another strong indication from the study was the importance of vision and strong learning communities when attempting change. This research examined successful schools that were already up and running with change. The limitation of the study was that it did not reveal how the successful schools got that

way. It left unanswered questions, calling for closer examination of change and the problems associated with the change process (Newmann & Wehlage, 1995).

Louis and Kruse (1995) conducted a study on five urban schools that had been attempting reform, or change, for several years. The researchers used their backgrounds in professionalism to delve into the importance of the development of professional community during change. An outcome of this work was a framework for evaluating elements of community often used to aid in the process of change in schools. This study added to the literature on school change by again emphasizing the complex process of change (Louis & Kruse, 1995). Bryk (1998) examined the 1989 Chicago Reform Experiment using quantitative and qualitative data. Case studies of six schools actively going through change were examined combining narratives and quantitative analyses. This study resulted in an insightful picture of the decentralization of power and authority in the Chicago Reform Experiment. Bryk (1998) provides a detailed analysis with relevant application to the change process within the school. The findings illustrate how under decentralization the principal's role is recast, social support for change can grow, and ideas and information from external sources are brought to bear on school change initiatives.

Research points to the fact that change is complex and school change is no different. Fullan (1999) writes that complexity makes things "exceedingly difficult, while the answer lies within its natural dynamics" (p. 3). Fullan (1999) also states that those very same dynamics "can be designed and stimulated in the right direction but can never be controlled" (p. 3). Research has shown change to be more attainable for the teachers that are given leadership over their own growth and learning. An effective teacher makes positive change occur in the classroom (Marzano, 2003; Nye, Konstantopoulos & Hedges, 2004). The individual classroom teacher plays a pivotal role in educational change. Anderson and White (2011) revealed that helping teachers and administrators develop supportive relationships built on trust was a key ingredient to successful change. Teachers must see the overall plan for change and understand the thinking behind the plan. Change that can be linked to positive results within the classroom for students stands a much greater chance of being embraced by the classroom teacher. The ultimate purpose of educational change or reform is to benefit all students (Fullan, 1999). No matter what the overall plan for change, the individual teacher will put into play the instructional pieces that bring about the educational change for students.

Even research of educational change at the college level indicates complexity as well as the importance of the classroom instructional leader. In a study by Sin, McGuigan, and Chung (2011), reshaping, or change, of the Australian higher education system was the focus. The case study was conducted within a large and diverse department at Macquarie University. Over a two-year period, Macquarie University enacted a number of teaching and learning policies that required immediate compliance. The changes were aimed at improving the quality of teaching and student learning through enhanced staff engagement in this time of change. These change policies had direct impact on the teaching activities of faculty. The following research questions were asked:

- How does the teaching staff feel about the changes that are brought about by institutional teaching related policies?
- How does the teaching staff comply with teaching related policy requirements and changes that directly impact on their teaching activities?
- How does the teaching staff adjust to making changes in their classrooms that are directly affecting their teaching activities? (Sin, McGuigan, & Chung, 2011, p. 84)

A questionnaire was used for data collection of both quantitative and qualitative data. The questionnaire was designed intentionally with open-ended questions for individual reflection. A response rate of 30% was achieved on the questionnaire. Common themes that emerged from this research were as follows:

- Faculty felt that too many changes were implemented at a pace that was too rapid.
- Faculty felt changes were duplications or contradictions.
- Faculty felt that they were not given adequate amount of time to adjust to changes.

A very telling comment from the questionnaire stated, "I don't have much faith in policies designed by people that don't do much teaching" (p. 86). The main sources of identified stress fell into the categories of time pressure to adjust to the changes and a sense of skepticism behind aim and motivation of the changes. Findings of this study pointed to the importance in coping with change through peer support and leadership, nurturing a culture of collegiality for the change process. The researchers highlighted that teaching staff are in a critical position "where institutional change directly impacts on their teaching activities and ultimately on the quality of student learning through these activities" (Sin et al., 2011, p. 82).

Systemic change, or system-wide change, is no different. The individual classroom teacher is still the main agent of change. Systemic change is often described as a “paradigm shift” in education. It is a comprehensive approach recognizing fundamental aspects in education. This type of change requires a sophisticated strategic plan and trained personnel. Systemic change also stands a higher chance of success if it is a shared “vision” among a group of committed individuals (Fullan, 1993). Sin, McGuigan, and Chung (2011) state in their study, “one of the key strategies used by the leaders and managers of the change process was the persistent engagement of all stakeholders” (p. 83). This same study by Sin, McGuigan, and Chung (2011) identifies the importance of leadership in “nurturing collegiality in the work environment for successful change processes and outcomes” (p. 89). Change of a systemic nature is only as good as it plays out effectively in the individual teacher’s classroom, improving education for students (Adelman & Taylor, 2007).

