The Journal of Learning in Higher Education

Contents

The Journal of Learning in Higher Education

JW Press

Martin, Tennessee

Board of Reviewers

Editor

Dr. Edd R. Joyner
Edd@JWPress.com

The Journal of Learning in Higher Education.

JLHE is a new journal devoted to providing a venue for the distribution, discussion, and documentation of the art and science of learning at the college and university level. A cornerstone of the philosophy that drives JLHE, is that we all can learn from the research, practices, and techniques of disciplines other than our own. The Finance Professor can share with and learn from the Art Professor. To enhance this cross pollination, submitted manuscripts should not dwell on the subject being learned but rather the methods, techniques, environments, etc that affect the learning.

Manuscripts that support the advancement of learning in higher education are actively sought for publication in The Journal of Learning in Higher Education. Articles that report on innovative practices and articles that research theoretical issues in learning are equally desired. Additionally, papers that take a philosophical perspective on the state of learning yesterday, today and/or tomorrow are welcome.

The Journal of Learning in Higher Education has been listed in Cabell's Directory of Publishing Opportunities in Educational Psychology and Administration since its 7th edition.

Subscription and submission information is available online at JWPress.com/JLHE.htm

Strengthening the Supply Chain between Business and Academe through Course Design Feature Selection

Daniel L. Tracy
Beacom School of Business
University of South Dakota

John E. Knight
College of Business and Public Affairs
University of Tennessee at Martin

Mark W. Rieman
Department of Accounting
East Carolina University

ABSTRACT

As one of the important stakeholders in the academic process, business employers and their preferences should be considered when college instructors select various course design features. Although employers are not the only stakeholders in the academic process, their need for an appropriately skilled supply of potential employees makes them an important customer of that process. This paper examines a large sample of employer-based data regarding their preferences with respect to fourteen controllable course design features. The preferences are examined in light of their relative ranked importance and relative intensity. Additionally, the data is examined in light of potential differences in course design preferences relative to various demographics. The paper summarizes the ranked contributions of different course design features from a supply chain perspective. These findings should assist colleges and professors in designing course parameters from a supplier's perspective in order to meet business expectations in the human resources supply chain.

Introduction

Since colleges and businesses are directly linked in the human resource educational/ business supply chain, it is logical that they should aggressively work together to improve curriculum design and content in order to insure graduates are given the appropriate skill sets necessary for success. Following this strategy, both new graduates and their respective colleges would benefit. New graduates from these colleges would be in greater demand for placement in desirable jobs, while the reputation of the colleges would be enhanced, thus improving college enrollments in terms of size and/or quality. For businesses, this strategy would create a supply of students better prepared for employment with discipline-specific knowledge/skills for immediate employment, plus transferable skills (presentation, communi-

cation, and participation abilities) that enhance and ensure long term employability. This would ensure that new employee productivity will increase both in the short and long run. (Cox and King, 2006)

Supply chain management has been a particular focus for business in recent years. (Abuhilal, Rabadi, and Sousa-Poza, 2006) This emphasis has especially targeted the supply chain that deals with subcomponent suppliers, shippers, and material providers so that the seamless supply of high quality parts using a JIT sequence will be totally integrated at minimum cost. For example, the heavily integrated nature of engineering departments (as suppliers) and production departments (as customers) includes: daily e-mail interaction; many on-site visits to determine exact needs, coordinates timing, and reduced costs; integration

of computer systems via EDI for ordering and scheduling; and managerial interaction to ensure customer satisfaction and understanding.

However, far less emphasis has been given to the supply chain as it relates to human resources. A large number of companies make the statement that "people are our most important resource." If that is true, then suppliers that provide companies with those resources should be very closely linked through an effective, efficient, integrated supply chain. For many companies, the source of managerial, accounting, marketing, and financial talent flows directly from colleges and universities. However, the same close-knit linkages that exist in physical distribution supply chains do not routinely exist in human resources supply chains. Rather, most linkages are informal, advisory, and/or several steps removed from direct contact. In some academic programs, a few of these linkages are developed and implemented, but normally for a small minority of students.

The informal and advisory linkages include such programs as business (or public sector) advisory boards, cooperative student learning experiences, student internships, and general interactive experiences of university personnel with business through consulting and interpersonal relationships. In general, advisory boards are typically composed of business leaders who meet with an administrator on an annual or semiannual basis to discuss how to improve business/college interaction and to discuss business needs and desires as related to curriculum and course content. Cooperative learning experiences tend to be opportunities for students to learn company-specific systems and participate in business processes, but the student then returns to study a series of courses that may or may not relate to the student's on-the-job experiences. Internships are much like cooperative learning experiences, but tend to be shorter term student learning experiences with an opportunity for the company to observe and consider employing a particular student. The interaction of faculty with industry through consulting does provide faculty with exposure to the latest industrial techniques and the opportunity to integrate them into classroom material. However, faculty consulting seldom integrates the student actively into the process. In summary,

evidence seems to indicate that there is no direct supply chain relationship between academia and business, since businesses rarely contract to hire students from a particular college using a given curriculum with pre-determined course content and presentation style. Thus, the general observation that businesses have not been very aggressive or focused on developing and refining its human resource supply chain seems reasonable. As an example, the perspective of Toyota makes the following observation about the almost nonexistent ties in the supply chain. "Basically, here's how it works at Toyota: The kids get out of the university and join the company. Then they're told, 'Okay, you know how to do math, and you know how to read. Forget all the rest of the crap. We hope you had a lot of party time because now you're going to be working long hours for the next 40 years, and we will teach you what you need to know.'" ("The Lion", 2005)

Meanwhile most colleges and universities view their role as educational in a general sense, but not supply chain oriented in a more specific sense. Academically, educational efforts have focused primarily on general curriculum design so as to meet the needs of various national or regional accrediting agencies. The general responsibility of making the relationship between academe and business has been somewhat transferred to the general purview of the appropriate accrediting agency. For example, AACSB (the Association to Advance Collegiate Schools of Business) serves as an accrediting agency for over 1,000 colleges and schools of business (www.aacsb.edu). They have established guidelines for meeting the standards of performance expected in academe as well as with educational and skill sets desired by businesses based on broad consultation with businesses and on trends in business education. Student exposure to various topics are mandated (reference AACSB guidelines) and audited so as to hopefully guarantee a given threshold level of competence of any graduate from an AACSB-accredited college. The actual course content and course design presentation methodology are considered, but not emphasized nor rigorously audited during a site visit. Additionally, auditing site visits are made by academics and not by the employers or businesses that hire the graduates.

The lack of close supply chain coordination between colleges and business may be exacerbated by the sheer number of colleges that may potentially supply new graduates for a business. Whereas in supply chain management, a drive to minimize the number of suppliers is constantly on-going, few employers have a specific drive to limit potential employees to a limited pool of colleges. Thus, the drive to establish close linkages is not well focused. However, the success of supply chain management would tend to indicate that better coordination and integration in the supply chain would enhance effectiveness and efficiency for both supplier and customer.

In an effort to make the supply chain linkages incrementally more meaningful, this research focused on course design features that business desires in its supply chain so as to provide students with necessary transferable skill sets that more typically are useful in achieving actual business success and employability. More specifically, the paper will attempt to identify and prioritize controllable course design features such as attendance, class participation, teamwork, group projects, etc. that may enhance student employability. Meanwhile, uncontrollable course design features such as such as time of day of course offering, quantitative or qualitative nature of the course and personal characteristics of the faculty member teaching the course were de-emphasized as they were considered uncontrollable variables. The components of course curriculum and specific course content were also not primary considerations. For example, the course design features selected could be applied to any course and/or major in business. The course design features examined can be integrated into any course and would serve to better equip the student with the transferable skills/characteristics desired by business, thus strengthening the supply chain linkage in the supplier/customer relationship.

Literature Survey

At the present time, the literature indicates that significant research has been directed to the linkage in the downstream supply chain between students and universities in terms of how courses are designed and delivered. These linkages have been examined through research on evaluating teaching and course delivery through student evaluations (d'Apollonia and Abrami, 1997; Greenwald, 1997) and through using student evaluations for assigning performance ratings to instructors. (McKeachie, 1997; Theall and Franklin, 1990) Other efforts have focused on measuring course parameter factors such as course workload (Greenwald and Gillmore, 1997), student satisfaction, and the impact of demographic characteristics on course selection and related satisfaction. (Martin, 1989) These studies and numerous others have been directed toward improving the effectiveness and efficiency of the supply chain linkage between the student and the course delivery at the university as students prepare for future careers.

Far less research has been directed toward the upstream linkage between universities and businesses. However, recent studies seem to point to some developing interest in that direction. Newmann and Banghart (2001) asserted that the relationship between industry and academia was a "gap to be bridged" – thus pointing out the deficiency in the supply chain relationship. Higher education has attempted to bridge that gap by attempting to encourage employers to become more actively involved in course design, course delivery, and assessment to increase the employability of students.

The concept of embedding employability into the design of a university degree where employers served on the design team identified two important skill sets called transferable skills and subject skills. (Cox and King, 2006) Transferable skills were defined as those skills that are applicable throughout a working life. Subject skills were those more relevant to each career choice (accounting, finance, marketing, etc.). Harvey, Moon, and Geall (1997) had previously identified several skills that were of long term value to the student and viewed as important to business (such as communications, teamwork, flexibility, critical/analytical thinking, and process management).

The importance of similar skills that are not subject-specific and their importance has been emphasized by others. These skill sets relate directly to the same transferable skill sets suggested

by Cox and King. Stueck (1997), based on a survey by the Business Council of BC, similarly reported that communications skills including the ability to read, write, and understand what is said ranked first of fifteen qualities of importance in hiring, retaining, and promoting workers, while mental capacity ranked eighth. Weisz (2000) found that employers desired growing emphasis on such characteristics as communication, interpersonal skills, teamwork, initiative, and ability to solve problems, as the most frequently cited general skills desired in prospective cooperative students that were to be hired.

In an effort to determine differences between student and business attitudes toward selected academic and personal skills, Graham and Krueger (1996) surveyed finance students and compared their ranked selections against the ranked survey results from Collier and Wilson (1994) from Fortune 1,000 CFO's. The analysis indicated that CFO's ranked ethics, interpersonal skills, oral and written communications, and decision making as most important, while students ranked technical skills such as math and computer literacy higher. These results are consistent with the notion that transferable skills are high on employers' lists, while students rank technical competence higher. However, the article did not attempt to correlate these assessments of personal attributes back to the preparation and delivery of college courses though the appropriate selection of course design parameters.

One final thread of research has examined the importance of subject and transferable skill sets in achieving success in obtaining a first job. Bills (1988) found that educational credentials are far more important for gaining the entry level job in an organization than they are for getting a promotion. Walters (1995) further found that grade point averages were merely helpful in increasing the students' ability to get a job interview, but other factors are also important in the long term employability of the student.

Previous research seems to indicate that businesses are greatly interested in high quality employees, but little research has been reported on how businesses actually identify priority skill sets important to defining the supply chain linkage. Also limited research has been reported by academicians on the linkage definition and coordination. The research fails to identify practical guidelines of how courses should be more fully developed in terms of controllable course parameters that would generate graduates with transferable skill sets appropriate to any major and thereby strengthen the linkage of the academic-business supply chain.

Research Direction and Methodology

The research presented attempts to analytically demonstrate the business stakeholder's perception of "value added" to potential employees based on their experienced perception of skills and attributes needed in the workplace relative to the course design features that students encounter in college business courses. The survey instrument asked business professionals to rank-order fourteen controllable course design features and identify the preferred intensity levels for each feature. Based on the responses from employers, for those academicians so inclined, course design features and intensity levels can be chosen with the purpose of increasing the value of the student to potential employers. By designing course parameters based on input from the business stakeholder, academia can provide increased opportunity for students to develop the transferable and subject skill sets more likely to increase value to the potential employers.

The research included several steps. First, a review of the relevant literature was utilized to develop a brainstorming list of controllable course design parameters. Then a ranking instrument of course design parameters was administered in light of research relating to parameters that were found to be significant within the overall course selection process. (Babad, 2003) Third, a survey of the data was completed by 118 employers in the regional service area of a university in the southeastern United States during the fall of 2005. A copy of the business survey is included in the appendix. The fourteen course design preferences were supplemented by five demographic dimensions including gender, current position, education level attained and department type.

The survey was administered as follows. The employers were asked to rank the college course design features from 1 to 14 based on the relative importance of each feature in terms of how they would value each course design parameter in a course based on their business experience. Each business respondent was asked to consider ranking the design features as if they were designing a college class based on what they would deem most important based on their experience.

Previous studies by Harvey, Moon, and Geall (1997), Stueck (1997), and Weisz (2000) collectively identify business preferences to be of two types: transferable skills to include written/verbal communication, teamwork/interpersonal, flexibility/initiative, and critical/analytical problem solving abilities, while subject skills relate more to academic achievement. However, prior literature provides no information or suggestions of how to develop these skills by developing corresponding course design features that focus on these skills. One purpose of this paper is to put forth the fourteen design factors as reasonable surrogate measures for operationally defining general course design contributions to both skill sets as a way of providing supply chain linkages between employers and academics.

Associated with each course design parameter in the survey are two alternative intensity levels. The intensity levels were designed to elicit differentiation in preferences for implementing each parameter. Business respondents were asked to select one of two intensity levels for each course design parameter as a way of refining the analysis. Combined with the importance rankings, intensity level information will indicate specific value driver implementation preferences for employers. This refinement will serve to identify what value drivers are important and how each could be implemented to enhance value as evaluated by the employer in the supply chain.

Survey Results and Statistical Analysis

Sample Size and Demographics

Survey respondents were asked to provide information regarding several demographic variables, including gender, current position, education, and department type. Data identifying years of experience was partitioned into four groups: 1) those with less than 10 years; 2) those with 10-19 years; 3) those with 20-29 years; and 4) those with over 30 years experience. Data regarding the number of subordinates was partitioned into three groups: 1) those with less than 10 employees; 2) those with 10-99 employees; and 3) those with 100 or more employees.

The sample demographic breakdown is as follows (sample size in parentheses):

- ▶ Gender: female (28), male (90)
- ▶ Years of experience: <10 (14), 10-19 (33), 20-29 (33), 30+ (38)
- ▶ Number of employees: <10 (61), 10-99 (42), 100+ (15)
- ▶ Current position: entry/middle level (47), executive (71)
- ▶ Education: < bachelor's degree (19), bachelor's degree (54), graduate degree (45)
- ▶ Dept: management (42), accounting/finance (25), marketing (16), other (35)

Design Feature Rankings

A summary of the course design feature rankings is given in Table 1. The fourteen design features are listed in order of employer-ranked importance. The average ranking for each feature was calculated from the survey responses. Associated with each average rank is the designation of a ranking group. While statistical analysis of ranked data can be troublesome, the research was designed to foster a thorough statistical analysis.

For a large number of ranks ($k > 11$) and a large sample ($n > 30$), asymptotic distributions of rank statistics are approximately normal by the central limit theorem. (Kim, 2005) For our study $k = 14$ and $n = 118$, so standard statistical analysis is appropriate. A standard ANOVA was completed revealing an $R^2 = 22.5\%$, indicating that the collective explanatory power of variation between features is weak, implying at least some statistical independence among the features. Pair-wise confidence intervals were calculated with a 95% confidence level.

