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Motivation, Innovation, and Collaboration: Student Response to Assignment Choice and Collaborative Learning Experiences

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Abstract

The purpose of this pilot study was exploratory and sought to understand the dichotomy between current literature, which was suggestive of positive influence in student learning in both innovation and collaboration experiences with direct observational experience. Furthermore, this study sought to understand the relationship between innovation and student assignment choice along with collaborative learning experience as it related to student perception and beliefs in valuation. Because this pilot study was contained to a small sample population without normal distribution, nonparametric statistical analysis was chosen as the best tool for analysis of the survey data. The sample is not representative of a more diverse population where the results may prove more significant. The results illuminated the need for further research in affective learning as it intersects student motivation when it comes to innovation in the classroom, curriculum, and course design.

Keywords: Affective learning, motivation, innovation, collaborative learning

Motivation, Innovation, and Collaboration: Student Response to Assignment Choice and Collaborative Learning Experiences

The topic of student motivation in assignment innovation and collaborative learning groups first came to my attention while I was working for a major online university as an online enrollment advisor. I listened to many students complain about the required collaborative learning group (CLG) assignment that was a component of every online course offered by the university during my time as an advisor. The student complaints centered on the following aspects of the collaborative learning experience:

- Why they felt collaborative learning assignments were not fair (e.g. group grades instead of individual grades)
- Why the workload in groups always ended up unbalanced (e.g. some members providing more work than other members)
- Concerns over the stress of working collaboratively with non-communicative members
- The belief that the CLG experience was insignificant to qualify as a valuable use of their time

While I sympathized with my students, I attempted to tell them why I believed that collaborative learning assignments were valuable preparation for real-world experience (in post education work). I shared my thoughts that the opportunity to develop communication skill is best utilized in a cooperative learning environment (McKeachie, 1999). Nonetheless, the students continued to complain about their group experience, and when surveyed by the university, consistently rated it as the least liked part of their online learning program.

More recently, I had the opportunity to begin teaching at a local Christian university, where part of the required coursework consisted of a collaborative learning assignment using the online learning management system (LMS). The course curriculum objective was to encourage students to innovate, to be creative with the assignment, and to choose the overall design (subject matter and content) as well as the choice of presentation method (digital media). My instinct suggested that the students would react in a similar way to the online university students I had advised and be vocally against the collaborative nature of the assignment. Additionally, I believed that the students would welcome the opportunity to design their own assignment, preferring control over the content and that they would view choice in assignment as a strong motivator for their success.

Interestingly enough, what I observed with my traditional classroom students seemed to contradict what I had observed with my online students. The online students clearly did not favor collaborative projects, while the traditional students seemed to welcome the opportunity to work in a group. The online students enjoyed the freedom to explore and to create their own assignments (often citing how they liked it when they were allowed to creatively express themselves using media).The traditional students, on the other hand, seemed more concerned over having to design a creative project and present it to their peers. Observation aside, the current literature from Educational Technology, Educational Psychology, and Communication journals strongly asserted that students do enjoy collaborative learning assignments and that students welcome the opportunity to actively participate in their learning experiences (Shen, Wang & Shen, 2009).

The purpose of this pilot study was exploratory and sought to understand the dichotomy between current literature, which was suggestive of positive influence in student learning in both innovation and collaboration experiences with direct observational experience. Furthermore, this study sought to understand the relationship between innovation and student assignment choice along with collaborative learning experience as it related to student perception and beliefs in valuation.
The following research questions formed the basis of this pilot study:

R1:Is there a relationship between student choices in course material that arouses curiosity and student choice in assignments that they can learn from regardless of getting a good grade.
R2:Is there a relationship between collaborative learning groups help with learning to work effectively in groups and the belief that collaborative learning groups help with learning how to work in groups in a post educational setting.
H0: There is no difference between student age and perception of interest and valuation of innovation and collaborative learning group experiences.

Review of Literature

Scholars in the field of Educational Psychology have suggested that there are three general categories of learning or domains: Cognitive, Affective, and Psychomotor. Bloom's Taxonomy states that cognitive learning relates to the ability to process information such as "the recall or recognition of specific facts, procedural patterns, and concepts that serve in the development of intellectual abilities and skills" (Bloom, 1956). Affective learning or affective domain relates to "attitudes of awareness, interest, attention, concern, and responsibility, ability to listen and respond in interactions with others, and ability to demonstrate those attitudinal characteristics or values which are appropriate to the test situation and the field of study" (Krathwohl, 1964).Psychomotor learning relates to physical movement, coordination, and use of the motor-skill areas. Additionally, innovation relates to the creation of ideas, to design or the development of new process or methods. Understanding student motivation as it relates to innovation, therefore, requires exploration into the affective domain where attitudes and beliefs intersect with cognitive and psychomotor learning.