When systemic change does play out effectively in a classroom under the watchful eye of the classroom teacher, the question becomes sustainability. Sustainability at the classroom level and the whole school level is an important goal for overall change. What is the meaning of this word “sustainability”? Fullan (2005) describes it as: “Sustainability is the capacity of a system to engage in the complexities of continuous improvement consistent with deep values of human purpose” (p. ix). Hargreaves and Fink (2000) have a different definition of sustainability: “Sustainability does not simply mean whether something will last. It addresses how particular initiatives can be developed without compromising the development of others in the surrounding environment now and in the future” (p. 30).

Leadership from “system thinkers” is the key to sustainability of systemic change within schools and systems (Fullan, 2005). Fullan refers to these leaders as “the new theoreticians—doers with big minds, who treat moral purpose as a cognitive as well as an emotional calling” (p. xiii). Heifetz and Linsky (2002) use the analogy of a “dance floor” and a “balcony” when describing these new theoreticians. These leaders must stay on the dance floor (exhibit deep leadership for learning) and be on the balcony (step back to get perspective) at the same time. It is easy to see how classroom teachers, who see change come and go due to a variety of reasons, can get caught up in a “project mentality or projectitis” view of change (Adelman & Taylor, 2007). Fullan (2005) answered this by pointing out the need for “leadership that motivates people to take on the complexities and anxieties of difficult change” (p. 104). Systemic change requires an infrastructure of “champions” to steer the process and become the mechanism for guiding change (Adelman & Taylor, 2007). Adelman and Taylor cited Tom Vander Ark (2002), executive director of education for the Bill and Melinda Gates Foundation, as saying, “Effective practices typically evolve over a long period in high- functioning, fully engaged systems” (p. 323). Stakeholders in change need to experience initiative in ways that produce feelings of collective identity, destiny, and vision (Adelman & Taylor, 2011). A definition that fits this study well combines the work of several change researchers: Sustainability is the capacity of a system to engage in the complexities of continuous improvement (change or innovation) without compromising the development of others in the surrounding environment now and in the future (Fullan, 2005; Hargreaves & Fink, 2006).

Research on change has been plentiful in the past decade. The idea of viewing change from the teacher’s perspective is a fairly fresh area of research. A seminal study examining the change process from within was done using middle school students and their teachers (Bascia & Hargreaves, 2000; Hargreaves, 1986, 1997; Hargreaves, Earl & Ryan, 1996). The study is the basis of the book, *Learning to Change*, written in 2000 by Hargreaves, Earl, Moore, and Manning. The teachers in this study were facing extensive curriculum changes. These changes could also be termed “systemic changes” since they occurred system wide. The teachers interviewed for this study provided a glimpse into their world of change. Communication with the participants of this study extended well beyond the original two-year period and into a period of five years after the initial study.

The greatest contribution of this study by Hargreaves et al. (2000) lies in using the eyes of the teachers as the conceptual lens. The teachers’ views highlighted the following areas that remain critical today in the study of the change process:

- What are the teachers’ perceptions of their contribution to implement and sustain change?
- What intellectual and emotional work must teachers do to successfully implement and sustain change?
- What supports do teachers need when implementing and sustaining change?

This research reiterates the idea that teachers are learners as well, and change requires new learning. Change is intellectual and emotional and requires a motivation to change (Bandura, 1986). This study revealed the need for a motivation leading to the steps of making sense of the change, translating what it takes to bring about the

change, and implementing the change. These steps were identified as critical through the eyes of the teachers when the pragmatic goal of the change was to take “ideas to reality” (Elmore, 1995).

The richness of gathering the teachers’ perspectives of change set forth the goal of representing the successes and frustrations associated with the process of change. Within an honest and open representation, the hope is that others may apply any knowledge gained to their process of change and garner more success and less frustration. This seminal study conducted by Hargreaves, Earl, Moore, and Manning (2000) provides an excellent framework for my research study of change from the view of the teacher operating within the change. This would begin to fill the existing gap in research from within the change process in education.

Since change is best studied from within the change itself, the opportunity to study simultaneous systemic change occurring during a four-year span at this particular independent school should not be left untouched or unnoticed. The goal of this particular research is for understanding of the change process from the perspective of teachers who lived it. The background of this particular situation lends itself to the need for study as well. Independent schools tend to be an under-researched group as a whole (Boerema, 2009). The change process is often approached quite differently in an independent school than in a public school, once again causing great argument for the need for this research. This particular time at this school provided the perfect research opportunity for investigating the teachers’ perceptions of change as seen through their lived experiences.

Purpose of the Study

The purpose of this study is to capture the lived experience of teachers in an independent school during a four-year period of multiple systemic changes. This was done in a retrospective manner to gain firsthand insights from within the systemic change. The perceptions on change from teachers with varying academic preparation, teaching experience, and tenure at the school provided valuable information concerning the process of simultaneous systemic change within an independent school.

This retrospective qualitative case study focuses on three areas of intentional systemic change over a four-year time span within an independent school. This process of change and its effect is documented through the eyes of classroom teachers and the effect that the changes had on them personally, technology integration, and collaborative leadership, practically, and professionally. The three areas of simultaneous systemic change were: classroom size reduction, technology integration, and collaborative leadership.