TABLE 1
COURSE DESIGN FEATURE RANKINGS

Item #	Description	Average Rank	Ranking Group
10	Class Discussion/ Participation	4.20	1a
9	Class Material/Test Relationship	5.18	1b
2	Delivery style	5.25	1b
3	Attendance Policy	5.83	1c
6	Out of Class Work	5.86	1c
13	Group Projects	6.88	2
8	Use of Technology	6.96	2
5	Research Paper	8.10	3a
4	Test Format	8.69	3a
7	Grade Expectations	9.03	3b
1	Topics/Test	9.28	3b
11	Final Exam Coverage	9.59	3c
14	Grade % - Group Projects	9.82	3c
12	Grade % - Final Exam	10.34	3d

The ranking groups in Table 1 reflect three groups whose average rankings were statistically different from other groups based on the aforementioned confidence intervals. Group 1 consisted of five features labeled 1a, 1b, and 1c. Although confidence intervals did overlap within the group (1a with 1b, and 1b with 1c), as a group the mean rankings are statistically significantly lower than those from any other group. Within group 1, confidence intervals indicated that subgroup 1a average rankings were statistically lower than those of subgroup 1c. Similarly, confidence intervals indicated that group 3 could be partitioned into four subgroups 3a, 3b, 3c, and 3d. Again adjacent subgroups did have overlapping confidence intervals, but non-adjacent subgroups were statistically different within the group. Confidence intervals elicited three major statistical groups from the fourteen design features. It is a reasonable inference that those features in group 1 are statistically more important to employers than those in any other group. From an employer perspective the groups are ranked 1-3 in order of most importance. As a way of categorizing the groups, we will refer to the design feature groups as follows: group 1 as "very important features"; group 2 as "somewhat important features"; and group 3 as "not very important features".

Table 2 contains the Spearman rank correlation matrix. Spearman's rank correlation coefficient identifies the relationship between the various design features. (Lehmann, 1998; Spearman, 1904) The coefficient is 0.57 between final exam coverage (feature 11) and the percentage of grade based on the final exam (feature 12). The coefficient is 0.50 between group projects (feature 13) and the percentage of grade based on group projects (feature 14). These two moderate rela-

TABLE 2
SPEARMAN RANK CORRELATION MATRIX

Features	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	1													
2	0.05	1												
3	-0.10	-0.17	1											
4	0.06	0.08	-0.10	1										
5	-0.08	-0.06	-0.21	-0.27	1									
6	-0.12	-0.04	-0.07	-0.05	0.10	1								
7	-0.16	-0.14	0.08	-0.05	-0.15	-0.13	1							
8	-0.06	0.13	-0.07	-0.17	-0.07	-0.03	-0.13	1						
9	0.08	0.04	-0.21	0.24	-0.12	-0.01	0.03	-0.29	1					
10	-0.23	0.00	-0.04	-0.16	-0.07	0.14	-0.08	-0.02	0.13	1				
11	0.14	-0.32	-0.09	0.03	-0.14	-0.21	0.14	-0.22	0.05	-0.31	1			
12	-0.04	-0.36	-0.08	-0.01	-0.19	-0.16	0.16	-0.10	-0.14	-0.32	0.57	1		
13	-0.30	-0.14	-0.04	-0.21	0.11	-0.15	-0.23	0.00	-0.32	0.10	-0.29	-0.26	1	
14	-0.28	-0.26	0.00	-0.24	0.02	-0.19	-0.26	-0.16	-0.27	-0.07	-0.06	0.21	0.50	1

tionships are rather intuitive and thus not unexpected. The rest of the coefficients are smaller in magnitude. All are between -0.36 and 0.21 with the vast majority falling between -.20 and 0.20. The null hypothesis is that the feature rankings are independent. We cannot conclude that the rankings are statistically independent (p-value < 0.001). However, this conclusion is the result of the large sample size. The magnitudes of the correlation coefficients indicate (except for the two previously mentioned pairs of features) that the feature rankings, while statistically repeatable, are independent for practical decision making purposes. Except for the two moderate relationships described above, all other pair-wise relationships exhibit R^2 values of less than 13% (87% of variation unexplained) with the vast majority resulting in R^2 values less than 4% (96% of the variation unexplained). For practical purposes one can assume that the design features are relatively independent. See Hahn (1993) for a discussion relating to the importance of statistical and practice differences.

A thorough analysis of the rankings was also completed by partitioning the sample by the demographic characteristics. This analysis resulted in minor differences in average design feature rankings and ranking groups as compared to the entire sample. Generally the ranking group identified above for each feature is very stable, although minor ranking group differences did occur. The survey instrument allowed for the identification of eighteen possible demographic segments for each of the fourteen design features. While the segmentation of the sample by demographics did uncover some ranking group differences within the sample, two general observations should be made. First, no demographic group ranked any feature drastically different than the overall ranking groups. Drastic changes in ranking groups (from very important to not very important; from not very important to very important) did not occur for any design feature within any demographic segment. Second, as indicated in the Table 3, assignments of features to the ranking groups were very consistent across all eighteen demographic segments.

Of the 252 possible ranking group assignments (18 segments times 14 features), only 35 differed from the assignment based on the overall sample. From a statistical perspective, the idea is to analyze uncertain data to elicit repeatable patterns for predicting future behavior. It is obvious that the ranking group assignments, although uncertain in terms of variation, elicit clearly repeatable patterns in terms of the level of importance given

TABLE 3 RANKING GROUP ASSIGNMENT FREQUENCIES				
Design Feature	Overall Ranking Group	Segments Ranking Feature in Group 1	Segments Ranking Feature in Group 2	Segments Ranking Feature in Group 3
Class Discussion/Participation	1a	18	0	0
Material/Test Relationship	1b	17	1	0
Delivery style	1b	16	2	0
Attendance Policy	1c	12	6	0
Out of Class Work	1c	12	6	0
Group Projects	2	3	15	0
Use of Technology	2	4	10	4
Research Paper	3a	0	7	11
Test Format	3a	0	1	17
Grade Expectations	3b	0	1	17
Topics/Test	3b	0	0	18
Final Exam Coverage	3c	0	0	18
Grade % - Group Projects	3c	0	0	18
Grade % - Final Exam	3d	0	0	18

to these fourteen faculty-controllable course design features.

Design Feature Intensity

Table 4 indicates the customer preference for the intensity level (direction of influence) of each design feature. The favored intensity level is highlighted and italicized. As a basis for quantifying that intensity, 95% confidence intervals for each proportion and the associated p-values are listed. The intensity levels selected by employers indicate a clear preference for one intensity level over another for all but three of the design features. Except for those three features, at least 62% of the employers chose the same intensity level preference. The associated confidence intervals indicate that the preferred choice is a statistical majority of those sampled (all p-values are < 0.007). Employers did not indicate a clear preference (p-values > 0.05) for the remaining three course design features.

Similar to the overall rankings, the sample was partitioned based on the demographic data. A standard ANOVA with Tukey's 95% simultaneous confidence intervals was used for each category of demographic data. Employers generally agree on the preferred intensity levels.

No differences were found based on gender or the functional orientation of the employers (all p-values > 0.05). Only two course design features showed statistical differences in intensity levels preferences. Compulsory participation was statistically more preferred by those employers with ten or more years of experience, while those with less than ten years of experience were indifferent (p-value =0.049). The other feature that exhibited demographically based statistical differences was the amount of out of class work (all p-values < 0.001). More out of class work was preferred by those with more than 30 years of experience, a graduate degree, or an executive position. Less out of class work was preferred by those with less than twenty years of experience. Employers were indifferent when their backgrounds included 20-29 years of experience, no graduate degree, or an entry/middle level position.

While some of the partitioned results show statistically significant differences, they do not change the practical application of intensity levels in course design. The only practical conclusion of

Items (rank-ordered)	**Intensity 1 & Intensity 2**	**Intensity 1 Proportion**	**Intensity 1 99% C.I.**	**p-values**
Class Participation	Voluntary/*Compulsory*	0.373	(0.286,0.467)	< 0.007
Material/Test Relationship	Test repeats material/*Analytical thinking*	0.314	(0.231,0.405)	< 0.001
Delivery Style	Lecture only/*Variety*	0.025	(0.005,0.073)	< 0.001
Attendance Policy	*Required*/Optional	0.864	(0.789,0.920)	< 0.001
Out of Class Work	<0.5 hrs. per class/*2 hrs. per class*	0.373	(0.286,0.467)	< 0.001
Group Projects	*Required*/Not required	0.814	(0.731,0.879)	< 0.001
Use of Technology	**Frequent**/Seldom	0.907	(0.839,0.953)	< 0.001
Research paper	*Required*/Not required	0.720	(0.630,0.799)	< 0.001
Test Format	Objective (MC/TF)/*Subjective*	0.297	(0.216,0.388)	< 0.001
Grade Expectations	*A* or B	0.525	(0.431,0.618)	< 0.645
Topics per Test	*2-4 per test*/5-7 per test	0.814	(0.731,0.879)	< 0.001
Final Exam Coverage	*Comprehensive*/Non-comprehensive	0.780	(0.694,0.851)	< 0.001
Group Projects Grade %	40% or *0%*	0.424	(0.333,0.518)	< 0.117
Final Exam Grade %	40% or *10%*	0.407	(0.317,0.501)	< 0.053

TABLE 4
COURSE DESIGN FEATURE INTENSITY BY RANKING

these results is that the indicated preferences for intensity levels are common for all employers, but critical to some.

Supply Chain Implications

Given the somewhat tenuous (and inadequately operationalized) supply chain linkage between academia and business inferred from previous research studies, closing the gap between the suppliers' output (student skills and knowledge developed in courses) and the customers' expectations of desired input (transferable and knowledge based skills) would seem important to both parties. In this particular survey, the statistical results from employers regarding course design features have indicated the basic order of feature preferences that would build value into future employees. It is important to note here that the rankings and intensity preferences of the course design features operationally mimic the priorities of transferable skills and subject skills already identified in existing literature.

Based on the concept that the supplier (business faculty of academic institutions) should focus on increasing value to the customer (in this case, the business stakeholder), by appropriately manipulating course design features to build customer value. Thus, responding appropriately to the preferences of the business stakeholder would seem logical. Some may argue however that the business stakeholder is not the sole stakeholder that universities need to consider, but employers are obviously one important stakeholder. Other stakeholders may need to be considered, including the student paying tuition, accrediting agencies, society in general, and other funding sources such as state legislatures. In some cases, conflicts in stakeholder wishes may arise. For example, businesses ranked mandatory class participation as the most important design feature and intensity level. Evidently, developing the culture of the active verbal and nonverbal participation is seen as critically important in business success. However, according to Knight and Tracy (2007), the student stakeholder that pays tuition to the supplier (college) in the supply chain ranked class participation as eight in importance out of 14 criteria and overwhelmingly preferred voluntary class participation (87.4%).

Given this information about the importance of course design parameters, businesses should attempt to utilize their collective influence on academic accrediting agencies to foster human resource supply chain improvements. Employers could begin to lobby accrediting agencies to implement plans for encouraging development of measures for accreditation and auditing compliance with those measures consistent with desired transferable skills as well as subject skills. Some improvements might deal with issues of course content (e.g. a tax accounting course for accounting majors), but more emphasis would likely be on fostering programs of mandatory class participation, more analytical testing of class material, greater variety in delivery styles of material, required attendance policies and measures of greater quantities of out of class work. Likewise, businesses should encourage the emphasis toward these features rather than the current emphasis placed on grading, grading format, final exam coverage, and other related topics. The data clearly indicate that course design parameters related to the development of participatory skills, work ethic, and delivery style are far more important than concentration on grading and quantitative grading instruments. Some would argue that grades do matter to businesses as some even set minimum GPA's for interviewing prospective students as mentioned in Bills (1988) and Walters (1995). Employers typically do not advocate eliminating the emphasis on grades, but rather the data imply they are just not as important as the development of transferable skill sets fostered by judicious choices regarding course design features.

In addition, businesses should become more involved in developing a closer supply chain relationship with selected institutions that design courses that focus on the development of important transferable social, communication, and analytical skills while integrating the learning of those techniques into the educational body of appropriate subject skills/knowledge. These linkages should be enhanced through advisory boards and defined agendas for program expectations presented to college employment offices where the company plans to recruit prospective employees.

Meanwhile, the supplier (professors and the educational institution) must now face the challenge of assessing this new ranked information on course design parameters and make major changes to implement these concepts so as to prepare better students for the customer. This paper doesn't strive to be prescriptive in detailing the specifics of how each school should integrate these concepts into various classes nor does the paper attempt to prescribe the degree of conformance to business preferences over other stakeholder preferences.

Several issues do seem important however. First, colleges and their administration will have to be aware of the tremendous effort required to redesign classroom experiences and to reeducate faculty on effective means for developing and delivering the educational experience businesses suggest they prefer. Many college classes have historically relied heavily on the lecture format with minimal classroom participation from students. To expect a faculty entrenched in years of teaching in one mode to switch easily to another without training and assistance is a recipe for failure. Many faculty may need additional training while some will need release time for actual course development time. Administrators will need to decide whether their primary customer is the business supply chain or whether their customer is a mixture of various stakeholders with many competing objectives.

Conclusions, Limitations, and Further Research

Judicious choices among course design features can be effective in closing the gap between the learned skills and attributes of business graduates and the skills and attributes desired by the predominant supply chain customers, businesses seeking those graduates. Course design features (now operationalized in terms of the priorities of employers) that encourage transferable skill development such as active participation and analytical thinking are preferred by businesses for long term employability of graduates. Course design features that focus on short term grading issues (more oriented toward subject skills) seem relatively less important in the long term, although they may be important as a threshold

value when businesses decide which potential employees to interview. Obviously, other stakeholder preferences need to be considered by the supplier of college graduates. In that light, further analysis of the value drivers of other significant stakeholders needs to be performed so that a more balanced perspective on course design can be implemented.

The focus of this paper has been on course design using a sample of businesses located with the geographical region of a regional university. While the results and implications are clear, additional exploration needs to be done using a larger and more geographically diverse business population to see if the results can be generalized. These results should also be evaluated in light of design preferences of other major stakeholders such as students, graduate schools, and state funding agencies.

Bibliography

Abuhilal, L, Rabadi, G, and Sousa-Poza, A (2006). Supply chain inventory control: A comparison among JIT, MRP, and MRP with information sharing using simulation, *Engineering Management Journal*. 18 (2), 51-57.

Babad, E and Tayeb, A (2003). Experimental analysis of students' course selection. *British Journal of Educational Psychology*. 73(3), 373.

Bills, DB (1988). Educational credentials and promotions: Does schooling do more than get you in the door? *Sociology of Education*. 61 (1), 52-60.

Collier, B and Wilson, MJ (1994). Fortune 1,000 chief financial officers on business school education. *Financial Practice and Education*. 4 (2), 47-58.

Cox, S and King, D (2006). Skill sets: An approach to embed employability in course de-

sign. *Education and Training*. 48 (4), 262-274.

d'Appolonia, S and Abrami, P (1997). Navigating student ratings of instruction. *American Psychologist*. 52, 1198-1208.

Graham, L and Drueger, T (1996). What does a graduate need?: Conflicts in CFO and student opinions. *Financial Practice and Education*. 6 (2), 60-67.

Greenwald, A and Gillmore, S (1997). No pain, no gain? The importance of measuring course workload in student ratings of instruction. *Journal of Educational Psychology*. 89, 743-751.

Greenwald, A and Gillmore, S (1997). Validity concerns and usefulness of student ratings of instruction. *American Psychologist*. 52, 1182-1186.

Hahn, G and Meeker, W (1993). Assumptions of statistical inference. *The American Statistician*. 47 (1), 1-11.

Harvey, L, Moon, S and Geall, V (1997), "Graduates' work: organizational change and students' attributes 1997", available at www. uce. ac.uk/crq/publications/gw/ gwcon.html.

Kim, J and Balakrishnan, N (2005). Nonparametric tests for independence between lifetimes and covariates from censored bivariate normal samples. *Communications in Statistics: Simulation and Computation*. 34 (3), 685-710.

Knight, J and Tracy DL (2007). Value drivers in course design: A student stakeholder perspective. Working paper, University of Tennessee at Martin.

Lehmann, E and D'Abrera, H (1998). *Nonparametrics: Statistical methods based on ranks* (revised ed.). Upper Saddle River, New Jersey: Prentice Hall.

Martin, E (1989). The relationship among college student characteristics and their assigned importance to dimensions of course choices information. *Journal of College Student Development*. 30, 69-76.

McKeachie, W (1997). Student Ratings: The validity of use. *American Psychologist*, 52, 1218-1225.

Neumann, BR and Banghart S (2001). Industry-university 'consultantships': An implementation guide. *International Journal of Educational Management*. 15 (1), 7-11.

Spearman, C (1904). The proof and measurement of association between two things. *American Journal of Psychology*. 5, 72-101.