Affective Learning and Student Perception

The study of student learning modes has been well-documented. Student motivation has also been the subject of much research as it pertains to classroom learning strategies, curriculum design, and communication. The interest in understanding motivation and its influence on learning objectives and outcomes has also been the focus of significant research across multidisciplinary boundaries. Motivation as an interdisciplinary area of research involves outward environmental influences as well as the more difficult, subjective inward influences such as attitude, interest, and belief.

In communication research, differentiating between attitude and belief is key. McCroskey (2006) addresses this intersection when he writes; "A distinction frequently made is that attitude relates to the affective component of response, while belief relates to the cognitive component" (p. 39). Furthermore, he suggests, "The terms affective and cognitive may be loosely interpreted as referring to feeling and thinking. An attitude is an evaluation of an attitude-focus. A belief, on the other hand, is the degree of probable truth that we assign to a focus" (p. 39). The role of attitude and belief as it intersects with motivation becomes a critical component to any research whereby the result is to gain understanding of student intention and attitudinal outcomes.

Affective Learning on Motivation

External influences on motivation such as teacher-student communication practices, teacher immediacy, and adaptive classroom strategies suggest that the role of teacher "may have its strongest impact on affective learning" (McCroskey, 1999, p. 1). Furthermore, McCroskey and Chory (1999)suggest that teacher communication is important to student motivation in the classroom (p. 1). Their research in affective learning and instructor communication posited that teachers with a student-centered approach are more likely to influence student affective learning (p. 2).Moreover, the authors state that students who are "involved in course-related decision making" take a "more active role in their education" (p. 2). The research suggests that students are more interested in participation, in class assignments, when they are given the ability to choose their learning and educational outcomes.

Affective Learning on Innovation

Picard, Papert, Bender, Blumberg, et al. (2010) have stated "Scientific findings over the past decade have started to lay the foundation for a better understanding of the role of affect in learning" thus suggesting a positive correlation between mood and critical thinking, creative and flexible problem solving and decision making (p. 254). Picard et al. does stress the need for more precise theories and constructs especially when considering the role of technology on affective learning in the traditional and online learning classroom (p. 254).Moreover, the authors write, "respect to motivation in learning, there has been much more work and much more progress, illuminating the role of intrinsic versus extrinsic influences, the influence of how pleasurable past learning experiences have been, the feeling of contributing to something that matters and the importance of having an audience that cares, among other factors" (p. 255). Determining how innovation intersects with student motivation is an area least understood because it draws upon the intrinsic affective influences related to attitude and belief.

Estrada, Isen, and Young (1994) have indicated that positive affect increases motivation. They write, "Research in social psychology suggests that induction of positive affect exerts significant effects on several aspects of social behavior and thought processes" (p. 286).Likewise, Isen (2001) suggests, "in most circumstances, positive affect enhances problem solving and decision making, leading to cognitive processing that is not only flexible, innovative, and creative, but also thorough and efficient" (p. 75). Innovation is a key component in the creative problem-solving context thus allowing for the formation, discussion, and developing of new ideas, which support and encourage learning outcomes.

In addition to instructor communication, teacher immediacy and enthusiasm have been shown to increase student positive response in learning environments along with well-designed courses and curriculum (Davis, 1993).

Christophel (1990) studied the impact of teacher immediacy on student motivation and concluded that there was a strong influence between teacher communicative practices and student behavior and learning outcomes (p. 324). Research has long suggested the integral role of teacher communicative practices on affective learning in the classroom. However, student attitudinal research has found it difficult to measure intrinsic measures such as self-efficacy and has viewed them as a clustered component of the overall affective learning domain (McCroskey, 1994). Moreover, student role in innovation has not been fully researched outside of studies whereby teacher communication, educational design, and psychology focus on motivation.

Extrinsic motivators such as participation grades, parent or peer approval, and overall GPA performance are normally considered as factors in encouraging student engagement, in the classroom. Intrinsic motivators such as curiosity, improvement, knowledge and learner satisfaction often replace extrinsic motivators once the student leaves the classroom. Moreover, peer-to-peer interaction is an important motivator for many students. Collaborative learning experiences give students the opportunity to learn from others and can reinforce learning in the classroom or online learning environment (McKeachie, 1999).