Research Questions

The following research questions were explored in this study. These questions build on the work done by Hargreaves, Earl, Moore, and Manning (2000).

1. What are the teachers’ perceptions of their contribution to implement and sustain change?
2. What intellectual and emotional work must teachers do to successfully implement and sustain change?
3. What supports do teachers need when implementing and sustaining change?

Method

The purpose of this study was to document and analyze the responses to simultaneous systemic change within an independent school as seen through the eyes of five classroom teachers as I, the researcher and primary administrator, interpreted the teachers’ perceptions. The changes occurred simultaneously within a four-year span. The teachers selected represent a variety of background in academic preparation, teaching experience, and tenure at the school. The data were generated from an interview protocol with questions carefully constructed from prior research. The questions were prepared in advance and reviewed to ensure clarity of the wording. As the researcher, I conducted the interviews for this study. The interviews were audio recorded, transcribed, and coded using open coding to break down, examine, compare and categorize data. The interview questions were grouped into four topics of change experienced by the teachers (classroom size reduction, technology integration, collaborative leadership, and systemic/general change), therefore, this allowed me to examine the transcripts in those specific categories. This produced the four main categories of: classroom size reduction, technology integration, collaborative leadership, and systemic/general change. I examined the teachers’ responses in those four categories and used open coding to break down, compare and categorize the data. These

codes were then examined for specific categories of responses that could be grouped together in common sub-categories. Within each sub- category codes were developed to allow specificity within the sub-category. Axial coding was then used to put the data back together by looking across each of the four main category areas for common and repeating codes. At this point, connections were made between and across categories from the coding of the four main categories. These connections produced the following emergent themes:

- Theme 1: Clarifying the Proposed Change and the Role of the Teacher in Change
- Theme 2: Clarifying the Role of the Administrator in Change
- Theme 3: Supporting Through Professional Development and Pacing of Change
- Theme 4: Building Trust and Team Membership

These codes and themes were generated by the use of Grounded Theory (Glaser, 2005). These findings produced valuable information to inform the following research questions:

1. What are the teachers' perceptions of their contribution to implement and sustain change?
2. What intellectual and emotional work must teachers do to successfully implement and sustain change?
3. What supports do teachers need when implementing and sustaining change? (I obtained permission to conduct the study through the Auburn University Human Subjects Research protocol process.)

Fullan (1993) and McLaughlin (1990) remind us that you cannot mandate what really matters for change to take place: skills, creative thinking, and committed action. Effective teachers, change agents, use mandates only as a catalyst to re-examine what they are doing. Fullan (1993) sums it up in these words: "When complex change is involved, people do not and cannot change by being told to do so" (p. 24). This reiterates the value and importance of recording the exact thoughts and words of the classroom teachers in this study. Change of any substance involves complex processes that once discussed openly with reflection have great value for learning. Change truly is learning and is most useful when viewed that way (Fullan, 2003).

Results and Discussion

The interview data revealed that even though many questions began around a particular systemic change that had been implemented, the answers given by the teachers were then applied to their view of the change process in general and any change encountered by teachers in the classroom. These three changes were important to be used as a catalyst for focus on change due to the fact that the changes were simultaneous and systemic during a set amount of time that could be studied with a set group of educators. The richness of this study is the fact that it is truly the change process as seen through the lived experiences of teachers that experienced the changes. The interview data in the study confirms the idea that change is a multi- dimensional process. The lived experiences of the teachers clarify that the change process does involve all aspects of an organization. The words of teachers from within the change process are invaluable to help inform and guide administrators as they facilitate the complexities of change within a school.

This research study has highlighted four themes that emerged from the lived experiences of the teachers participating in this study. The themes are as follows:

- Theme 1: Clarifying the Proposed Change and the Role of the Teacher in Change
- Theme 2: Clarifying the Role of the Administrator in Change
- Theme 3: Supporting Through Professional Development and Pacing of Change
- Theme 4: Building Trust and Team Membership

The four themes underscore the fact that change is complex and that learning to change is intellectually challenging (Hargreaves et al., 2000). My perception of the lived experiences of the teachers brought to life the findings of Evans (2001) when teachers were asked to reflect upon past changes they had been asked to make. In retrospect, teachers found that even involuntary change had a more positive impact than they originally thought it would and helped them grow professionally:

Yes I think it's been a very positive thing, you know, we all need pushes to help us grow and so I appreciate that the school has pushed us to grow in that and I really feel challenged every year to grow in a new way and I have, you know, just the people around me, again the collaboration has pushed me I guess like peer pressure you know in a positive way. Yes, there were those that were very excited and couldn't wait, there were those of us who said okay but you're going to help me. There were some that were scared to death. In fact the ones that were scared to death now count on it and use it regularly.
[“Cathy”, a teacher participant]

The complexity of change calls for complex strategies and leadership to address the needs of teachers when faced with change. This complex leadership needed for simultaneous systemic change in today's school setting calls for emotional intelligence. Emotional intelligence drives resonance (positively driving emotions to bring out the best in everyone) and in turn performance (Goleman et al., 2002). The themes in this data all point to the need for leaders to work on strong emotional intelligence as they lead others in the change process.