Stueck, W (1997). Smart, yeah, but can he talk? *BC Business*. 25 (9), 13-19.

The lion of lean: An interview with James Womack (2005). *Supply Chain Management Review. 9 (5), 28.*

Theall, M and Franklin, J (1990). Student ratings of instruction: Issues for improving practice. *New Directions for Teaching and Learning*. 43, San Francisco: Jossey-Bass.

Walters, LS (1995). Making the grade only gets you a foot in the corporate door. *Christian Science Monitor*. 88 (23), 1.

Weisz, M (2000). Developing a measure of student attributes. *Journal of Cooperative Education*. 35 (2/3), 33-41.

EMPLOYER SURVEY INSTRUCTIONS: Review the 14 course design features and then rank the order of preference with 1 being the item most important to you in designing a business course. Mark by your second choice, a 3 by the third choice, and finally a 14 by the item least important to you in a course design feature. Once the ranking has been completed, mark a checkmark in the box to indicate desired preference for each design feature. Finally, please complete the demographic information belo the survey.

Item No.	COURSE DESIGN FEATURE	RANK	Design Feature Preferences		
			Indicate your preference by checking one of the boxes each course design feature.		
1	Number of topics/chapters per test		2- to 4 chapters/test		5-7 chapters/test
2	Delivery style		Lecture only		Variety of activities, discussion, lecture, examples
3	Attendance policy		Attendance required		Optional attendance
4	Test format		Objective (MC/TF)		Subjective (Essays, problems)
5	Research paper		Research paper required		No research paper required
6	Out of class work (readings, assignments, etc.)		0-½ hrs/ class period		2 hrs/class period
7	Grade expectations		A		B
8	Use of Technology (Blackboard, Power point, etc.)		Frequent		Seldom
9	Class material/ test material relationship		Tests repeat class material		Tests require analytical thinking
10	Class discussion/ participation expectations		Voluntary participation		Compulsory participation
11	Final exam coverage		Comprehensive final		Non-comprehensive final (unit test)
12	% of grade based on final exam		40%		10%
13	Group projects		Required		Not required
14	% of grade based on group projects		40%		10%

Demographic Information

1) Gender: _____   2) Yrs. of Experience in Business: _____   3) Number of Subordinates _____

4) Current Position (check one): Entry/Middle Management _____   Executive _____

5) Level of Education (check one):

　　　Less than BS/BA Degree _____   BS/BA Degree _____   Grad. Degree _____

6) Type of Department (check one):

　　　Management _____   Accounting/Finance _____   Marketing/Sales _____   Other _____

Academic Grades:
Does Race or Gender Matter?

Kimberly Richburg
Lander University
Greenwood, SC 29649

Willis Lewis
Winthrop University
Rock Hill, SC 29733

Karie Barbour
Lander University
Greenwood, SC 29649

W. Royce Caines
Southern Wesleyan University
Central, SC 29630

ABSTRACT

This paper focuses on the issue of race and gender effects as related to course grades received by 778 students in 30 different classes at a small regional university. The results indicate that both gender and race are related to grade received. However, further analysis indicates that gender effects are no longer significant after adjustments for academic ability (as measured by previous GPA) are made. Importantly, the race effects are still significant after adjustments are made for academic ability. Thus the results of the paper indicate that it may be appropriate to consider what strategies are used to serve students of different racial groups.

Introduction

The issue of grades can be a very sensitive topic for college instructors. Most college professors assert that the demographic characteristics of the student have no impact on the grade received. Some may admit that academic preparation and support may affect different populations differently but few are willing to test to see if demographic characteristics like race and gender are significantly related to grades received by students.

There has been a good deal of research into issues of bias based on political issues, but few studies have been completed that provide a relatively easy process to see if grades are independent of race or gender at the college level. The focus of this paper is to propose a simple analysis that can be done by individual faculty members or disciplines or colleges to determine if there is a race or gender

factor in grades earned in their classes. There is no effort to ascertain what might be causing any effect if it exists. Rather the goal is to provide a fairly simple system for checking for independence of grades and race and gender.

Review of Relevant Literature

A considerable amount of previous research has explored the relationship of student characteristics such as gender and race to academic achievement in higher education. However, the vast majority of such studies have used measures other than course grades—such as enrollment figures, degree attainment figures, and grade point averages—as the measures of academic achievement. Overall, the research suggests there is a "gender gap" in higher education in that the overall performance of women in higher education tends to supersede that of men in several respects. Name-

ly, women are more likely than men to both be enrolled in college and receive Bachelor's degrees (National Center for Education Statistics 2004). Women also tend to have higher grade point averages than do men [7][9][14][17][19][31]. There is no general consensus in the literature on the explanations for such observations. However, some of the commonly proposed explanations pertain to the differences between men and women's college work ethic [7][18][21], differences in men and women's notions of the payoffs of a college education [6][8][24] and women's levels of preparedness for college [8].

As is the case with regard to gender, much of the research pertaining to the relationship between race and collegiate academic achievement uses factors other than course grades to measure academic achievement. Overall, the academic achievement of African Americans tends to be lower than that of Caucasians in several respects. A lower percentage of African Americans than Caucasians are enrolled in college and a higher percentage of African Americans students than Caucasian students drop out of college (National Center for Education Statistics 2004). Additionally, African Americans tend to have lower grade point averages than do Caucasians [6][12][26]. There is no consensus in the literature with regard to the explanations for such findings. However, some of the commonly proposed explanations pertain to relatively lower levels of academic preparedness for college among African American college students [10], perceptions of lack of support and feelings of alienation by African American students at predominantly white institutions [13][15][28] and greater demands and stress pertaining to family related issues [6].

As stated earlier, a much more limited body of research has investigated the existence of gender effects on academic performance by examining grades received by students in college courses. Several of these studies examining the existence of gender effects fail to find any significant differences in the grades earned from courses by women and men. For instance, Borde's [3] study of several sections of an introductory marketing course, found that there were no significant differences in the course grade received by men and women. Likewise, in their analysis of grades

received by freshmen in 290 different courses, Keller, Crouse, and Trusheim [16] found that there were no significant differences in the grades according to gender.

However, results from other studies suggest that there are gender effects with regard to grades received in courses—usually that women tend to receive higher course grades than men. Several studies examining grades received in college mathematics courses found that women received grades that were higher than those received by men [4][23]. Further, other research studies have yielded results indicating that women received higher grades in accounting [20] and a variety of other courses [16]. These findings are consistent with the previously referred to finding that female college students have higher overall grade point averages than male college students.

Alternatively, some studies find that men tend to perform better in a few courses [16]. In particular, the results of some studies have shown that men tend to perform better in introductory economics classes than women [1][25]. One study found that men received better grades in an introductory economics course than did women, but that those differences disappeared when the prior attitudes of the students toward economics were taken into account [2]. However, other studies have failed to find significant differences in the grades received by men and women in upper level economics classes [29].

Even less attention has been given to the relationship between race and grades received from college courses. As pointed out earlier, the vast majority of the research investigating the relationship between race and academic performance uses factors other than course grades as indicators of academic achievement. One study [27] examining the academic performances of African American and Caucasian students in developmental mathematics courses at a four-year university revealed there was a relationship between race and the grades received in the courses. The African American students received lower grades in the two courses than Caucasian students.

Methodology

This study is a review of grades for four different professors covering a total of 3Ø classes with 778 students. Two professors are male and two are female. One of each gender is White, the other two are African-American. The courses include lower level and upper level and also include three different disciplines. The results are not sufficiently large to generalize across all faculty members but rather are useful to suggest a systematic way to check for race and/or gender effects. The impetus for this study was intermittent observations that grades appeared to differ based on race and/or gender for students at a small regional university.

This study is limited to gender and two race classifications. Other demographic characteristics could be used but these categories seem to be the most at issue for this study. At the institution that provided the data, the vast majority of the students are either Caucasian or African-American. Other minorities make up less than five percentage of the total student body with no one group having a significant portion.

The study uses a simple Chi-Square test for Independence to check whether there is independence between the grade received and race or gender. This requires two contingency tables, one with the rows indicating the race and the columns representing grades. The second table lists gender in the rows and the columns representing the grades. In each case, the contingency table is 2 x 5 and the resulting Chi-Square test indicates whether the independence of the factors can be accepted or rejected.

The simple contingency table allows only a test for the independence of grades and either gender or race. This simple test is not sufficient because there is not a check for "academic ability' differences. As a result, the students were further categorized by prior academic performance as measured by GPA which allowed an adjustment for academic ability (as measured by GPA).

The focus of the paper is not to try to explain all the implications of differential academic performance by different demographic groups. Rather the focus is on suggesting a fairly simple procedure whereby faculty members and administrators can check to see if certain groups are earning significantly different grades. If those differences are found, then an effort can be justified to try to discover whether alternative methods might be used that would assist the group having more difficulty earning a "fair" share of the grades.

Results for the Gender Effect

The chi-square test of Independence allows the researchers to determine if two independent variables occur independently of each other. The null hypothesis is rejected if a relatively large chi-square value and a small corresponding p-value is observed. There are 778 observations in the sample. In Table 1, the null hypothesis and alternative hypotheses can be stated as:

Ho: There is no relationship between gender and course grade earned,

H_1: There is a relationship between gender and course grade earned.

TABLE 1 CONTINGENCY TABLE FOR GRADES AND GENDER						
	A	**B**	**C**	**D**	**F**	**Total**
Female	76	128	13Ø	45	31	41Ø
Male	51	1Ø4	121	38	54	368
Total	127	232	251	83	85	778
Chi-Square	12.3Ø9					
Df	4					
p-value	Ø.Ø15*					
*Significant at .Ø5 level						

The contingency table and Chi-square test results are shown in Table 1. As shown the null hypothesis is rejected at the .Ø5 level of significance. Thus we conclude there is a relationship between gender and the grade earned in the classes observed in this study.

By dividing the data by prior GPA, an effort is made to adjust for academic ability. Given this new categorization, further analysis can be completed to determine if there is an effect of gender after accounting for differences in academic performance prior to taking the class. This requires a series of three tests for gender by GPA groups.

There is a new set of three null and alternative hypotheses related to gender.

Ho: Among students who have a prior GPA > 3.Ø, there is no relationship between grades earned and the gender of the student.

H_1: Among students who have a prior GPA > 3.Ø, there is a relationship between grades earned and the gender of the student.

Ho: Among students who have a prior GPA of 2.Ø -3.Ø, there is no relationship between grades earned and the gender of the student.

H_1: Among students who have a prior GPA of 2.Ø-3.Ø, there is a relationship between grades earned and the gender of the student.

Ho: Among students who have a prior GPA < 2.Ø, there is no relationship between grades earned and the gender of the student.

H_1: Among students who have a prior GPA < 2.Ø, there is a relationship between the course grade earned and the gender of the student.

As shown in Table 2, the null hypothesis is not rejected for any of the groups and we conclude that there is not a relationship between gender GPA level and grade earned in the course after

we adjust for academic ability as measured by GPA prior to entering the course. This tends to indicate that it is previous academic performance (which we have used as a proxy for academic ability) that is the important relationship not the gender of the student.

Results for the Race Effect

To test the relationship of race to grades earned, the null and alternative hypotheses are stated as:

Ho: There is no relationship between race and course grade earned

H_1: There is a relationship between race and course grade earned.

The contingency table and Chi-square test results are shown in Table 3. As shown the null hypothesis is rejected at the .Ø1 level of significance. Thus we conclude there is a relationship between race and the grade earned in the classes observed in this study

To adjust for academic ability the students were further categorized by GPA to serve as a proxy for academic ability just as was done to investigate gender effects. The new categories are shown below in Table 4. Students are now compared with their academic performance group to adjust for the potential differences in academic background of the students.

There is a new set of three null and alternative hypotheses related to race.

Ho: Among students who have a prior GPA > 3.Ø, there is no relationship between grades earned and the race of the student.

H_1: Among students who have a prior GPA > 3.Ø, there is a relationship between grades earned and the race of the student.

Ho: Among students who have a prior GPA of 2.Ø -3.Ø, there is no relationship between grades earned and the race of the student.

H$_1$: Among students who have a prior GPA of 2.Ø-3.Ø, there is a relationship between grades earned and the race of the student.

Ho: Among students who have a prior GPA < 2.Ø, there is no relationship between grades earned and the race of the student.

H$_1$: Among students who have a prior GPA < 2.Ø, there is a relationship between the course grade earned and the race of the student.

TABLE 2 CONTINGENCY TABLE COMPARING GRADES AND GENDER ADJUSTED FOR GPA						
	A	**B**	**C**	**D**	**F**	**Total**
Female >3.Ø	61	35	11	5	3	115
Male >3.Ø	27	26	8	Ø	Ø	61
Total	88	61	19	5	3	178
Chi-Square	37.Ø137					
Df	4					
p-value	.134					
	A	**B**	**C**	**D**	**F**	**Total**
Female 2.Ø-3.Ø	15	86	93	25	12	231
Male 2.Ø-3.Ø	21	26	8	Ø	Ø	21Ø
Total	88	67	79	25	18	431
Chi-Square	4.7Ø97					
df	4					
p-value	.318					
	A	**B**	**C**	**D**	**F**	**Total**
Female <2.Ø	Ø	7	26	15	16	64
Male<2.Ø	3	11	34	13	36	97
Total	3	18	6Ø	28	52	161
Chi-Square	6.231					
df	4					
p-value	.178					

TABLE 3 CONTINGENCY TABLE FOR GRADES AND RACE						
	A	**B**	**C**	**D**	**F**	**Total**
Black	14	43	89	23	22	191
White	113	189	162	6Ø	63	587
Total	127	232	251	83	85	778
Chi-Square	33.729					
Df	4					
p-value	.ØØØ**					
** Significant at .Ø1 level						

	A	B	C	D	F	Total
TABLE 4 CONTINGENCY TABLE COMPARING GRADES AND RACE ADJUSTED FOR GPA						
	A	**B**	**C**	**D**	**F**	**Total**
Black >3.0	9	8	8	1	0	26
White >3.0	79	53	11	4	3	150
Total	88	61	19	5	3	176
Chi-Square	13.497					
Df	4					
p-value	.009**					
	A	**B**	**C**	**D**	**F**	**Total**
Black 2.0-3.0	4	32	57	11	9	113
White 2.0-3.0	32	121	115	39	21	328
Total	36	153	172	50	30	441
Chi-Square	11.5025					
Df	4					
p-value	.021*					
	A	**B**	**C**	**D**	**F**	**Total**
Black <2.0	1	3	24	11	13	52
White <2.0	2	15	36	17	39	109
Total	3	18	60	28	52	161
Chi-Square	5.5324					
Df	4					
p-value	.237					

* Significant at .05 level
** Significant at .01 level

Conclusions

The results as shown in Table 4 are different than those found for the gender effect. After adjusting for prior grades, there appears to still be a lack of independence between the race of the student and the course grade earned for both the higher ability and average ability students.

However, for the lower performing students, the race effect does disappear when previous academic performance is adjusted for. The question remains as to why this would be true and that requires more depth than this research aspires to do. However, this result does indicate that it may be necessary to research the issue in more depth to develop a strategy to deal with the issue of the race effect.

Based on the data available, it appears that there is a relationship between gender of the student and the grade received in these classes and the race of the student and the grades received in these classes. However, when the students are further stratified by GPA level, the results imply that the relationship between gender and grades may be primarily due to the academic ability level of the student rather than the gender. That is not the case for the race effect. Adjusting for academic ability does not clear the significant relationship between academic grades and race. Further analysis beyond the simple Chi-Square test for independence may yield further insights into why students of different status tend to perform differently in these classes. As stated in the introduction, our main goal is to offer a method

of analysis for college instructors to use in order to test for patterns of course grades that are related to race and gender. Also, by analyzing race and gender effects for college courses in multiple fields—economics and political science classes—we add to the literature examining race and gender effects in courses grades.

References

[1] Ballard, Charles L. and Marianne F. Johnson, "Basic Math Skills and Performance in Introductory Economics Class," *Journal of Economic Education*, 2004, Vol. 35, No. 1, pp. 3-23.