Affective Learning on Collaborative Work Groups

Collaborative learning, defined by Sadera, Robertson, Song, and Midon (2009),is a form of social relationship or community. They state "we define community as a group of participants, relationships, interactions and their social presence within a given learning environment" (p. 2).Student cooperative learning, therefore, resembles a social act (Gerlach, 1994) wherein student exposure to different viewpoints and perspectives occurs, much as if the student was engaged in any social setting (Smith and MacGregor, 1992). Student learners are challenged socially and emotionally and as such are able to engage in the dynamic conversation, discuss learning constructs, and through communicative practices are able to strengthen the learning process and assimilation of new information.

As we consider affective learning on student motivation in innovation and collaborative learning environments we will gain understanding of how students perceptions relate to intrinsic motivators such as curiosity, improvement, knowledge and learner satisfaction, which are important once the student leaves the classroom for post educational work (McKeachie, 1999).

Methods

Sample

The pilot study consisted of a sample population of 64 college students who responded to a recruitment e-mail message to complete the online survey. Participants were informed as to the voluntary nature of the survey study and they were assured as to the confidentiality of their responses. An initial response question was asked to determine if participants had taken an online course. If the participant answered no to this question, he or she exited the survey. Only participants answering yes to this initial question were included in the analysis of the survey data.

Measures

A student survey questionnaire was constructed from the "Motivated Strategies for Learning Questionnaire" (MSLQ),designed for assessing college students' motivational perceptions and their use of different learning strategies including cognitive and affective domain (McKeachie, Pintrich, & Lin, 1985;Pintrich, McKeachie, &Lin, 1987). The MSLQ survey instrument included81 questions divided into six sections: intrinsic goals, extrinsic goals, task value, control of learning beliefs, self-efficacy for learning and performance, and test anxiety. A slight modification from the 1990 version was made to include questions about the use of online learning management systems (LMS), student demographics, and the collaborative learning experiences.

To measure student perceptions of motivation, innovation, and collaborationa shortened version of the MSLQ survey instrument was created with57-items using a combination of values (yes/no response, 5-point responses, multiple choice, and freeform text answers).

The first section consisted of 29 student motivation and innovation questions. These scale questions relied on a 5-point Likert scale consisting of responses:

1. Strongly Disagree (I disagree all or almost all of the time)
2. Disagree (I disagree most of the time)
3. Neutral (I neither agree or disagree; no opinion)
4. Agree (I agree most of the time)
5. Strongly agree (I agree all or almost all of the time)

Scale scores of five indicate positive perceptions toward student motivation in innovation and collaboration while scale scores of one indicate less positive perceptions. The second section consisted of eight online learning self-efficacy multiple-choice questions. The third section consisted of 14 collaborative learning group questions with the majority of the scale questions requiring a 5-point Likert response. The remaining questions were yes/no response or freeform response. The fourth section consisted of four demographic questions: gender, age, class level, and ethnicity. This 57-item scale revealed an acceptable internal consistency of scores obtained from the scale with $\alpha = .785$. A score reliability of .70 or better is acceptable, according to Nunnally (1978).

Because this pilot study was contained to a small sample population without normal distribution, nonparametric statistical analysis was chosen as the best tool for analysis of the survey data. The data was collected using Qualtrics, an online survey tool. Once the data was extracted it was entered in IBM SPSS® for analysis.

Results

The demographic related questions from the survey were analyzed with descriptive statistics to better understand the sample population in terms of our independent variables, gender, age, class level, and ethnicity. The majority of the students were classified as having taken an online course (65.6%, n = 42) with the remaining (34.4%, n = 22) students answering no to the initial qualifying question. Of those 42 who answered yes to the qualifying question, approximately 17.2% percent of the participants identified themselves as male (n = 11) and 48.4% as females (n = 31) as shown in Table 1. Moreover, 28.1% percent of the participants classified their age as 18-24 (n=18) with 15.6% (n = 10) percent of the participants classified their age as 25-34 as shown in Table 2. Nearly, 26.6% (n = 17) of all participants classified themselves as graduate students. The majority of students listed their ethnicity as mostly Caucasian (48.4%, n = 31).

Table 1
Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	11	17.2	26.2	26.2
	Female	31	48.4	73.8	100.0
	Total	42	65.6	100.0	
Missing	System	22	34.4		
Total		64	100.0		

Table 2
Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-24	18	28.1	42.9	42.9
	25-34	10	15.6	23.8	66.7
	35-44	7	10.9	16.7	83.3
	45-54	6	9.4	14.3	97.6
	55 or older	1	1.6	2.4	100.0
	Total	42	65.6	100.0	
Missing	System	22	34.4		
Total		64	100.0		

To evaluate the normality of data, the Kolmogorov-Smirnov Test was run to know whether the sample data is consistent with a specified distribution function.Q17 (Innovation-Curiosity), Q24 (Innovation-Assignment Choice), Q49 (Collaboration Learning), and Q50 (Collaboration-Post Education) scores were not normally distributed for males and females, as assessed by Kolmogorov-Smirnov's test ($p < .05$). Thus, we can reject the null hypothesis stating that the data is normally distributed.