Conclusions

The teachers' lived experiences with systemic change process, as I interpreted them; provide valuable insight for teachers and administrators. The themes of change clarity, role clarity, professional development, pacing, trust, and team membership emerged from the data collected from the teachers' lived experiences with three simultaneous systemic changes. One could apply the idea that these would be important facets for undertaking any change not just the three highlighted in this particular school. When discussing change the teachers did not initiate, the strength was found in the experience of trust and team membership. Time invested in building a foundation of trust, dependability, and team membership pays off great dividends when embarking on change that is proposed to a group of educators.

In a school setting, it is very difficult to narrow change to one change at a time. The participants in this study leaned on their past school experience to cope with multiple systemic changes in an open-minded manner. The idea that multiple changes will occur in a school was not only accepted but also supported by the participants. Since multiple changes will occur, the idea of pacing and professional development is important in navigating multiple changes.

In a school setting, multiple changes occur simultaneously. The lived experiences of these teachers clearly indicated that people approach change differently. This was highlighted as the participants embarked on three simultaneous systemic changes at this school. The common thread was that each participant held in high regard the overarching idea that the changes were for the greater good of the students and the school.

The data collected from this study have generated numerous topics for discussion, including teacher self-efficacy and emotional intelligence in the change process. The results of this study suggest that it is valuable for administrators to invest time in the study of the change process. The change process within a school is complex for teachers and all involved. Change is personal and change within an organization is often slow. Even with the best of leadership, change which transforms culture and practice takes years. Addressing the complexities and focusing on the needs of those involved can dramatically influence in a positive manner the experience and outcome of the change process and the culture in which it takes place.

Recommendations

This research contributes to the body of research on educational change and more specifically multiple systemic changes as seen through the eyes of educators. It is unique in the fact that the research was conducted within the independent school sector. The insight gained from studying those within the change process is invaluable to all educators both teachers and administrators. The area of teacher self-efficacy and how it affects the individual change process was highlighted in this research as an area in need of future study. The lived experiences of those in this study indicated a direct link between a teacher's belief that he or she has the capacity to affect student performance and their capacity to embrace change (Tschannen-Moran, et al., 1998).

This research also revealed the importance of strong emotional intelligence and the benefit it brings to those leading change within a school. A time of systemic change within a school is definitely a time for leadership that is self-aware, empathic, motivating, and collaborative. Future research dedicated to emotional intelligence within the school setting would be valuable for both teacher and administrator (Goleman et al., 2013). My perceptions of the lived experiences of the teachers in this study suggest awareness is valuable for those supporting teachers in change. The data provided from this research study would be useful in developing a survey that would allow administrators to be aware of where teachers' perceptions are before and after facilitating major changes in their schools.