[2] Ballard, Charles and Marianne Johnson, "Gender, Expectations, and Grades in Introductory Microeconomics at US University," *Feminist Economics*, 2005, Vol. 11, No. 1, pp. 95-122.

[3] Borde, Stephen F., "Predictors of Student Academic Performance in the Introductory Marketing Course," *Journal of Education for Business*, 1998, Vol. 73, No. 5, pp. 302-306.

[4] Bridgeman, Brent and Cathy Wendler, "Gender Differences in Predictor of College Mathematics Performance and in College Mathematics Course Grades," *Journal of Educational Psychology*, 1991, Vol. 83, No. 2, pp. 275-284.

[5] Charles, Camille Z., Gniesha Dinwiddie, and Douglas S. Massey, "The Continuing Consequences of Segregation: Family Stress and College Academic Performance," *Social Science Quarterly*, 2004, No. 85, No. 5, pp. 1353-1373.

[6] Charles, K.K. and M.C. Luoh, "Gender Differences I Completed Schooling," *Review of Economics and Statistics*, 2003, Vol. 85, pp. 559-577.

[7] Chee, Kyong Hee, Nathan W. Pino, and William L. Smith, "Gender Differences in the Academic and Ethic and Academic Achievement," *College Student Journal*, 2005, Vol. 39, Issue 3, pp. 604-618.

[8] Cho, Donghun, "The Role of High School Performance in Explaining Women's Rising College Enrollment," *Economics of Education Review*, 2007, Vol. 26, No. 4, pp. 450-462.

[9] Debarard, M. Scott, Glen I. Spielmans and Deana C. Julka, "Predictors of Academic Achievement and Retention among College Freshmen: A Longitudinal Study," *College Student Journal*, 2004, Vol. 38, Issue 1.

[10] Hershberger, Scott L. and Anthony R. D'Qugelli, "The Relationship of Academic Performance and Social Support to Graduation among African-American and White University Students: A Path-Analytic Model," *Journal of Community Psychology*, 1992, Vol. 20, pp. 188-199.

[12] Farkas, G. and L. Hotchkiss, "Incentives and Disincentive for Subject Matter Difficulty and Student Effort: Course Grade Correlates Across the Stratification System," *Economics of Education Review*, 1989, Vol. 8, No. 2, pp. 121-132.

[13] Fleming, J., *Blacks in College*, 1984, San Francisco: Jossey-Bass.

[14] Jansen, P.W.A. Ellen and Marjon Bruinsma, "Explaining Achievement in Higher Education," *Educational Research and Evaluation*, 2005, Vol. 11, No. 3, pp. 235-255.

[15] Jay, G.M. and D'Augelli, A.R., "Social Support and Adjustment to University Life: A Comparison of African-American and White Freshmen." *Journal of Community Psychology*, 1991, Vol. 19, pp.95-108.

[16] Keller, Dana, James Crouse, and Dale Trusheim, "Relationships among Gender Differences in Freshman Course Grades and Course Characteristics," *Journal of Educational Psychology*, 1993, Vol. 85, No. 4, pp. 702-709.

[17] Linn, R. I., "Admissions Testing: Recommended Uses, Validity, Differential Prediction and Coaching," *Applied Measurement in Education*, 1990, Vol. 3, pp. 297-318.

[18] Luzzo, D.A., "An Analysis of Gender and Ethnic Differences in College Students' commitment to Work," *Journal of Employment Counseling*, 1994, Vol. 31, pp. 38- 45.

[19] Mau, Wei-Cheng and Richard Lynn, "Gender Differences on the Scholastic Aptitude Test, the American College Test and College Grades," *Educational Psychology*, 2001, Vol. 21, No. 2, pp. 133-136.

[20] Mutchler, J.F., J.H. Turner, and D.D. Williams "The Performance of Female Versus Male Accounting Students," 1987, *Issues in Accounting Education*, Spring, pp. 103-111.

[21] Neville, D.S. and D.E. Super, "Career Maturity and Commitment to Work in University Students*," Journal of Vocational Behavior,* 1988, Vol. 32, pp. 139-151.

[22] National Center for Education Statistics, *U.S. Department of Education 2003-2004 National Postsecondary Student Aid Study.*

[23] Odell, Patricia M. and Phyllis Schumacher, "Attitudes Toward Mathematics and Predictors of College Mathematics Grades: Gender Differences in a 4-Year Business College," *Journal of Education for Business*, 1999, Vol.74, pp. 34-38.

[24] Poe, Marshall, "The Other Gender Gap," *Atlantic Monthly*, 2004, Vol. 293, Issue 1, pp.1072-7825.

[25] Robb, Roberta Edgecombe and A. Leslie Robb, "Gender and the Study of Economics: The Role of Gender of the Instructor," *Journal of Economic Education*, 1999, Vol. 31, No. 1, pp. 3-19.

[27] Van-Laar, C. J., J. Sidanius, J.L. Rabinowitz, and S. Sinclair, "The Three R's of Academic Achievement: Reading, Writing, and Racism," *Personality and Social Psychology Bulletin*, 1999, Vol. 25, 139-151.

[28] Walker, William and Maximino Plata, "Race/Gender/Age Differences in College Mathematics Students," *Journal of Developmental Education*, 2000, Vol. 23, Issue 3, pp. 24-29.

[29] Walton, Gregory M. and Geoffrey L. Cohen, "A Question of Belonging: Race, Social Fit, and Achievement," *Journal of Personality and Social Psychology*, 2007, Vol. 92, No. 1, pp. 82-96.

[30] Williams, Mary, Charles Waldauner, and Vijaya Duggal, "Gender Differences in Economic Knowledge: An Extension of the Analysis," *Journal of Economic Education*, 1992, Vol. 23, No. 3, pp. 219-231.

[31] Young, J. W., "Differential Prediction of College Grades by Gender and Ethnicity: A Replication Study," *Educational and Psychological Measurement*, 1994, Vol. 54, pp. 1022-1029.

An Examination of College Students' Awareness of Social Web Site Usage and Employability

Donna W. Luse

Associate Dean and Graduate Coordinator
Professor of Business Communications
College of Business Administration
University of Louisiana at Monroe

ABSTRACT

Social web site usage has increased dramatically over the last few years. Many of the registered users of MySpace and Facebook social web sites are college students, the Millennial generation. Although many college students are active networking participants on social web sites, these students may not realize the future implications, including future employment opportunities, of their involvement on these web sites. This study investigated student awareness of the affects of social web site usage on future employability. Results from this study showed over one-third of the respondents do not believe web site usage affects job-interviewing or job-hiring decisions. Furthermore, 42% of the student respondents indicated they do not believe web site usage affects employability.

Introduction and Purpose

The cyber-socializing revolution has increased dramatically with more than 100-million people worldwide becoming active participants in this digital age pastime ("Youth Drawn to Social Networking Web Sites," 2006). In July of 2006, of the more than 173 million unique monthly visitors who frequented social networking sites, the two most popular and frequently visited sites were MySpace and Facebook (SMugrabi, 2006). During this month, over 54.5 million unique users visited the No. 1 social-web site, MySpace, while over 14 million unique users visited the No. 2 site, Facebook (SMugrabi, 2006).

Of the visitors frequenting MySpace, more than 80% of the registered users are between the ages of 16 to 34 (Farnsworth, 2006). College students, often called the Millennial generation, are "all about networking" and make up one of the largest user groups on social web sites (Studinski, 2006). The two largest surges in MySpace usage are in September when college students return to school and December during finals (Studinski, 2006).

Although many college students are active networking participants on social web sites, these students may not realize the future implications, including future employment opportunities, of their involvement on these web sites. In today's recruiting age, "every potential employer could be watching you. Whether it's through a blog, online profile or Google search, digging for digital dirt has become part of the screening process for job applicants at companies of all sizes" (Correa, 2006). Since it takes little time to Google a person's name online, professional recruiters have been using this tool for years; and, today, more human resource departments and office managers are increasing the practice of using this technique for screening job applicants (Correa, 2006). "Increasingly, employers are scouring the Web and conducting instant background checks by simply plugging a candidate's name into Google" ("Your Profile on Social Sites...", 2007).

In a recent survey by the National Association of Colleges and Employers, about one-third of the respondents indicated they use social web sites in reviewing job candidates' profiles (Correa, 2006). ExecuNet, a well-known recruiting firm authority, reported in a recent poll that over three quarters of 102 responding

recruiters indicated they used search engines to uncover information about job candidates (Forster, 2006). Furthermore, a recent survey conducted by Robert Half International found that "two-thirds of executives polled believe professional networking web sites will prove useful in the search for job candidates in the next three years" (Harston, 2008).

One reason recruiters are using social web sites is to find the best job candidates while purging their candidate pool. ExecuNet's poll revealed that 35 percent of the recruiters had eliminated candidates from further employment consideration due to information uncovered online (Correa, 2006). Employers are using social web sites to ensure prospective candidates do not have inappropriate or objectionable content posted on their sites (Storey, 2007). As *Financial Post* (2007) reports, the Internet is becoming one of the first resources recruiters and hiring managers use to determine whether or not a candidate is a good fit for a company. However, although the use of social web sites as a source in recruiting is on the rise, a recent survey by Adecoo Workplace Insights found that "66% of Generation Y respondents were unaware that seemingly private photos, comments, and statements were audited by potential employers" ("Your Profile on Social Sites...", 2007).

Research indicates that it appears small technology oriented companies use online searches more frequently in the hiring process, while large companies rely on traditional resources to scrutinize candidates rather than taking the time to conduct online searches (Wickenheiser, 2006). Although many companies may not be using online searches exclusively in considering new hires since the online search concept and its impact on HR policies is still unfolding (Wickenheiser, 2006), research suggests that college students need to be aware of potential implications of their usage on social web sites and their future employment potential. This is especially true since estimates of the usage of this screening tool for college graduates' employment is on the rise. Steven Rothberg, president of CollegeRecruiter.com, estimates that 25 to 50 percent of college hiring recruiters will use MySpace and Facebook during the fall of 2006 for recruiting purposes (Jarboe, 2006).

Thus, as more and more college students increase their usage of social web sites, the question arises as to whether or not students are aware of and understand the potential implications of web socializing on their future employability. Thus, the purpose of this study is to investigate whether college students are aware of the affects of web socializing on future employability.

Methodology

University students in both upper-level and lower-level business classes were surveyed to analyze student awareness of potential implications of web site socialization on future employability. Students in five sections of an upper-level business communication class were surveyed, while students in four sections of an introductory business class were surveyed. The survey instrument contained questions relating to the following: social web site usage, privacy settings usage and control, job-interviewing and job-hiring decision making, and demographic data.

Of the 209 respondents, 107 student respondents (51.2%) were in the upper-level business communication class, while 102 respondents (48.8%) were in the introductory business class. As seen in Exhibit 1, almost 60% of the respondents were seniors or juniors, while 40% were freshman or sophomores.

Exhibit 1 Classification of Student Survey Respondents		
Classification	**Number**	**Percentage**
Senior	65	31.1
Junior	6Ø	28.7
Sophomore	41	19.6
Freshman	41	19.6
Missing	2	1.Ø
Total	2Ø9	1ØØ.Ø

EXHIBIT 2
HOW LONG HAVE STUDENTS HAD A
MYSPACE OR FACEBOOK WEB SITE?

Use of MySpace Website?

0%
0%
6%
23%
39%
32%

- Do not have website
- Less than 1 yr
- 1 to less than 2 yrs
- 2 to less than 3 yrs
- 3 to less than 4 yrs
- More than 4 yrs

Use of Facebook Website?

0%
0%
1%
13%
33%
38%
15%

- Do not have website
- Less than 1 yr
- 1 to less than 2 yrs
- 2 to less than 3 yrs
- 3 to less than 4 yrs
- More than 4 yrs
- Missing
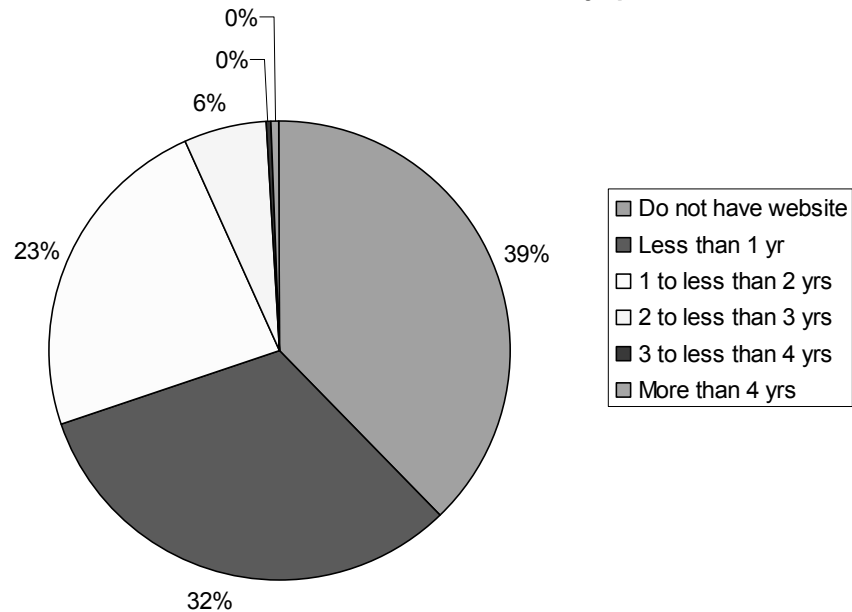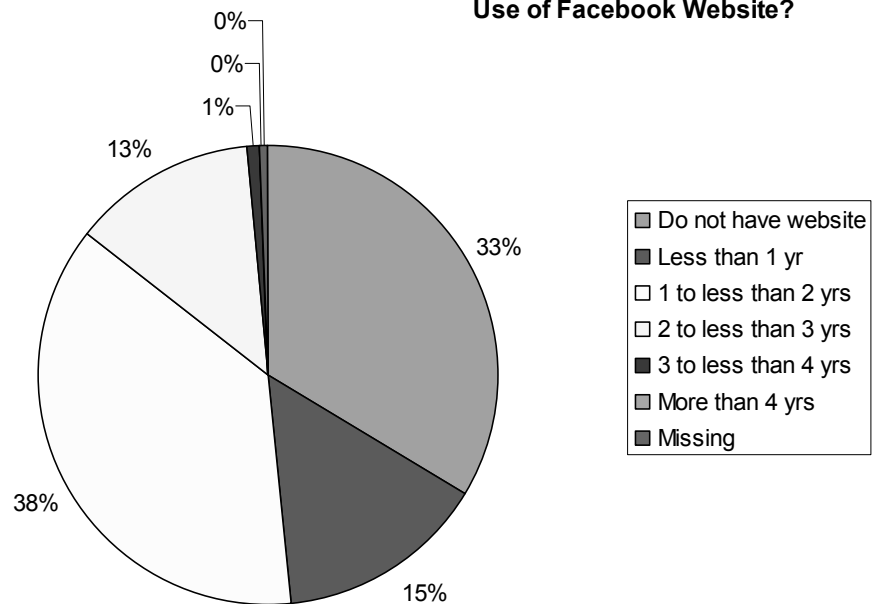
Results

Of the students who responded, over 1/2 of the students have had either a MySpace or Facebook account for less than two years, while about 1/3 or more did not have a social web site presence (see Exhibit 2). Cross tabulations showed that about the same number of freshmen, sophomores, juniors, and seniors had either a MySpace or Facebook web site for less than two years. Cross tabulations also indicated that more seniors than the other undergraduate student classifications did not have a MySpace or Facebook web site.

In looking at the usage of privacy settings to control access to social web sites, over half (51.2%) of the student respondents indicated they use privacy settings to control who can access their profile (see Exhibit 3). Over 2/3's of the respondents indicated they believe the privacy settings they set allow them to control who can access their profile.