To help in answering the first research question: Is there a relationship between student choices in course material that arouse curiosity and student choice in assignments that they can learn from regardless of getting a good grade, a correlation analysis was used to determine any relationship between these two dependent variables. Items for this analysis included question 17 (In an on-line class, I prefer course material that arouses my curiosity, even if it is difficult to learn) and question 24 (When I have the opportunity, I choose assignments that I can learn from even if they don't guarantee a good grade).

A Spearman's rank-order correlation was run to assess student choice in course material that arouses curiosity and student choice in assignments that they can learn from regardless of grade. Preliminary analysis showed the relationship to be monotonic, as assessed by visual inspection of a scatterplot. There was a weak positive correlation between student choices in course material that arouse curiosity and student choice in assignments that they can learn from regardless of grade, r_s (40) = .141, $p > .05$ as shown in Table 3.The data show no statistically significant relationship, however, the positive correlation between variables suggests perceived learning is affected by students' interest in choice of course material that arouses curiosity and their choice of learning assignments. The more opportunity a student has to be invested in the course decision-making process and the more they actively participate in assignment choice, the more they feel they control their education and learning outcomes.

Table 3
Correlations

		In an on-line class, I prefer course material that arouses my curiosity, even if it is difficult to learn.	When I have the opportunity, I choose assignments that I can learn from even if they do not guarantee a good grade.
Spearman's rho	In an on-line class, I prefer course material that arouses my curiosity, even if it is difficult to learn. Correlation Coefficient	1.000	.141
	Sig. (2-tailed)	.	.372
	N	43	42

	When I have the opportunity, I choose assignments that I can learn from even if they do not guarantee a good grade.	Correlation Coefficient Sig. (2-tailed) N	.141 .372 42	1.000 . 42

To help answering the second research question: Is there a relationship between CLG's help with learning to work effectively in groups and the belief that CLG's help with learning how to work in groups in a post educational setting, a correlation analysis was used to determine any relationship between these two dependent variables. Items for this analysis included question 50 (Collaborative Learning has helped me to learn to work effectively in groups) and question 49 (Collaborative learning is helpful training for post educational work).

A Spearman's rank-order correlation was run to assess the relationship CLG's help with learning to work effectively in groups and the belief that CLG's help with learning how to work in groups in a post educational setting. Preliminary analysis showed the relationship to be monotonic, as assessed by visual inspection of a scatterplot. There was a strong positive correlation between CLG's help with learning to work effectively in groups and the belief that CLG's help with learning how to work in groups in a post educational setting, r_s (40) = .645, p< .001 as shown in Table 4. The data show a statistically significant relationship and a strong positive correlation between these variables suggests perceived learning is affected by students' belief that CLG's help with learning to work effectively in groups and their belief that CLG's help with learning how to work in groups in a post educational environment. Student belief in the value of collaborative learning opportunities supports their belief that they will be able to better work within groups once they graduate from college.

Table 4
Correlations

			Collaborative learning is helpful training for post educational work.	Collaborative Learning has helped me to learn to work effectively in groups.
Spearman's rho	Collaborative learning is helpful training for post educational work.	Correlation Coefficient Sig. (2-tailed) N	1.000 . 42	.645** .000 42
	Collaborative Learning has helped me to learn to work effectively in groups.	Correlation Coefficient Sig. (2-tailed) N	.645** .000 42	1.000 . 42

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

To help in answering the hypothesis H0:There is no difference between student age and perception of interest and valuation of innovation and collaborative learning group experiences, aKruskal-Wallis test (Criteria alpha=0.05, CILevel=95) paired question 55, the independent variable (IV) gender with each of the dependent variables (DV) in questions 17, 24, 49, and 50.

In the first paring, Q17 and Q55, the course challenge to arouse curiosity score increased in age group 25-34 (*Mdn* = 4.50), decreased in age group 18-24 (*Mdn* = 4.00), 35-44 (*Mdn* = 4.00), 45-54 (*Mdn* = 4.00), and 55 and older (*Mdn* = 3.00), $\chi^2(4) = 3.472$, $p = .482$.