References

- Adelman, H. S., & Taylor, L. (2007). Systemic change for school improvement. *Journal of Educational and Psychological Consultation*, 17(1), 55–77. <http://doi.org/10.1080/10474410709336590>
- Anderson, M., & White, S. (2011). Resourcing change in small schools. *Australian Journal of Education*, 55(1), 50–61. <http://doi.org/10.1177/000494411105500106>
- Bandura, A. (1986, December). Fearful expectations and avoidant actions as coefficients of perceived self-inefficacy. *American Psychologist*, pp. 1389–1391. Retrieved from <http://spot.lib.auburn.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=ehh&AN=25062690&site=ehost-live>
- Bascia, N., & Hargreaves, A. (2000). *The sharp edge of educational change: teaching, leading, and the realities of reform*. London; New York: Routledge.
- Bloom, P. J. (2005). *Blueprint for action: Achieving center-based change through staff development* (2nd ed.). Lake Forest, IL: Gryphon House.
- Boerema, A. J. (2009). Does mission matter? An analysis of private school achievement differences. *Journal of School Choice*, 3(2), 112–137. <http://doi.org/10.1080/15582150902996708>
- Bryk, A. S. (1998). *Charting Chicago school reform: Democratic localism as a lever for change*. Boulder, CO: Westview Press.
- Dewey, J. (1938). *Logic: A theory of inquiry*. Carbondale, IL: Southern Illinois University Press.
- Dewey, J., & Jackson, P. W. (1991). *The school and society and the child and the curriculum* (1st ed.). Chicago: University Of Chicago Press.
- DuFour, R., DuFour, R., Eaker, R., & Many, T. (2006). *Learning by doing: A handbook for professional learning communities at work*. Bloomington, IN: Solution Tree.
- Ebbeck, M. A., & Waniganayake, M. (2003). *Early childhood professionals: Leading today and tomorrow*. Eastgardens, N.S.W.: MacLennan + Petty.
- Ebbeck, M., & Chan, Y. (2011). Instituting change in early childhood education: Recent developments in Singapore. *Early Childhood Education Journal*, 38(6), 457–463. <http://doi.org/10.1007/s10643-010-0435-8>
- Elmore, R. F. (1995). Structural reform and educational practice. *Educational Researcher*, 24(9), 23–26. <http://doi.org/10.3102/0013189X024009023>
- Evans, R. (2001). *The Human Side of School Change: Reform, Resistance, and the Real-Life Problems of Innovation* (1st edition). San Francisco, Calif.: Jossey-Bass.
- Fullan, M. (1999). *Change Forces: The Sequel*. London: RoutledgeFalmer.
- Fullan, M. (Ed.). (2003). *The Moral Imperative of School Leadership*. Toronto?: Thousand Oaks, Calif: Corwin.
- Fullan, M. (2005). *Leadership and Sustainability*. Thousand Oaks, CA: Corwin Press.
- Fullan, Michael. (1993). *Change Forces Probing the Depths of Educational Reform*. London and New York: RoutledgeFalmer.
- Glaser, B.G. (2005). *The grounded theory perspective III: Theoretical coding*. Mill Valley, CA: Sociology Press.
- Goleman, D., Boyatzis, R., & McKee, A. (2013). *Primal Leadership, With a New Preface by the Authors: Unleashing the Power of Emotional Intelligence* (10 Anv edition). Boston, Massachusetts: Harvard Business Review Press.
- Goleman, D., McKee, A., & Boyatzis, R. E. (2002). *Primal Leadership: Realizing the Power of Emotional Intelligence*. Harvard Business Press.
- Hargreaves, A. (1986). *Two cultures of schooling: the case of middle schools*. Falmer Press.
- Hargreaves, A. (1997). Rethinking Educational Change with Heart and Mind. *ASCD Yearbook*. Retrieved from <http://eric.ed.gov/?id=ED404732>
- Hargreaves, A., Earl, L., Moore, S., & Manning, S. (2000). *Learning to change: teaching beyond subjects and standards*. San Francisco: Jossey-Bass.
- Hargreaves, A., Earl, L. M., & Ryan, J. (1996). *Schooling for Change: Reinventing Education for Early Adolescents*. Falmer Press.
- Hargreaves, A., & Fink, D. (2006). *Sustainable leadership*. San Francisco: Jossey-Bass.
- Hargreaves, A., & Fullan, M. (2000). Mentoring in the New Millennium. *Theory Into Practice*, 39(1), 50. http://doi.org/10.1207/s15430421tip3901_8
- Louis, K. S., & Kruse, S. D. (1995). *Professionalism and community: perspectives on reforming urban schools*. Thousand Oaks, Calif.: Corwin Press.
- Marzano, R. J. (2003). *What works in schools: Translating research into action*. Alexandria, VA: Association for Supervision and Curriculum Development.

- McLaughlin, M. J. (1990). The Rand change agent study revisited: Macro perspectives and micro realities. *Educational Researcher*, 19(9). <http://doi.org/10.3102/0013189X019009011>
- Newmann, F. M., & Wehlage, G. G. (1995). *Successful school restructuring: A report to the public and educators by the Center on Organization and Restructuring of Schools*. National Association of Secondary School Principals [distributor].
- Nye, B., Konstantopoulos, S., & Hedges, L. V. (2004). How large are teacher effects? *Educational Evaluation and Policy Analysis*, 26(3), 237–257. <http://doi.org/10.3102/01623737026003237>
- Prochaska, J., Norcross, J., & DiClemente, C. (2007). *Changing for good: A revolutionary six-stage program for overcoming bad habits and moving your life positively forward* (Reprint edition). New York: William Morrow Paperbacks.
- Sin, S., McGuigan, N., & Chung, I. (2011). Staff sentiment and engagement: A critical consideration in a time of change. *Asian Social Science*, 7(11), 81–92. <http://doi.org/10.3102/01623737026003237>
- Tschannen-Moran, M., Hoy, A. W., & Hoy, W. K. (1998). Teacher efficacy: Its meaning and measure. *Review of Educational Research*, 68(2), 202–248. <http://doi.org/10.3102/00346543068002202>
- Vander Ark, T. (2002). The case for small high schools. *Educational Leadership*, 59(5), 55–59. Retrieved from <http://www.ascd.org/publications/educational-leadership/feb02/vol59/num05/The-Case-for-Small-High-Schools.aspx>

Academic Coaching in an Online Environment: Impact on Student Achievement

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Abstract: Although the idea of online education is not new, the development of massive open online courses (MOOCs) brought the idea of using 100% online courses in higher education to the forefront of educational debate. As more universities offer 100% online programs, concerns about student retention and academic outcomes continue to linger. In addition to these concerns in general, there are questions regarding the increasingly large class sizes and the effectiveness of different ways of minimizing the impact of this size on both instructors and students. Academic coaching provides a potential way of addressing both concerns. In this model, trained coaches assist instructors with course related matters such as grading assignments, overseeing and grading discussion boards, and grading and providing feedback on written assignments. However, there are concerns regarding the effectiveness of the model on student academic outcomes and student satisfaction. The current study examined differences in student satisfaction and the role of Need for Cognition (NfC) in student outcomes. Results indicate that students with higher levels of NfC are more satisfied with professors, courses, and programs overall both when coaches are used and when they are not.