Exhibit 4
Recruiters Use of Social Web Sites When Making Job-Interviewing Decisions

Exhibit 3
Use of Privacy Settings to Control Profile Access

Response	Frequency	Percent
Yes	1Ø7	51.2%
No	48	23.0%
Do not know	12	5.7%
Do not have Web site	39	18.7%
Missing	3	1.4%
Total	2Ø9	1ØØ.Ø%

When asked whether they believe recruiters use individuals' profiles posted on MySpace or Facebook Web sites when making job-interviewing decisions, over 1/3 of the respondents indicated they disagreed or strongly disagreed with this statement. As seen in Exhibit 4, more respondents (40%) w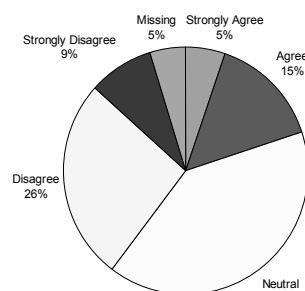ere neutral regarding this issue. Furthermore, over 1/3 of the respondents indicated they do not believe job-hiring decisions are made based on recruiters use of profiles posted on MySpace or Facebook Web sites, while more respondents

(36%) were neutral regarding this issue (see Exhibit 5). Although more student respondents indicated they did not believe recruiters use social web site profiles in making job-interviewing or job-hiring decisions, cross tabulations showed that more upper-level junior and senior respondents than lower-level freshman and sophomores indicated they believed recruiters use profiles from social web sites in the job search process.

Exhibit 5
Recruiters Use of Social Web Sites When Making Job-Hiring Decisions
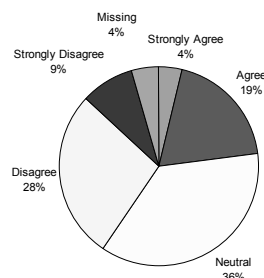
Overall, 40% of the student respondents do not believe (27% disagree and 13% strongly disagree) while 37% remain neutral regarding the affects MySpace or Facebook web sites may have on their potential employability (see Exhibit 6). Cross tabulations showed of the respondents more upper-level junior and

Exhibit 6
Affects of MySpace or Facebook
Web Sites on Potential Employability
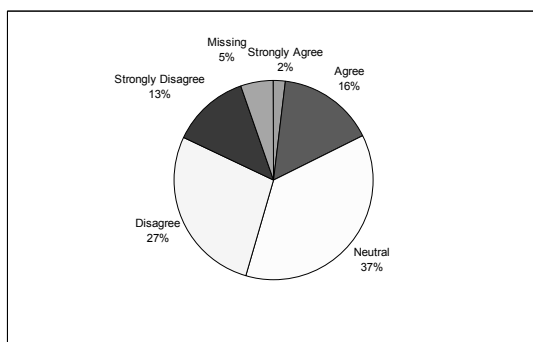
senior respondents than lower-level freshman and sophomores indicated they believed social web site profiles would affect their potential employability.

Summary and Conclusions

In investigating college students' usage of social web sites, such as MySpace and Facebook, this study found that a majority of the responding students have had either a MySpace or a Facebook web site for two years or less and use their privacy settings to control access to their profile. Although research indicates privacy settings cannot always control access to individual profiles, over 2/3's of the respondents believe privacy settings allow individuals to control who can access their profile web sites.

Furthermore, when investigating whether college students are aware of potential implications of web socializing on future employability, this study found that about 40% of the respondents were neutral while over one-third of the respondents do not believe web site usage affects job-interviewing or job-hiring decisions. This is further supported when over 42% of the student respondents indicated they do not believe web site usage affects employability, which is contradictory to current research.

In conclusion, while many college students are active social web site users, they are not aware that social web site usage may affect them when it comes to job-hiring decisions. This lack of knowledge by students of social web site usage and the affects this usage may have on their potential employability indicates professors need to be proactive in teaching students about the impact and potential influence social networking web sites may have on their future careers.

Bibliography

Bowman, Elizabeth. (2006, May 30). Facebook used as a hiring tool. *The Daily Universe.* Retrieved September 7, 2006, from http://web.lexis-nexis.com.

Correa, Barbara. (2006, August 19). Me, MySpace and I. *San Gabriel Valley Tribune (California).* Retrieved September 7, 2006, from http://web.lexis-nexis.com.

Farnsworth, Josh. (2006, May 15). Help wanted? MySpace does that, too; Popular social Web site plays job matchmaker. *Telegram & Gazette (Massachusetts).* Retrieved September 7, 2006, from http://web.lexis-nexis.com.

Forster, Julie. (2006, May 17). Bloggers beware: Employers are looking at personal Web sites to judge job seekers. *National Post's Financial Post & FP Investing (Canada).* Retrieved September 7, 2006, from http://web.lexis-nexis.com.

Harston, P.J. (2008, April 23). Recruiting from the Internet; make the most out of online networking. *The Toronto Sun.* Retrieved April 29, 2008 from http://web.lexis-nexis.com

Jarboe, Michelle. (2006, August 27). Job hunters, what's in your online profile??. *News & Record (Greensboro, NC).* Retrieved September 12, 2006, from http://web.lexis-nexis.com.

SMugrabi. (2006, September 7). Facebook users plan boycott. *Red Herring: The Business of Technology.* Retrieved September 12, 2006, from http://www.redherring.com.

Storey, Nancy (2007, April 16). Expert advice. *PR Week*. Retrieved April 29, 2008 from http://web.lexis-nexis.com

Studinski, David. (2006, September 12). MySpace, Facebook change how generation communicates. *University Wire*. Retrieved September 13, 2006, from http://web.lexis-nexis.com.

Wickenheiser, Matt. (2006, August 25). Job seekers: Beware your Web persona; More companies are turning to sites such as MySpace to research prospective employees. *Portland Press Herald (Maine)*. Retrieved September 7, 2006, from http://web.lexis-nexis.com.

Your profile on social sites can make or break your job opportunities (2007, September 19). *National Post*. Retrieved April 29, 2008 from http://web.lexis-nexis.com

Youth drawn to social networking Web sites. (2006, July 14). *Voice of America News*. Retrieved September 7, 2006, from http://web.lexis-nexis.com.

Distributed Expertise and Mixed-motives in Teams: A Team Leadership Development Simulation

Troy V. Mumford
College of Business
Colorado State University

ABSTRACT

Leaders within teams must harness the knowledge distributed across team members as well as consider each team member's motives for providing the information. A team simulation is presented for educators to use in helping students to learn and develop team leadership skills relating to this distributed-knowledge and mixed-motive context. Students are assigned roles in four-person executive teams and each member is given general information outlining a corporate buyout decision that the team must make. Each member also receives unique information about his or her functional area and motives. The challenge of the team is to properly utilize the distributed information while taking into account team member motives in order to make an effective decision. The paper provides research-based recommendations for managing the distributed-knowledge and mixed-motive context as well as providing suggestions for facilitating the simulation.

Introduction

Work teams have become a critical component of the organizational landscape, and leading those work teams has become an important ability for professionals throughout organizations. The team leadership role is made more challenging by the fact that team members are unique in both the knowledge and the motives that they bring to the team. Successful team leaders are able to recognize this distributed expertise and integrate it in order to make decisions and carry out the team's work. In addition, the team must integrate this expertise while dealing with the political biases or agendas of the individual team members. We can better prepare students to work in such leadership roles by exposing them to situations involving mixed-motives and distributed knowledge. The current paper is intended to help educators do this by providing a leadership development simulation that targets the distributed knowledge and mixed motive context.

The purpose of this paper is to advance learning through three contributions. First, it summarizes research on the distributed-expertise and mixed-motive phenomena in teams. Second, it provides recommendations for team members attempting to lead in that environment. Third, it presents a team simulation for developing the skills needed to manage distributed expertise and heterogeneous motives. While the simulation is broadly applicable to any field where collaboration is required, it is especially well-suited for advanced undergraduate or graduate courses in management education, in that it utilizes a business setting and draws upon knowledge of typical functional areas within an organization. Finally, guidelines for facilitating the simulation are provided. In sum, the paper is a valuable resource for educators of students who will be leaders in teams.

Distributed Expertise

The ubiquity of work teams has arisen, in part, due to the increased complexity of work (Cohen & Baily, 1997). As the complexity of the work environment increases, so does the depth of knowledge needed to solve business-related problems and make effective decisions. This depth of knowledge is often not found in any one person, and hence teams are utilized as a social structure for integrating the expertise of multiple subject matter experts, in order to apply the distributed knowledge to address the problems and decisions at hand (Henry, 1995).

The challenge is visually illustrated in Figure 1, where each circle represents a member of the team. The icons within the circle represent the knowledge held by that team member. Notice that all the knowledge can only be applied to the team's task if the team is able to pool the knowledge from each team member. In addition, the dotted lines forming the circles represent the motives that may facilitate (large openings) or hinder (small openings) the team members from sharing their knowledge.

The phenomenon of distributed expertise has been investigated by research in three different areas. First, research on distributed knowledge has investigated the extent to which team members are able to integrate the information that they each hold (Wittenbaum, 2000). This research indicates that, unfortunately, teams are not always effective integrators of information (Stasser, 1999), and decisions are frequently made based on only a fraction of the relevant information. Second, research on transactive memory suggests that team members possess a mental map of "who knows what" in the team (Moreland, 1999; Wegner, 1987). If team members are able to build an accurate map of knowledge within the team, it has been shown to be related to higher team performance (Austin, 2003). Third, the research on expert influence investigates if groups can recognize who is the most expert member, and if that member is allowed to influence the team (Libby,

Trotman, & Zimmer, 1987). This research uncovers a tendency in groups to assume that the most assertive or dominant group members are those that should have the greater influence (Littlepage, Robison, & Reddington, 1997).

Mixed-motives:

A second challenge faced by leaders in team environments is heterogeneity in the team member's motives and value orientations (Mohammed & Dumville, 2001). This is particularly true of cross functional teams where teams are composed of individual's who come from diverse functional backgrounds (Denison, Hart, & Kahn, 1996). Mixed-motives are important for two reasons. First, most definitions of team effectiveness contain a member satisfaction component (McGrath, 1991). If the process by which a team works together ignores the values and motives of the team members, it is less likely that the team will meet the team member's needs. Second, the information that is provided by any team member to the team may be influenced by the motives of that team member (Bunderson, 2003). Motives also influence how the individuals receive communicated information (Tenkasi & Boland, 1996). For example, if one member of a team believes that he/she will receive a promotion if another team member performs poorly, then a motivational conflict of interest is created.

FIGURE 1
THE DISTRIBUTED EXPERTISE AND MIXED-MOTIVES OF TEAM MEMBERS
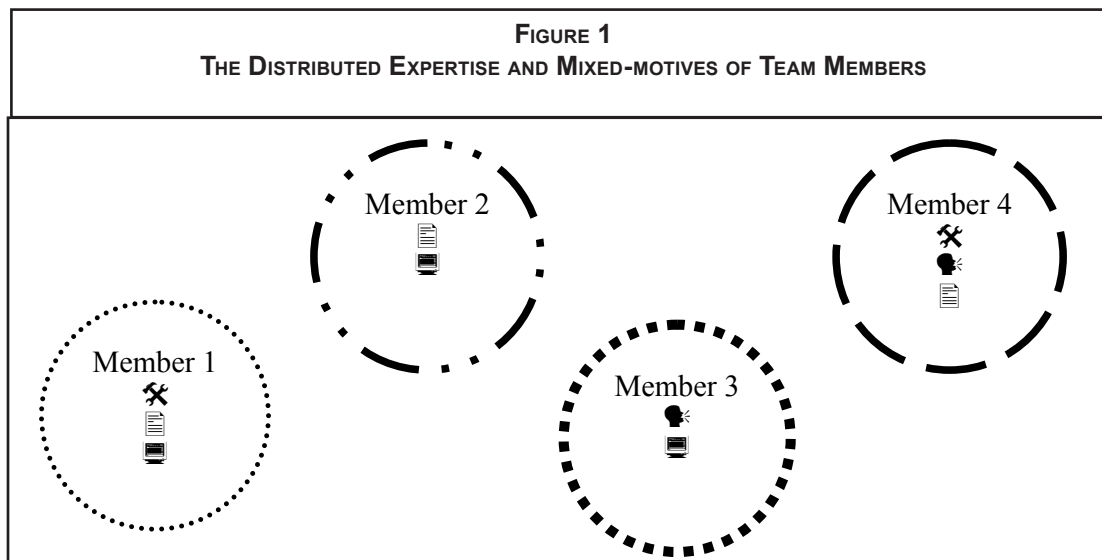
This could prove to be a barrier to information sharing within the team context.

This research on distributed expertise and mixed-motives illustrates two things. First, teams don't automatically have the ability to recognize differential expertise in the team and the motives that may bias the information that is shared in the team. And second, when teams are able to recognize the distribution of knowledge and motives then apply information in their group processes then their performance is increased.

How then, can we help students improve in their ability to act as leaders in this demanding team context? It would seem that that part of the answer to this question lies in team leadership. One of the roles of the team leader is to assure that the correct expertise is applied to any given problem that the team faces. This must occur in circumstances where, typically, the team leader does not have all the task-related knowledge. Instead, the knowledge is held by various team members and the team leader's role is to discover who has what knowledge and then provide task and social structure that allow that knowledge to be used on the task (Mumford, Campion, & Morgeson, 2006). The following team simulation was designed to expose students to a distributed-expertise and mixed-motive context to aid them in developing these team leadership skills.

Team Leader Expertise and Motive Management Simulation

Overview

The objective of the simulation is to expose the students to the distributed knowledge and mixed-motive context prevalent in team settings. Team leaders have the critical role of recognizing the distribution of expertise among the team members and facilitating the integration of the expertise in completing the team's work. In addition, leaders must be aware of the various motives (attitudes, beliefs, values, & agendas) possessed by each team member in order to interpret information and help the team make effective decisions.

This simulation provides an opportunity for students to interact in a realistic decision-making context that contains heterogeneity of motives and resources among the team members. That is, students are given the opportunity to interact in a realistic decision making case, designed to simulate an executive team environment with each member having unique information and unique motives or agendas. The simulation takes approximately 50 minutes to complete.

Simulation Description:

Step 1:
Explanation and Guidance – 10 minutes

The students are taught the concepts of distributed-expertise and mixed-motives and the implications that they have for working in teams. This step may be used in two different ways. If the instructor would like to use the simulation as practice for skills that have been taught, then this step would be done first. Alternatively, if the instructor would like to use the simulation as a means to illustrate the importance of gaining the skills, then this step would be incorporated into the end of the simulation. The realism of simulation is increased with the second option.

In addition to the explanation of the concepts discussed in the beginning of this paper, there are several recommendations that can be given to students on how to manage distributed expertise and mixed-motives. These recommendations are listed below:

- ▸ Signal your areas of expertise to the group so they are aware of your expertise
- ▸ Monitor the group for signals of expertise from team members
- ▸ Solicit information on team member's areas of expertise
- ▸ Perform a gate-keeping role to ensure that all member's views are heard
- ▸ Create and reinforce group norms for justifying positions and decisions
- ▸ Act to decentralize power, particularly if you have formal authority

▶ Create norms of acceptable critiquing, and ask for critiques of your own ideas

Step 2:
Team Formation – 5-10 minutes

Four-person teams are formed for the simulation. The students will be informed that they are members of an executive team for a large computer manufacturer. Their objective is to lead a team in making an optimal decision relating to buying out a competitor in order to gain market share. Depending on how you embed the simulation in the course, you may also want to inform them that reaching the optimal decision will come through 1) correctly recognizing and utilizing team member expertise, and 2) correctly recognizing and dealing with team member motives. Alternatively, these concepts can be discussed after the simulation.

All team members have a one-page summary of the case including the decision to be made, industry characteristics, and other relevant information (Appendix A). In addition, each team member has a one-page summary of the role that they are to play in the team (Appendices B, C, D, and E). Each team member will play one of the following roles: Chief Executive Officer (CEO), the Director of Human Resources (DHR), Director of Operations (DO), or the Chief Financial Officer (CFO). Team members only receive information for their assigned roles, and not for the other team roles. While the CEO role implies an element of being the assigned leader, it should be made clear that the participants are members of a management team with each having the potential to make an important contribution. A summary of the expertise and motives for each role is provided in Table 1.

Step 3:
Individual Case Review – 5 minutes

The students should have several minutes to review the case and role information individually before beginning the team interactions. Having enough time to internalize the information as well as their motive orientation will improve the realism of the simulation.