In the second paring, Q24 and Q55,the choice of assignment score increased from age group 18-24 (*Mdn* = 3.00), 25-34 (*Mdn* = 3.00), 35-44 (*Mdn* = 4.00), 45-54 (*Mdn* = 4.00), to 55 and older (*Mdn* = 4.00), $\chi^2(4) = 3.780$, $p = .437$.

The third paring, Q49 and Q55, the belief that CL is helpful for post education work showed no increase in age groups: 18-24 (*Mdn* = 4.00), 25-34 (*Mdn* = 4.00), 35-44 (*Mdn* = 4.00), 45-54 (*Mdn* = 4.00), to 55 and older (*Mdn* = 4.00), $\chi^2(4) = 2.525$, $p = .640$.

The last paring, Q50 and Q55, the belief in the value of CL on learning to how to work effectively in groups showed variation in ages 18-24 (*Mdn* = 3.00), 25-34 (*Mdn* = 4.00), 35-44 (*Mdn* = 3.50), 45-54 (*Mdn* = 3.00), to 55 and older (*Mdn* = 4.00), $\chi^2(4) = 4.526$, $p = .339$.

Initial data analysis showed no significant differences in the DV (Age) and the IVs, with only a slight increase or decrease in various age groupings. Overall, there was no measurable difference in age groups when paired with each independent variable. Thus, additional research is needed before definite assertions can be made because of the small number of participants in each age range.

Discussion

The positive correlation between student choice of course material and choice in assignment decision-making suggests perceived learning is affected by students' motivation and interest in innovation. The more opportunity a student has to be invested in the course decision-making process and the more they actively participate in assignment choice, the more they feel they control their education and learning outcomes. This result supports the findings of Picard et al. (2010) where research suggested a positive correlation between mood and critical thinking, creative and flexible problem solving and decision-making (p. 254). Students are more interested in learning experiences when they are offered the ability to innovate (create ideas and outcomes) based on student choice of assignments. Though there was a weak correlation between student choice of course materials that arouses curiosity and student ability to choose course assignments regardless of grade, the data suggest that further research would be necessary to determine the significance based on a larger population study.

Similarly, a strong positive correlation between CLG's help with learning to work effectively in groups and the belief that CLG's help with learning how to work in groups in a post educational setting suggests that perceived learning is affected by students' belief that CLG's help with learning to work effectively in groups and their belief that CLG's help with learning how to work in groups in a post educational environment. Student belief in the value of collaborative learning opportunities supports their belief that they will be able to better work within groups once they graduate from college. This result supports Sadera et al. (2009) definition of collaborative learning as a community whereby members interact with each other as they are challenged socially and emotionally and are able to engage in a dynamic conversation, discuss learning constructs, and through communicative practices are able to strengthen the learning process and assimilation of new information.

Splitting the demographic data by age as it relates to our variables under study suggests adult learners over the age of 25 are more likely to be motivated by choice of courses that arouse curiosity, as well as the choice of course assignment. Similarly, splitting the data by ageas it related to collaborative learning groups suggested students with work experience or corporate work believed that their learning increased based on their efforts in a collaborative learning group project. Moreover, students aged 25-34 and those 55 and older believed that collaborative learning group experience helps with post education work whereas the other aged students were neutral or disagreed. Perhaps these students had poor work experience and believed their collaborative learning was negatively impacted by their post educational work.

Future Research

To enable understanding of the effects of student motivation in innovation and collaborative learning groups further research is needed. Experimental design studies examining the relationship between groups of participants in courses that encourage innovation versus courses that do not will help researchers and educators develop a complete view of whether student motivation, innovation and collaboration is influenced by affective learning. If we develop studies to explore innovation in classroom curriculum design, instructor communication, and student learning outcomes, we can create new learning opportunities to strengthen student learning and enhance outcomes for all students involved.

Conclusion

The results from this pilot study illuminated the need for further research in affective learning as it intersects student motivation when it comes to innovation in the classroom, curriculum, and course design. The data show that a positive relationship exists between students' interest in the choice of courses that arouse curiosity and their ability to make decisions on assignment choice. Furthermore, this study suggested that students do believe that CLGs help with learning and that they do believe that they help when it comes to learning how to function in post education work groups. Limitations to this work include small sample size along with demographics focused particularly on mostly Caucasian graduate students. The sample is not representative of a more diverse population where the results may prove more significant. Additionally, the survey instrument while constructed to measure specific scales known historically to form motivation and affective learning outcomes, could be tailored to consider more strongly the influences specific to innovation and collaboration.

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