Keywords: Academic coach, Need for cognition, Student achievement, Student satisfaction

Introduction

Online learning can trace its roots back much further than one might expect, beginning with the University of Chicago offering the first correspondence courses in 1892 (Online Schools Center, 2019). In 1976, education took a significant step towards the online learning model that we know today. That year, Coastline Community College became the first virtual college. Fully online courses became possible when Blackboard was released in 1997. Blackboard served as the first eLearning platform and is still used in higher education. The introduction of Apple iTunes U provided access to college-level lectures and increased the interest in and demand for alternatives to traditional brick-and-mortar universities. Massive open online courses (MOOCs) brought online education and the debate over its effectiveness to the forefront of educational science.

Although online education is a mainstay of higher education, there are still concerns about the effectiveness of learning through this format. Faculty historically resisted online learning (Allen & Seaman, 2006) and the belief persists that students in traditional courses are more successful than their online peers (Bowen, Chingos, Lack, & Nygren, 2012; Ward, Peters, & Shelley, 2010). Furthermore, the increasingly larger class sizes can lead to a lack of faculty engagement with students, increased stress on professors, and a poorer quality experience for students.

Academic coaching provides a means of addressing these concerns. Although academic coaching is a somewhat new approach for online education, the research is promising. Gazza and Matthias (2016) found that the use of academic coaches help increase enrollment, reduce faculty stress and promote student success. In addition, academic coaches have a positive impact on student experiences resulting in greater student satisfaction (Cipher, Urban, & Mancini, 2018). However, the research into the effects of academic coaching is extremely limited.

Furthermore, the role of cognitive resources in online learning is lacking. Cacioppo and Petty (1982) identified Need for Cognition (NfC) as extent to which an individual enjoys and tends to engage in effortful mental tasks. NfC correlates with academic achievement, student satisfaction, and intelligence scores. However, these findings have not extended into the realm of virtual education or how NfC influences students' perceived experiences with academic coaches. Therefore, the current study examined the effect of academic coaches and Need for Cognition on student satisfaction with their overall program of study, with the professor for the course, and with the course experience.

Academic Coaching Model at LSU

Graduate level education courses are 100% online and courses are 7 weeks in length. If a class has more than 30 students, the instructor can request an academic coach. Coaches are assigned based on a 30-count basis (e.g., if there are 60 students in a course, the instructor can request three academic coaches). Although the instructor of record is responsible for all curriculum-related activities, the coaches' duties can include grading exams, overseeing and grading discussion boards, and grading and providing feedback on written assignments.

Methodology

Participants

Participants were recruited through the Masters of Education: Curriculum and Instruction and Masters of Education Leadership programs at Louisiana State University-Shreveport. A total of 145 students participated over a single 7-week academic term.

Instruments

Need for Cognition Scale

The Need for Cognitions Scale (Cacioppo, Petty, & Kao, 2013) measures individual differences in participants' tendency to engage in and enjoy mental endeavors. The scale consists of 18 items with responses being on a Likert scale from 1-5 with 1 being highly uncharacteristic of me. Based on previous research, the Need for Cognition Scale appears to be a valid and reliable measure of individuals' tendencies to pursue and enjoy the process of thinking—that is, of their "need for cognition" (Cacioppo & Petty, 1982; Cacioppo, Petty, Feinstein, & Jarvis, 1996; Cacioppo et al., 1984; Sadowski, 1993; Sadowski & Gulgoz, 1992b). Need for Cognition scores are not influenced by whether an individual is male or female, or by differences in the individual's level of test-taking anxiety or cognitive style (the particular way that an individual accumulates and merges information during the thinking process). In general, social desirability responses do not affect scores on the NFC (Cacioppo & Petty, 1982). Studies show that NFC is related to academic achievement (Cacioppo, Petty, Feinstein, & Jarvis, 1996), student satisfaction (Grass, Strobel & Strobel, 2017), and intelligence scores (Wilhem, Schulze, Schmiedek, & Süß, 2003).

Student Satisfaction Survey

This survey was adapted from the questionnaire used by Grass, Strobel and Strobel (2017). The survey consists of 10 statements such as "I like to study" and "Studying this subject has great personal meaning to me" and participants rated each statement on a scale of 1 to 5 with 1 being "extremely uncharacteristic of me" and 5 being "extremely characteristic of me". Responses were averaged to provide the student satisfaction score.

Procedure

After obtaining IRB approval, an informed consent document, the Need for Cognition Scale, the Student Satisfaction Survey, and a demographic form were made available to students in the MEDCI and MEDL programs through a link available in Moodle. Near the end of each 7-week academic term, instructors for the programs announced the presence of the survey and encouraged students to participate; however, students were not penalized if they chose not to participate. After the surveys closed, an assistant assigned a randomly generated number to each participant to allow for tracking the student across courses without the researcher being able to identify individual students.