Role	Expertise	Motives
TABLE 1. **SUMMARY OF EXPERTISE AND MOTIVES BY TEAM ROLE**		
CEO	Recognizes strategic position	Career advancement by the deal
DHR	Understands the impact on human capital, turnover, etc. Knows impact on staffing levels	Doesn't want to be controlled by Finance Resents that operations was given money for projects and not HR
CFO	Knows financing options Knows that BuyIt has the updated technology	HR is too costly, should be controlled by important functions
DO	Knows that equipment is outdated Knows that the new technology would likely reduce turnover	Does not trust Finance Operations is more central to business than the 'soft stuff' of HR

Step 4:
Team Case Discussion and Decision-making – 20 minutes

The students now discuss as an executive team the corporate buyout decision that they are to make. While they can share the unique information they possess, they are not allowed to directly read each other's personal information sheets. The teams will try to reach consensus on one of several options. During this discussion, the facilitator can observe the team interaction making note of group-process issues, and providing feedback if desired.

Step 5:
Class Debrief and Discussion – 15 minutes

The CEO of each team reports their team's decision to the entire class, along with a brief justification. They will also be asked to summarize the behavior in the team that facilitated or impeded the obtaining of information and management of mixed-motives within the team. The instructor should highlight the application of the recommendations from step one and the impact that it had on the team. While instructors can use the simulation to illustrate a variety of group-process principles, they may debrief the students using specific questions as:

- ▸ How aware were you of the information possessed by your team members?
- ▸ What steps were taken to find out what team members knew?
- ▸ Did the expertise and motives of the CEO have a disproportionate impact on the team's decision?
- ▸ How was dispersed information integrated to make the decision?
- ▸ Were there any difficulties or misunderstandings that arose in the team decision-making process?
- ▸ How did the motives of each team member influence your interactions?
- ▸ Was any information discounted because of these motives?
- ▸ How did the experiences of team members vary depending upon the role that they

had in the team? (this theme could be used on all the above questions)

Conclusion:

Students leading teams in their courses and in their careers will need to effectively deal with knowledge being distributed across team members and the motives held by those team members. This paper makes several key contributions to higher education. First, it reviews research on distributed knowledge and mixed-motives in teams and highlights their importance to working in a team. Second, the paper provides a structured simulation for illustrating the phenomenon in a realistic role play. Third, the paper provides facilitation guidelines for aiding the development of the leadership skills needed to deal with this knowledge dispersion. Finally, this simulation helps to prepare graduates for being leaders by making them more aware of the distributed-knowledge and mixed-motive problems as well as providing them some tools for dealing with them. It is hoped that this simulation is useful to educators attempting to prepare their students to be leaders in their teams and organizations.

**Appendix A
Executive Team
Decision-making Simulation**

The Setting

You are a member of the executive team for WePC, Inc. Your team is composed of the company's Chief Executive Officer (CEO), the Director of Human Resources (DHR), Director of Operations (DO), and the Chief Financial Officer (CFO).

Your team is meeting to discuss a critical decision that must be made, involving the possible buyout of a smaller competitor, BuyIt, Inc, that could give you a distinct competitive advantage in the industry.

The Industry

WePC, Inc. and ThemComp, Corp. are both in the personal computer manufacturing business. As of July of last year, WePC has 39 percent of the market, with ThemComp having 32 percent. The next closest competitor, in terms of market share, is BuyIt, Inc. who holds 15 percent. The remaining 14 percent is shared by several smaller companies.

The Decision

New management has recently taken over BuyIt, Inc. and your team has been surprised by an unexpected offer. BuyIt has expressed an interest in being bought out by either WePC or ThemComp, a deal that could dramatically change the industry landscape. Furthermore, management at BuyIt has indicated that the buyout will take place with the company that offers that most lucrative deal in the quickest time, placing considerable time pressure on your team to decide if the purchase of BuyIt, Inc is in your best interest. If the team is not able to reach consensus, then the CEO must make the ultimate decision.

Your goals, as the executive team of WePC, Inc, are to decide which of four options you will choose. These options include:

1. Do not make any offer to purchase BuyIt, Inc.
2. Offer to purchase BuyIt, Inc. for $300 million, from debt financing
3. Offer to purchase BuyIt, Inc. for $300 million, from cost cuts.
4. Offer to purchase BuyIt, Inc. for $300 million, from some combination of cost cuts and debt financing.

Appendix B
Chief Executive Officer (CEO):

You are very excited about the possibility of this buyout. You have been feeling pressure for quite some time from the board of directors to gain market share, and this seems like the perfect chance. The purchase would give WePC, Inc. such a large advantage in the industry; passing it up would likely be foolish.

Having a market share is a large competitive advantage in this industry because it provides leverage in forming relationships with component suppliers that can be leveraged to influence the adoption of industry standards in terms of product specifications and compatibility. In addition, larger manufacturers can negotiate more exclusive contracts with computer retailers and large customers such as government or fortune 500 companies.

By purchasing BuyIt, you would gain a lot of notoriety for being CEO for the leading organization in your industry. You would like the team's input before a final decision is made, so you have called this meeting. The questions are "how does the rest of the executive team feel about the buyout?", "how much should be offered?", and "where would the funds come from for making such a purchase?" You hope to get some facts from them in terms of how the purchase should be funded, how much should be bid, and what decision they would support.

Appendix C
Director of Human Resources (DHR):

If you are to raise the $300 million to purchase BuyIt, Inc., about 20% of the money will have to come from cost cuts that directly affect the HR department. The cuts would result in having to cancel the leadership development training, trimming employee benefits, and freezing all salary levels for the next three years. This could prove detrimental to morale, turnover, absenteeism, and your overall performance as DHR. You have already seen turnover increase over the last five years and exit interviews indicate that your most qualified employees are leaving for ThemComp, Inc due to their higher compensation levels.

In addition, due to overlapping functions between WePC and BuyIt, several personnel cuts will be necessary. It is estimated that 23 % of the sales force, 25% of the manufacturing employees, and 20 % of managerial and administrative staff will have to be cut to generate cost savings sufficient to raise the funds. You have already seen funds promised you for a new HRIS system tak-

en away and given to Operations. You don't want to be stepped on again.

You wonder why the purchase has to be funded through extreme cost cutting. Surely, the finance department can get the resources from the capital markets... after all isn't that what the Finance department is paid to do?

Appendix D
Chief Financial Officer (CFO):

You have run the numbers on the buyout of BuyIt, Inc several times. You realize that there are two basic ways to finance the buyout: cost cutting and/or debt financing. You see cost cutting as the best option, because you have watched both operating and HR administrative costs skyrocket for the six years you have been with the company. It is clearly a time for trimming back, and the possible buyout will give you the chance to make the case to the CEO. You believe that by reducing the number of HR programs, and laying off a significant portion of the staff made redundant by the buyout, substantial cost savings could be achieved. HR is such a cost center; they should have no choice but to go along with it.

You are sure that the operations and manufacturing department could also cut costs in several areas. You expect the director of operations to let you know where those costs can be cut. Besides, BuyIt has just upgraded its manufacturing technology and is carrying excess capacity.

Another alternative for raising the money is through debt financing. It is possible that the company could use its good credit with international banks to obtain the funds. You would not be able to get $300 million in credit extended, however, because your company is already heavily leveraged. Perhaps a lesser amount, such as $100 million, could be procured. That is, you are already carrying a lot of debt, and the bank is likely to see lending more money to WePC as a large risk. Besides, you feel that there is no need to risk bankruptcy when the funds can be raised by cost cuts in other departments.

Appendix E
Director of Operations (DO):

For years you have been trying to get a proposal through the tight-fisted finance department for new manufacturing equipment. In this industry, technology changes so quickly that if you don't continually update your machinery and procedures, you will soon lag behind. Despite the fact that you are using machinery that is becoming outdated, the finance department has been uncooperative, and slow to approve the necessary expenditures to replace it. You believe this lack of support from the finance department is due to the CFO who came to WePC from the tool manufacturing industry where technology changes more slowly, and equipment rarely needs to be updated. You don't think the CFO understands how crucial it is that you receive these funds to update the machinery to enable higher quality production and more interesting work for employees that would certainly help with retention.

Just last month however, $50 million was approved for your department to replace some of the existing technology. You had to fight HR for it, but finance finally saw your side. The money was also earmarked to invest in expanding your research and development of innovative new products and manufacturing methods. You have little doubt that if the buyout occurs, the finance department will renege on its promise and redirect those funds.

References

Austin, J. R. (2003). Transactive memory in organizational groups: The effects of content, consensus, specialization, and accuracy on group performance. *Journal of Applied Psychology*, 88, 866-878.

Bunderson, J. S. (2003). Recognizing and utilizing expertise in work groups: A status characteristics perspective. *Administrative Science Quarterly, 48*, 557-591.

Cohen, S. G., & Bailey, D. E. 1997. What makes teams work: Group effectiveness research from the shop floor to the executive suite. *Journal of Management, 23*, 239-290.

Denison, D. R., Hart, S. L., & Kahn, J. A. (1996). From Chimneys to Cross-Functional Teams: Developing and Validating a Diagnostic Model, *Academy of Management Journal, 39*, 1005-1023.

Henry, R. A. 1995. Improving group judgment accuracy: Information sharing and determining the best member. *Organizational Behavior & Human Decision Processes, 62*,190-197.

Libby, R., Trotman, K. T., & Zimmer, I. (1987). Member variation, recognition of expertise, and group performance. *Journal of Applied Psychology, 72*, 81-87.

Littlepage, G., Robison, W., & Reddington, K. (1997). Effects of task experience and group experience eon group performance, member ability, and recognition of expertise. *Organizational Behavior and Human Decision Processes, 69*, 133-147.

McGrath, J. E. (1991). Time, interaction, and performance (TIP) A theory of groups. *Small Group Research, 22*, 147-174.

Mohammed, S. & Dumville, B. C. (2001). Team mental models in a team knowledge framework: Expanding theory and measurement across disciplinary boundaries. *Journal of Organizational Behavior, 22*, 89-106.

Moreland, R. L. (1999). Transactive memory: Learning who knows what in work groups and organizations. In L. L. Thompson, J. M. Levine, and D. M. Messick (eds.), *Shared Cognition in Organizations: The Management of Knowledge*. (pp. 3 – 31). Mahwah, NJ: Lawrence Erlbaum.

Mumford, T. V., Campion, M. A., & Morgeson, F. P. (2006). Situational judgment in work teams: A team role typology. In J. A. Weekley & R. E. Ployhart (Eds.), *Situational judgment tests: Theory, measurement, and application* (pp. 319-343). Mahwah, NJ: Lawrence Erlbaum Associates.

Stasser, G. (1999). The uncertain role of unshared information in collective choice. In L. L. Thompson, J. M. Levine, and D. M. Messick (eds.), *Shared Cognition in Organizations: The Management of Knowledge*. (pp. 49 – 69). Mahwah, NJ: Lawrence Erlbaum.

Tenkasi, R. V. & Boland, R. J. (1996). Exploring knowledge diversity in knowledge intensive firms: A new role for information systems. *Journal of Organizational Change Management, 9*, 79-91.

Wegner, D. M. 1987. Transactive memory: A contemporary analysis of the group mind. In B. Mullen & G. R. Goethals (Eds.), *Theories of Group Behavior* (pp. 185-205). New York: Springer-Verlag.

Wittenbaum, G M. (2000). The bias toward discussing shared information: Why are high-status group members immune? *Communications Research, 27*, 379-401.

Process Facilitation in Geographically Dispersed Virtual Groups

William L. Tullar[1]

Department of Business Administration
Bryan School of Business and Economics
University of North Carolina at Greensboro
Greensboro, NC 27412-5691

ABSTRACT

This study examines the effects of process facilitation and prior group type on process and outcomes in geographically dispersed virtual groups. It is important for effective distance education to have effective student groups. Student participants working in asynchronous virtual groups made a personnel decision among three competing candidates for a job in a fictional university. Half the groups participating in the experiment began their work in a face-to-face setting, the other half in a Nominal Group setting. Half of the groups received process facilitation and the other half did not. Results showed that group formation had a significant effect on group process, but facilitation did not. On the other hand, facilitation had a significant impact on decision outcomes, both in terms of changing peoples' ratings via group discussion and in terms of accuracy of final ratings. Implications of the results for groups in distance education are discussed.

Introduction

Foster (2007) reports in a recent issue of the *Chronicle of Higher Education* that the University of Illinois is planning to increase its overall enrollment to 70,000 by 2018. Their object is to satisfy the growing demand of adults who want to learn on their own schedules. The only way this growth can be accomplished is via distance education. Much of this distance education will involve work with student groups. Indeed, part of the motivation for adult learners using such a service is their inclusion in learning groups. It would seem that virtual student learning groups are here to stay.

A number of studies (e.g. O'Lawrence, 2006) demonstrate some of the motivational advantages of using virtual groups with adult learners in distance education. For instance, Beuchot & Bullen (2005) examined graduate student groups interacting in small group forums. They found that some regulation of interactions and attempting to build more cohesive groups encouraged more controlled patterns of interactive online behavior and improved the group process. The present study examines two factors of on-line groups that instructors of such groups can use to make the virtual group experience in distance education more positive, namely group formation and facilitation.

Facilitation

A review of the literature did not turn up any studies of process facilitation of virtual groups in the distance education literature. However, there have been a number of studies that examined the effect of process facilitation as group outcomes in GSS groups (e.g. Dickson, Partridge, & Robinson, 1993; Partridge, 1992; Wheeler & Valacich, 1996; Shaila & Bostrum, 1999). Bostrum, An-

son, and Clawson, 1993 defined facilitation as "activities carried out before, during, and after a meeting to help the group achieve its outcomes." Most recently, Shaila & Bostrum (1999) examined the effects of content and process facilitation on group processes and outcomes. Using a GSS methodology, they showed that process facilitation aided group process whereas content facilitation actually produced negative effects. This study examines process facilitation in geographically dispersed virtual groups in an attempt to extend and clarify the Shaila and Bostrum (1999) findings.

Stubbs, Martin, & Endlar (2006) argue that structuration theory can provide a metaframe work for assisting educational designers in creating coherent blended learning experiences that reinforce intended learning outcomes. They assert that educational designers must be sensitive to both their audience and to the unintended and unanticipated consequences of their designs. I argue that structuration theory is the framework that points us toward unanticipated consequences of the virtual group experience.

Process Structuration Theory

Structuration Theory is a theory of social interaction that has gained a substantial number of adherents in the past twenty years (Giddens, 1979, 1984; Poole, Seibold, & McPhee, 1985; Barley & Tolbert, 1997; Shaila & Bostrum, 1999). Structuration refers to the process of production and reproduction of social systems via the application of generative rules and resources (Giddens, 1979). Structurationists generally distinguish between the concept of system and the concept of structure. For example, the status hierarchy of a group may be thought of as a social system. The structure behind this system is a set of rules and resources. There are norms for superiors/subordinate interaction. Superiors have control over budgets, other resources, and promotions, while subordinates' have control over communication access from lower level subordinates' to the highest levels of the organization. Structures according to this theory are both the medium for action and the outcome of action. They are the medium because structures contain the rules and resources people must draw on to interact mean-

ingfully. They are the outcome because rules and resources only exist through being applied and acknowledged in interaction - - they have no existence apart from the social practices they constitute (Poole, Seibold, & McPhee, 1985).

Whenever structure is employed in action, the activity reproduces the structure by displaying it and confirming it as a meaningful basis for action. New group members watch the established group members and thus learn how to participate. The behavior of the old members reproduces the group's structure. The behavior of new members reproduces the old structure but often with subtle, evolutionary twists. Structures are properties of interaction systems. They extend over time since social practices do not occur in a split second. They are not just cognitive maps in people's heads because they are intersubjective and only realized as interaction unfolds (Giddens, 1984). In the unfolding process, cognitive maps are altered.