Results

We used three one-way ANOVAs to determine the impact of NfC scores and the presence/absence of an academic coach on student satisfaction with the program overall, satisfaction with the course, and satisfaction

with the instructor of record. For the NfC scores, we did a median split and excluded any student scores that fell exactly at the median, leaving 139 participants. The remaining students were divided into a high NfC group and a low NfC group. The results showed that having an academic coach had no effect on overall student satisfaction with the program and no interaction. NfC did have a significant effect, $F(1,130) = 39.78; p < .001; \eta^2 = .234$ (see Figure 1). Students with higher NfC scores reported higher levels of satisfaction with the course overall (mean = 41.63; SD = 4.28) than did students with lower NfC scores (mean = 36.49; SD = 4.73).

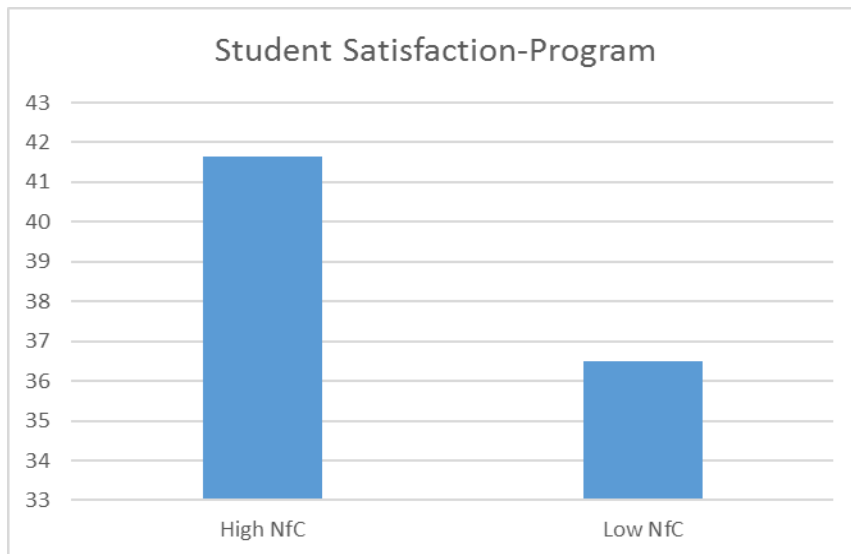


Figure 1. Student Satisfaction with Program of Study

Next, we examined the impact of NfC and presence of an academic coach on satisfaction with the instructor. The results revealed no significant impact from the presence of an academic coach and no interaction. However, NfC scores did impact student satisfaction with the instructor, $F(1,130) = 4.20; p = .042; \eta^2 = .031$ (see Figure 2). Students with higher NfC scores reported higher levels of satisfaction with the instructor (mean = 4.90; SD = .30) than did students with lower NfC scores (mean = 4.71; SD = .58). Finally, we examined the effect of NfC and presence of an academic coach on student satisfaction with the course. Again, results revealed no effect of the presence of an academic coach and no interaction. NfC scores affected student satisfaction with the course, $F(1,130) = 10.81; p = .001; \eta^2 = .07$ (see Figure 2). Students with higher NfC scores reported higher levels of satisfaction with the course (mean = 4.82; SD = .42) than did students with lower NfC scores (mean = 4.65; SD = .57). In general, the results showed a pattern of NfC playing a key role in student satisfaction, in courses that have academic coaches as well as in courses that do not.

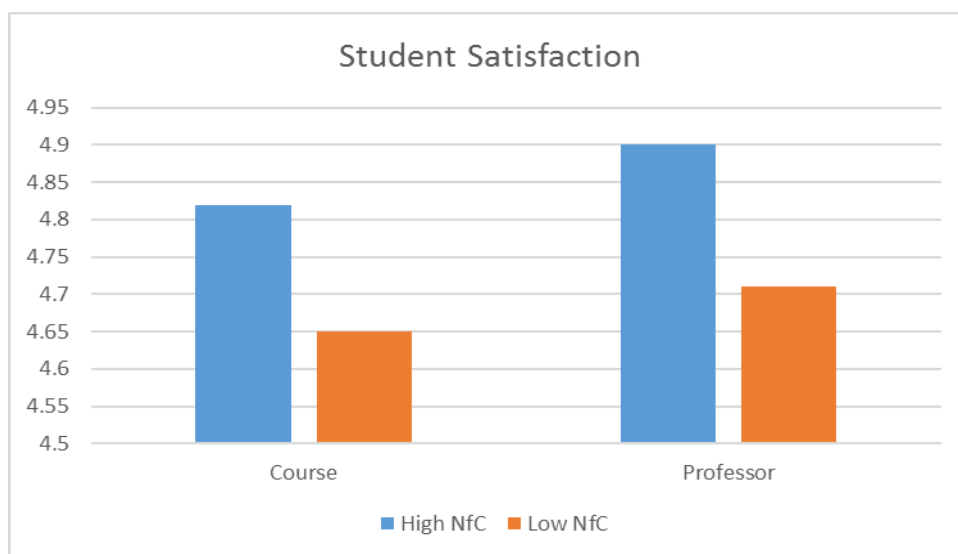


Figure 2. Student Satisfaction with Course and Instructor

Conclusion

The current study found that students with higher levels of Need for Cognition reported higher levels of satisfaction with the overall program experience, with the professor for the course, and with the course itself. These findings are consistent with findings by Grass, Strobel and Strobel (2017) in which higher levels of NfC contributed to greater student satisfaction and extend those findings into the realm of online education. Although there were no significant differences based on the presence of an academic coach, there was a numerical trend with students who had academic coaches reporting higher levels of satisfaction with the program overall and with the professor for the course. This finding provides preliminary support for the academic coaching model as a way to provide support for professors while maintaining both quality instruction and student satisfaction. With student satisfaction often being a factor in students' decisions to continue in a program (Grass, Strobel & Strobel, 2017), using academic coaches can also contribute to the retention of students within a program.

As online education continues to grow and thrive, it is increasingly important to identify ways to improve the experience for both students and instructors. Using academic coaches provides a viable way of addressing the needs of all parties. Academic coaches reduce the demands, and the subsequent stress, that comes with teaching large classes (Cipher, Urban, & Mancini, 2018; Gazza & Matthias, 2016). At the same time, academic coaches potentially improve the experience for students as well, resulting in higher levels of student satisfaction and retention.

Limitations

The limited focus of this study (i.e. graduate programs) made determining the impact of academic coaches on student achievement difficult. Student GPA is the most common means of measuring academic achievement, but the requirements for the programs (minimum GPA of 3.0) artificially limited the variance in the sample. Consequently, the ability to assess the impact of academic coaches on academic success was limited. In addition, the current sample came from a single academic term resulting in a small sample size. It is possible that the study lacked sufficient power to tease out differences in student experiences between courses that used an academic coach compared to those where students interacted solely with the professor.

Future Research

The study is ongoing, thus allowing for tracking students across academic terms and across courses. This allows for a more robust exploration students' experiences across courses and instructors both with and without academic coaches. Furthermore, the researchers identified three questions to add to the demographic questionnaire: how likely are you to continue in this program of study (1 very likely to 5 do not plan to continue); how satisfied were you with the academic coach in this course (1 very satisfied to 5 very dissatisfied); and how often, during this course, did you think about quitting the program (1 very often to 5 never thought about quitting). Finally, expanding the study to include students in undergraduate courses will provide the ability to explore effects of academic coaches on student achievement as well as student satisfaction.

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References

- Allen, I. E., & Seaman, J. (2006). *Making the grade: Online education in the United States, 2006*. The Sloan Consortium. Retrieved from <https://eric.ed.gov/?id=ED530101>
- Bowen, W. G., Chingos, M. M., Lack, K. A., & Nygren, T. I. (2013). Online learning in higher education. Retrieved from https://educationnext.org/files/ednext_XIII_2_bowen_chingos.pdf
- Cacioppo, J. T., Petty, R. E., & Kao, C. F. (1984). The efficient assessment of need for cognition. *Journal of Personality Assessment*, 48, 306-307.

- Cacioppo, J. T., Petty, R. E., & Kao, C. F. (2013). Need for Cognition Scale. Measurement Instrument Database for the Social Science. Retrieved from www.midss.ie
- Cacioppo, J. T., Petty, R. E., Feinstein, J. A., and Jarvis, W. B. G. (1996). Dispositional differences in cognitive motivation: the life and times of individuals varying in need for cognition. *Psychological Bulletin*, *119*, 197–253.
- Cipher, D.J., Mancini, M.E., & Shrestha, S. (2017). Predictors of persistence and success in an accelerated online RN-to-BSN program. *Journal of Nursing Education*, *56*, 522-526. doi:10.3928/01484834-20170817-02
- Education Centre. (2012). Retrieved from <http://instructionalconnections.com/index-3.html>
- Gazza, E.A., & Matthias, A. (2016). Using student satisfaction data to evaluate a new online accelerated nursing education program. *Evaluation and Program Planning*, *58*, 171-175. doi:10.1016/j.evalprogplan.2016.06.008
- Grass, J., Strobel, A., & Strobel, A. (2017). Cognitive investments in academic success: The role of Need for Cognition at university. *Frontiers in Psychology*, *8*:790. doi: 10.3389/fpsyg.2017.00790
- Online Schools Center (2019). <https://www.onlineschoolscenter.com/history-of-online-education>
- Pappano, L. (2012). The year of the MOOC. *The New York Times*. Retrieved from <https://laurapappano.com/articles/the-year-of-the-mooc/>
- Ward, M. E., Peters, G., Shelley, K. (2010). Student and Faculty Perceptions of the Quality of Online Learning Experiences. *International Review of Research in Open and Distance Learning*, *11*(3), 57-77.
- Wilhelm, O., Schulze, R., Schmiedek, F., & Suß, H.-M. € (2003). Interindividual differences in typical intellectual engagement. *Diagnostica*, *49*, 49–60. doi:10.1026//0012-1924.49.2.49



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