Structuration also explains why many meetings and group activities are full of conflict and inaction. The explanation for poor interaction and low productivity is that group structures can either mutually assist or mutually oppose each others' production and reproduction. Such assistance or opposition can result in mediated or contradicted interpenetration (Giddens 1979; 1984). In mediated interpenetration two structures act in a complementary manner and continue to exist and reinforce one another. In the case of contradicted interpenetration, one structure is weakened or ceases to exist and the other is strengthened. For instance, suppose that the two structures were the status structure of the group and the communication patterns. In mediated interpenetration the status structure and the communication patterns could reinforce one another: Equals would discuss things with equals and share their results with inferiors after their discussion. The communication pattern would reinforce the status hierarchy. However, suppose that communication becomes anonymous. Since no one can tell who initiated a message, the communication pattern goes from hierarchical to all channel - - thus, one of the structures, the communication pattern, contradicted the other, the status hierarchy. This would then be an example

of contradicted interpenetration (Tullar & Kaiser, 2000).

Experimental Manipulations in Structuration Theory

Therefore this theoretical approach to groups leads to manipulations that could produce mediated interpenetration and a maximally effective unfolding group process. In order to affect the process structuration, interventions which occur prior to group formation and interventions during the group process are both possible. Bostrum, Anson, & Clawson (1993) identify three major structuration intervention strategies: Supporting task content, supporting the group process, and group training.

Shaila and Bostrum (1999) provided solid evidence for the proposition that content facilitation actually had a negative impact on meeting processes. However, they did find that process facilitation had a positive impact on the processes. Facilitation of meeting processes exerted a significant positive impact on satisfaction but produced no significant effect on decision quality.

Tullar and Kaiser (2000) explored the effects of training on group processes and outcomes. They concluded that groups trained in maintenance behaviors had more supportive and more participative processes and that they produced superior outcomes. Even a relatively brief training experience was able to improve both the process and the outcomes in their experiment.

Process and Content Facilitation

A number of different studies have examined the effect of process facilitation as group outcomes in GSS groups (e.g. Dickson, Partridge, & Robinson, 1993; Partridge, 1992; Wheeler & Valacich, 1996; Shaila & Bostrum, 1999). Since process facilitation is integral to the GSS approach to group decision making, a theory of group facilitation is important to an understanding of how GSS functions. Bostrum, Anson, and Clawson, 1993 defined facilitation as "activities carried out before, during, and after a meeting to help the group achieve its outcomes." Shaila &

Bostrum (1999) examined the effects of content and process facilitation on group processes and outcomes. They concluded that content facilitation actually had a negative impact on meeting processes. On the other hand, they found that process facilitation had a positive impact on the processes. Meeting processes had a strong positive impact on satisfaction but no significant effect on quality.

The literature in GSS facilitation typically focused on three types of outcomes from intervention: Improvements in the process, group satisfaction with the process and outcome, and the quality of the outcome. This study makes use of all three of these dependent variables since they are so commonly used in the GSS literature (Benbasat & Lim, 1993).

This study is an attempt to extend the findings of Shaila & Bostrum (1999) into virtual groups in an on-line course. Tullar and Kaiser (2000) showed that video training improves both process and outcomes in such groups. The present study examines the effects of facilitation and prior group history on process and outcomes of decision making groups working on a human resource decision.

Given the anomie felt by members of groups that never actually see each other, it seemed likely that some prior work with members of the same group might well improve both group process and outcomes. That is, groups that have had the opportunity to work together face-to-face prior to their work in a geographically, temporally dispersed setting should have an advantage over groups that have not had this face-to-face experience. The usual antithesis of face-to-face groups is NGT groups - - groups that work in the same place at the same time, but don't interact with each other. Since all communication in the geographically dispersed groups is done via discussion boxes, it seemed logical that groups that had had the opportunity to work in a face-to-face setting would have a distinct advantage over groups that had only worked in an NGT setting when they got to interaction via the discussion boxes. Therefore, the first hypothesis was that groups that had face-to-face experience would do better

on both process and outcome measures of group performance.

Shaila & Bostrum (1999) were able to establish that in GSS groups, process facilitation enhanced group process but not group outcomes. They also found that content facilitation did not help either process or outcomes but rather had negative effects. Therefore, hypothesis two was that facilitated groups should produce superior processes. Hypothesis three was that there should be no significant difference in outcomes when comparing facilitated vs. non-facilitated groups.

Since this study was conceived of as a factorial experiment, there is the possibility of interaction between facilitation and group type (NGT vs. face-to-face). While there does not seem to be any small group literature that tests this proposition directly, it seems logical that if facilitated groups have an advantage over non-facilitated groups and if face-to-face groups have an advantage over NGT groups that if there were a disordinal interaction between the two factors it would be that facilitation would aid NGT group process considerably more than it would face-to-face interaction. Thus, hypothesis four was that facilitation should have a stronger effect on group processes in NGT groups than in face-to-face groups.

Method

Participants

Participants were 85 volunteer college sophomores and juniors from a southeastern university. All participants were enrolled in an introductory business communications course offered in part by distance. Their participation was part of their course requirements; they received no additional compensation. Most of them had previously participated in team projects in other classes or on the job. None of them had previously participated with the currently assigned teams. The experiment was originally designed for groups of six. However, there were several groups of five due to enrollment and dropout problems.

Website

A project website was designed and constructed on a server that was used solely for this project. There were also two back-up servers available for times of high traffic so that it was always possible to log on and participate. The website contained 66 pages including all the instructions, all questionnaire questions, and evaluation forms. The website was made as easy to understand as possible. Once the participants received initial instruction, there were no problems with using the website during the experiment.

Each student was given a password and user name to enter the site. Figure 1 shows the sequence of activities in the experiment. Each subject had to complete each step before s/he could proceed to the next step. Thus, participants could not advance to the discussion until they had completed all their individual work first.

Procedure

The experiment was conducted in such a way that participants could log on and participate in the experiment when they chose to from any computer with Internet access. Each subject was randomly assigned to a group. Each group consisted of six members except where enrollment or dropouts reduced the group to five.

Participants were given materials on a fictitious position at a fictitious university, Pine Ridge State. Via the web page, they were given the candidates' résumés, a position description, and a description of the university. In addition, they were given digitized videos of the three candidates' interviews.

Each subject completed all the individual tasks of reviewing the résumés, the position description, the description of the university, and then viewing the digitized interviews in exactly that order since the website did not allow participants to go on to the next task until they had finished the previous one. After all the individual tasks were completed, participants were allowed to meet with their groups online in the threaded discussion format. An example of the threaded discus-

FIGURE 1
COMPUTER SCREEN
TRACKING SUBJECT PARTICIPATION

The Virtual Team Communication Challenge
UNCG

Teamwork Project Individual Status

Welcome Sonja,

Our records indicate that you have completed so far 1 of 22 activities. You should now work on activity 2.
The activities below are required in the project. We hope that you enjoy the project.

Status	No	Activity	Due Date
✓	1	STEP 1 – Registration & Training	
➡	2	Helpful Hints	
	3	Register your participation	(3/24/00)
	4	Learn about high performing teams	
	5	Introductory threaded discussions	
	6	STEP 2 – Reviewing background information	
	7	Information about Pine Ridge State University	
	8	Information about the Open Position	
	9	STEP 3 – Reviewing candidate resumes	
	10	Reviewing On-line Resumes	
	11	Evaluating the Resumes	(3/27/00)
	12	STEP 4 – Reviewing candidate interviews (digitized videos)	
	13	Reviewing Digitized Videos of Interviews	
	14	Evaluating the Interviews	(3/29/00)
	15	STEP 5 – Group discussions and consensus building	
	16	Threaded Discussion for Introductions and Planning Purposes	(3/29/00)
	17	Threaded Discussion for Evaluating Candidates	(4/3/00)
	18	Submitting a Group Consensus Recommendation	(4/14/00)
	19	STEP 6 – Developing the Memo	
	20	Format Instructions for the Report You Must Produce	(4/19/00)
	21	STEP 7 – Post-Simulation Opinions and Impressions	
	22	Debrief and analysis	(4/17/00)

Record COMPLETED Steps and Exit

sion used is shown in Figure 2. The participants discussed (threads) are listed down the left hand side of the page, and comments on the participants (branches) are listed indented from the left hand margin. At the conclusion of the discussion, participants rated the three candidates again and then tried to come to a group consensus in order to write a memo of recommendation for one candidate. All the stimulus materials were displayed, all discussions were carried on, and all ratings were performed via the web page.

Independent Variables

There were two types of groups formed among the participants prior to the beginning of the computer work. Half of the participants were randomly assigned to groups that met to work on an idea generating task where they could work face-to-face and the other half were randomly assigned to groups that worked as nominal groups, producing ideas while working in the same room, but not interacting.

After the group discussion phase of the experiment began, half of the groups were assigned (randomly) a facilitator. There were two facilitators in all. The facilitators were trained to make suggestions to the group on process issues only. Their focus was principally on keeping the group focused on the task and making sure that at least minimal maintenance behavior occurred.

This experiment thus was a two by two design: two levels of facilitation were completely crossed with two levels of group type.

FIGURE 2
COMPUTER SCREEN FOR
THREADED DISCUSSIONS
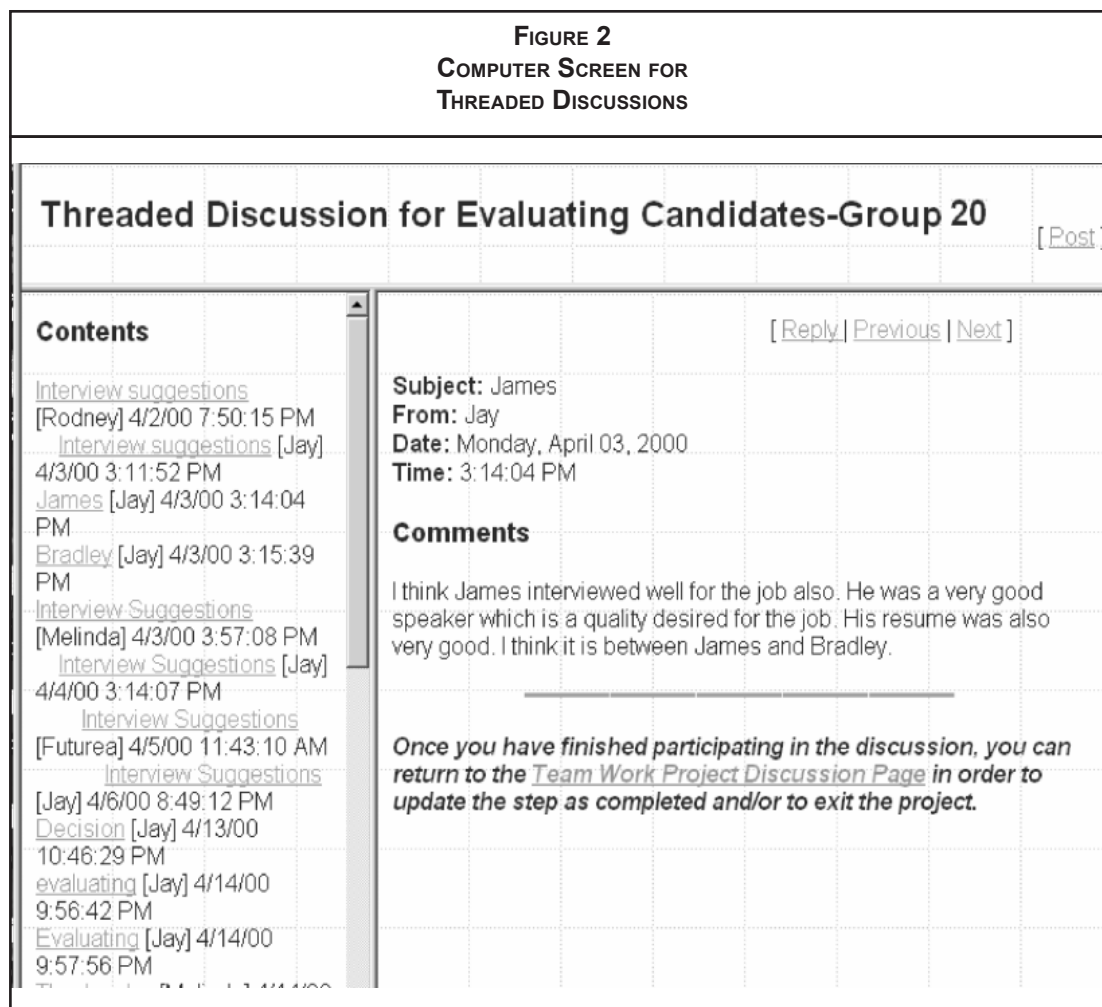
Measures: Four distinctly different types of measures were used in this study. The first type was self-report measures of group processes: competition, support, and participation. These were scales that had been produced as part of an earlier study (Tullar & Kaiser, 2000). The items from each of the three scales are found in Appendix 1. The second type of measure was ratings of task and maintenance behaviors of each group member. These ratings were made by two independent raters. The inter-rater reliability on them was .88 for task and .85 for maintenance. The raters discussed any differences they had to consensus and the consensus was the number used. The third type of measure used was the change in participant ratings of the three candidates for the job from their ratings after the interview to their ratings after the group discussion. The last type of measure used was the accuracy of the ratings. Using 15 local Human Resource managers, the author had each of the three candidates rated as to his suitability for the job. The ratings were then averaged and the average was considered to be the ideal rating for each candidate. Scores were calculated by taking the absolute value of the difference between the ideal rating and the participant's actual rating. I argue that this is a measure of the accuracy of the final judgment after group discussion.

Results

Table 1 shows the means and standard deviations for the four cells of the experimental design. As may be seen in this table, there is a big difference in the number of items in the competition scale when compared to the support and participation scales (see Appendix 1 for all the items). The results for competition are not clearly different for either factor. The results for support and participation do suggest differences between NGT and face-to-face groups.

Table 2 shows that hypothesis one is supported by the ANOVA results. Although there is no difference in competition between the two types of groups there are significant differences in favor of the face-to-face groups for both support and participation. Although participation scores are, on average, lower in the interacting groups, this is because the scale (see Appendix 1) is such that lower scores mean greater and more enthusiastic participation. Similarly, support is greater in interacting groups. So hypothesis one receives at least partial support from the self-report process variables.

But Table 2 also shows that there is no effect at all for facilitation. Contrary to hypothesis 2 there is no effect for facilitation on group process. One would expect both greater participation and support in facilitated groups, but it simply doesn't obtain. Even competition, which comes closest to being significant, is far away from a significant difference.

Table 3 shows that there are substantial differences between the NGT and face-to-face groups. While the facilitated and non-facilitated groups appear to be very similar in the ratings, the differences between NGT and face-to-face groups are apparent, even without calculating the ANOVA.

		NGT Groups		Interacting Groups	
	Dependent Variable	Mean	SD	Mean	SD
	Competition	66.67	8.60	67.26	7.45
Facilitated Groups	Support	25.52	8.60	28.00	6.94
	Participation	24.33	6.58	22.74	6.19
	Competition	62.23	10.41	66.09	6.54
Non-facilitated Groups	Support	26.09	4.97	29.14	5.80
	Participation	27.09	4.96	23.04	5.50

TABLE 1
MEANS AND STANDARD DEVIATIONS FOR
PROCESS SELF-REPORT MEASURES

TABLE 2
ANOVAs FOR FACILITATION AND GROUP TYPEEFFECTS ON
SELF-REPORT PROCESS MEASURES

Source of Variance	Sum of Squares	df	Mean Square	F
Facilitation				
Competition	166.690	1	166.690	2.370
Support	1.486	1	1.486	0.033
Participation	45.558	1	45.558	1.348
Group Type				
Competition	104.964	1	104.964	1.492
Support	238.136	1	238.136	5.349*
Participation	369.081	1	369.081	10.922**
Facilitation x Group Type				
Competition	56.286	1	56.286	0.800
Support	.961	1	0.961	0.022
Participation	66.580	1	66.580	1.970
Error				
Competition	5698.041	81	70.346	
Support	3606.129	81	44.520	
Participation	2737.126	81	33.792	

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

TABLE 3
MEANS AND STANDARD DEVIATIONS FOR
TASK AND MAINTENANCE RATINGS OF GROUP MEMBERS

		NGT Groups		Interacting Groups	
	Dependent Variable	Mean	SD	Mean	SD
Facilitated Groups	Task Rating	20.05	7.39	25.95	3.80
	Maintenance Rating	21.57	8.18	27.95	5.77
Non-facilitated Groups	Task Rating	20.87	7.97	23.22	6.76
	Maintenance Rating	21.78	10.84	26.00	6.73

Table 4 shows the ANOVA for both task ratings and maintenance ratings. As indicated above in the descriptive statistics: Interacting, face-to-face groups have a clear advantage over NGT groups in both task and maintenance ratings. This may be seen as additional evidence supporting hypothesis one. However, hypothesis two once again receives no confirmation. There are no statistically significant differences between facilitated and non-facilitated groups on either ratings of task performance or maintenance performance over the course of the group discussion.

Table 5 shows the descriptive statistics for the movement of ratings from post interview to post discussion ratings. The minus signs indicate a movement down from post interview to post discussion ratings and the positive numbers indicate the opposite. Here the means appear quite different for the facilitated as opposed to the non-facilitated groups although the standard deviations are very large.

Table 6 indicates that, contrary to hypothesis three, facilitation proves to be a potent variable. There are significant differences in movement for

TABLE 4 ANOVAs for Facilitation and Group TypeEffects on Ratings of Performance in the Group				
Source of Variance	Sum of Squares	df	Mean Square	F
Facilitation				
Task Rating	16.381	1	16.381	0.245
Maintenance Rating	19.779	1	19.779	0.435
Group Type				
Task Rating	608.284	1	608.284	9.090**
Maintenance Rating	368.770	1	368.770	8.118**
Facilitation x Group Type				
Task Rating	25.305	1	25.305	0.378
Maintenance Rating	68.454	1	68.454	1.507
Error				
Task Rating	5554.006	83	5554.006	
Maintenance Rating	3770.424	83	3770.424	

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

TABLE 5 Means and Standard Deviations for Measures of Movement from Pre-discussion to Post-discussion Ratings					
	Dependent Variable	NGT Groups		Interacting Groups	
		Mean	SD	Mean	SD
Facilitated Groups	Movement for Landreth	7.81	10.24	6.79	6.95
	Movement for Haldane	2.76	12.20	5.74	14.87
	Movement for Redfield	-2.19	12.75	2.74	6.76
Non-facilitated Groups	Movement for Landreth	-0.59	14.30	1.17	14.79
	Movement for Haldane	-11.64	25.41	-5.22	14.88
	Movement for Redfield	4.64	12.50	1.78	10.69

Landreth (the candidate the HR experts rated best) and Haldane (the candidate the HR experts rated worst), but no significant movement for Redfield, the middle rated candidate. Group discussion in facilitated groups caused significantly more movement up for Landreth, the best candidate and down for Haldane, the worst candidate.

Redfield, the middle-rated candidate, produces the only interaction found in all these ANOVAs. This interaction is depicted in figure 3. As may be seen clearly in this figure, facilitated groups have a low mean (negative) for NGT groups and a high mean for face-to-face groups. Non-facilitated groups have a high mean for NGT groups that drops substantially for face-to-face groups.

Figure 3
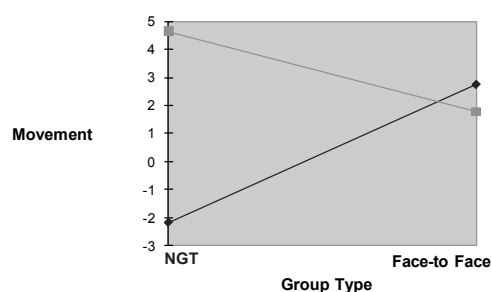Interaction for Redfield Movement between Group Type and Facilitation

Source of Variance	Sum of Squares	df	Mean Square	F
TABLE 6				
ANOVAs for Facilitation and Group Type Effects of Measures of				
Movement from Pre-discussion to Post-discussion Ratings				
Facilitation				
Movement for Landreth	1038.400	1	1038.400	6.967**
Movement for Haldane	3397.493	1	3397.493	10.840**
Movement for Redfield	182.297	1	182.297	1.495
Group Type				
Movement for Landreth	2.932	1	2.932	0.020
Movement for Haldane	466.455	1	466.455	1.488
Movement for Redfield	22.727	1	22.727	0.186
Facilitation x Group Type				
Movement for Landreth	40.995	1	40.995	0.275
Movement for Haldane	62.698	1	62.698	0.200
Movement for Redfield	505.885	1	505.885	4.151*
Error				
Movement for Landreth	12073.019	81	149.050	
Movement for Haldane	25386.498	81	313.414	
Movement for Redfield	9873.926	81	121.900	

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

TABLE 7
Means and Standard Deviations for
Measures of Accuracy of Post-discussion Ratings

	Dependent Variable	NGT Groups		Interacting Groups	
		Mean	SD	Mean	SD
Facilitated Groups	Accuracy for Landreth	5.57	6.23	4.05	3.46
	Accuracy for Haldane	14.29	10.13	9.37	7.97
	Accuracy or Redfield	13.95	9.74	4.63	4.10
Non-facilitated Groups	Accuracy for Landreth	7.05	9.05	8.74	10.65
	Accuracy for Haldane	21.32	24.52	20.26	11.27
	Accuracy for Redfield	5.46	6.48	10.52	7.83

Tables 7 and 8 show a very similar pattern of results as Tables 5 and 6 do. Here again, the ratings of Landreth and Haldane are the most accurate in the facilitated condition. The interaction between facilitation and group type shows up again in the middle-rated candidate Redfield. In this case, non-facilitated groups are the most accurate NGT condition groups whereas facilitated groups are the most accurate interacting groups. This would seem to mean that in those groups that had poorer process, facilitation actually made their judgment worse whereas in those groups that had better process (i.e. face-to-face groups), facilitation made their judgment better. This result along with that found in Table 6 tends to confirm hypothesis four, namely that facilitation has a more profound effect for NGT groups than for face-to-face groups.

Discussion:

This study seems to be at odds with the Shaila & Bostrum (1999) results. They showed that process facilitation had process but not outcome

effects. These results seem to indicate that facilitation has outcome but not process effects. The best way to account for the difference in these results is to examine the difference in the two communication media. Shaila & Bostrum conducted their experiment in a GSS laboratory where the participants could see each other. Their participants could also see the facilitator. The experiment took place in real time.

These results on the other hand were obtained by having students participate in a pre-experiment exercise where they were either in nominal or face-to-face groups. Then they communicated via discussion boxes in different computer labs (or from home) at different times over a period of three weeks. Given these differences, it isn't really surprising that the differences between the two experiments are so great.

This study suggests that facilitation is useful, possibly even essential in groups that meet solely on the Internet in a virtual group. Facilitation seems to make group work a more potent vehicle to change opinions at the edges of the decision problem. Generally, more change was brought about on the best and worst candidates under conditions of facilitation.

The results also suggest that there is a real advantage to having groups meet face-to-face before they begin their work. Groups that establish face-to-face relationships apparently have some process advantages over groups that never know each other that way. The results seem to indicate that both for support and participation, establishing a face-to-face rapport first produces a better group process.

This last result may argue for the mixed model of distance education. That is, distance education where participants meet at least once to get to know one another and their instructor before beginning their work. While this is not possible in many distance education situations, these results at least suggest that there is some considerable benefit to meeting face-to-face.

Table 8
ANOVAs for Facilitation and Group Type Effects of Measures of Accuracy in Post-discussion Rating

Source of Variance	Sum of Squares	df	Mean Square	F
Facilitation				
Accuracy for Landreth	300.610	1	300.610	4.668*
Accuracy for Haldane	1698.365	1	1698.365	7.391**
Accuracy for Redfield	35.944	1	35.944	0.657
Group Type				
Accuracy for Landreth	.162	1	.162	0.003
Accuracy for Haldane	188.684	1	188.684	0.821
Accuracy for Redfield	95.638	1	95.638	1.748
Facilitation x Group Type				
Accuracy for Landreth	54.550	1	54.550	0.849
Accuracy for Haldane	78.757	1	78.757	0.343
Accuracy for Redfield	1094.252	1	1094.252	19.996**
Error				
Accuracy for Landreth	5203.480	81	64.240	
Accuracy for Haldane	18611.914	81	229.777	
Accuracy for Redfield	4432.567	81	54.723	

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

References

Barley & Tolbert, 1997. Institutionalization and structuration: Studying the links between action and institution. Organization Studies, 18, 1, 93-117.

Benbasat , I. & Lim, L. 1993. The effects of group, task, context, and technology variables on the usefulness of group support systems: a meta-analysis of experimental studies. Small Group Research, 24, 4, 430-462.

Beuchot, A. & Bullen, M. 2005. Interaction and Interpersonality in Online Discussion Forums. *Distance Education*, 26, 1, 67-87.

Bostrum, R. P., Anson, R., & Clawson, V. K. 1993. Group facilitation and group support systems. In L. Jessup and J. Valacich (eds.) Group Support Systems: New Perspectives. New York: MacMillan

Clark, T. 1998. Teaching students to enhance the ecology of small group meetings. Business Communication Quarterly, 61, 4, 40-52.

Dickson, G. W., Partridge, J. L., & Robinson, L. H. 1993. Exploring models of facilitative support for GDSS technology. MIS Quarterly, 17, 2, 173-194.

Duarte, D. L. & Snyder, N. T. 1999. Mastering Virtual Teams . San Francisco: Jossey-Bass Inc.

Foster, A. 2007. Illinois Plans to Draw 70,000 Students to Distance **Education** by 2018. *Chronicle* of *Higher Education*, 53, 34, 50.

Giddens, A. 1979. Central Problems in Social Theory. Berkeley: University of California Press.

Giddens, A. 1984. The Constitution of Society: Outline of a Theory of Structuration. Berkeley: University of California Press.

O'Lawrence, H. 2006. The Influences of Distance Learning on Adult Learners. Techniques: Connecting Education & Careers, 81, 5, 47-49,

Partridge, J. L.1992. An empirical investigation of task and interactional facilitator intervention in the use of group decision support systems. Ph.D. Dissertation, University of Minnesota.

Poole, M. S., Seibold, D. R., & McPhee, R. D. 1985. Group decision-making as a structurational process. Quarterly Journal of Speech, 71, 1, 74-102.

Shaila, M. & Bostrum, R. P.1999. Meeting facilitation: Process versus content interventions. Journal of Management Information Systems, 15, 4, 89-114

Stubbs, M., Martin, I. & Endlar, L. 2006. The Structuration of Blended Learning: Putting Holistic Design Principles into Practice. *British Journal of Educational Technology, 37*, 2, 163-175.

Tullar, W. L. & Kaiser, P. R. 2000. The effect of process training on process and outcomes in virtual groups. *Journal of Business Communication,* 37 , 4, 408-427.

Wheeler, B. & Valacich, J. 1996. Facilitation, GSS, and training as sources of process restrictiveness and guidance for structured group decision making: an empirical assessment. Information Systems Research, 7, 4, 429-450.

Appendix 1
Items for Process Measures

Competition Scale:

1. Was too much time and attention devoted to issues discussed early on?
2. Were certain points made too assertively?
3. Did some members seem more interested in winning the point than in solving the problem?
4. Were ideas opposed too quickly (rather than added to a list of alternatives to be considered)?
5. Were you interrupted by others trying to "sell" their ideas?
6. Did the group get "hung up" on details?
7. Was there a tendency to force the issue?
8. Were differences smoothed over rather than resolved?
9. Were group members competing with each other rather than cooperating?
10. Did the group seem to lose sight of the big picture?
11. Were people's ideas "put down" and negated?
12. Was there an attitude of overconfidence?
13. Did the discussion seem to turn into a contest?
14. Was the discussion more serious or intense than necessary?
15. Were members good at giving criticism (but not necessarily good at taking it)?
16. Did the influence of particular members outweigh their relative knowledge and expertise?
17. Did it appear that being accepted by the group was an issue for certain members?
18. Did members give the impression that their own ideas were undoubtedly the best?
19. Was there a tendency to be unrealistically or unnecessarily precise?

Support Scale:

1. Was there a friendly exchange of preliminary thoughts and "rough" ideas?
2. Was the group helpful in crystallizing your ideas?
3. Was the discussion relaxed and open?
4. Did the group accept and build on ideas offered by individual members?
5. Were people really listening to each other?
6. Did you get thoughtful feedback on your ideas and suggestions?
7. Did members actively look to each other for ideas, insights, and opinions?
8. Did the group stay focused on the objective?
9. Was direction and leadership provided without people "taking over"?
10. Was genuine concern shown for people's doubts, reservations?
11. Was cooperation and teamwork maximized?
12. Did members really "get into" the problem and enjoy it?

Participation Scale:

1. Did some members seem to expect others to run the meeting?
2. Was there a need for greater involvement on the part of certain members?
3. Was there a need for greater diversity in viewpoints and opinions expressed by members?
4. Did certain members decline to take on their share of group leadership responsibilities?
5. Did the group seem constrained, limited to certain perspectives?
6. Was more initiative and leadership needed?
7. Did people stay detached (and never fully come together as a team)?

JOINT CONFERENCE
May 31st, June 1st, and June 2nd 2010 in
Nashville, TN at the legendary Opryland Hotel

Academic Business World International Conference (ABWIC.org)

The aim of Academic Business World is to promote inclusiveness in research by offering a forum for the discussion of research in early stages as well as research that may differ from 'traditional' paradigms. We wish our conferences to have a reputation for providing a peer-reviewed venue that is open to the full range of researchers in business as well as reference disciplines within the social sciences.

Business Disciplines

We encourage the submission of manuscripts, presentation outlines, and abstracts pertaining to any business or related discipline topic. We believe that all disciplines are interrelated and that looking at our disciplines and how they relate to each other is preferable to focusing only on our individual 'silos of knowledge'. The ideal presentation would cross discipline. borders so as to be more relevant than a topic only of interest to a small subset of a single discipline. Of course, single domain topics are needed as well.

Conferences

Academic Business World (ABW) sponsors an annual international conference for the exchange of research ideas and practices within the traditional business disciplines. The aim of each Academic Business World conference is to provide a forum for the discussion of research within business and reference disciplines in the social sciences. A secondary but important objective of the conference is to encourage the cross pollination of disciplines by bringing together professors, from multiple countries and disciplines, for social and intellectual interaction.

Prior to this year, the Academic Business World International Conference included a significant track in Learning and Administration. Because of increased interest in that Track, we have promoted Learning and Administration to a Conference in its own right. For the full call for papers and more information go to http://ABWIC.org and http://ICLAHE.org

International Conference on Learning and Administration in Higher Education (ICLAHE.org)

All too often learning takes a back seat to discipline related research. The International Conference on Learning and Administration in Higher Education seeks to focus exclusively on all aspects of learning and administration in higher education. We wish to bring together, a wide variety of individuals from all countries and all disciplines, for the purpose of exchanging experiences, ideas, and research findings in the processes involved in learning and administration in the academic environment of higher education.

We encourage the submission of manuscripts, presentation outlines, and abstracts in either of the following areas:

Learning

We encourage the submission of manuscripts pertaining to pedagogical topics. We believe that much of the learning process is not discipline specific and that we can all benefit from looking at research and practices outside our own discipline. The ideal submission would take a general focus on learning rather than a discipline-specific perspective. For example, instead of focusing on "Motivating Students in Group Projects in Marketing Management", you might broaden the perspective to "Motivating Students in Group Projects in Upper Division Courses" or simply "Motivating Students in Group Projects" The objective here is to share your work with the larger audience.

Academic Administration

We encourage the submission of manuscripts pertaining to the administration of academic units in colleges and universities. We believe that many of the challenges facing academic departments are not discipline specific and that learning how different departments address these challenges will be beneficial. The ideal paper would provide information that many administrators would find useful, regardless of their own disciplines

Conferences

Prior to this year, Learning and Administration was a primary track of the annual Academic Business World International Conference. Because of increased interest, we have promoted Learning and Administration from a Track to Conference in its own right. For the full call for papers and more information go to http://ICLAHE.org and http://ABWIC.org.