

Positive Social Dynamic Predictors of Student Learning

Susan Talley

Learning is the main goal of any class. Therefore, value is found in assessing different variables that may influence and predict student learning. In the current study this assessment included both affective learning and cognitive learning as reflected by the participants' grades. Possible correlations among variables that predict student learning were also assessed. Previous research shows positive correlations between student learning and immediacy, rapport, working alliance, and citizenship behavior (Myers et al., 2016; Rogers 2015; Wilson, Ryan, & Pugh, 2010). But to date, no study has examined the influence of all of these variables on learning in one equation. Many similar studies typically include one student learning measure or only assess one type of student learning. Others are limited to a single course or one type of course. In the current study, we assessed these predictors in terms of how they relate to both affective and cognitive student learning in a variety of courses. Understanding possible predictors of student learning provides insight for improving instruction in the classroom environment, consequently increasing student learning.

Student Learning

Student learning has been defined as “the gains in the knowledge or skills that a student possesses” (Bacon, 2016, p. 3). An area of concern within this field of research is the two distinct ways of assessing student learning: cognitive learning and affective learning. Cognitive learning is the amount of knowledge gained or a change in knowledge (Kraiger, Ford, & Salas, 1993). Cognitive learning is often measured with pre- and post-tests, GPA, and/or course grades. Affective learning is how much one feels he or she has learned rather than the actual amount of knowledge gained. Affective learning involves motivation and self-efficacy, which are not

included in measures such as course grades. Therefore, perceived learning uses self-report measures of learning based on participants' reflection on how much they considered they have learned, as demonstrated by the finding of a strong correlation between these self-reported measures and affective learning (Sitzmann et al., 2010). Sitzmann and colleagues found no relationship (no correlation) between perceived learning and actual learning. An accurate assessment of student learning is important to ensure that we understand what variables impact learning. In the current study, both cognitive and affective learning were assessed to provide more insight into how the predictor variables influence learning.

Previous studies have used various means to quantify and calculate cognitive and affective learning. A simple approach is to use the corresponding numbers (e.g., grades, student evaluations, etc.) obtained during data collection. Rogers (2015) collected numerical grades and treated those numbers as a scale ranging from 0 to 100. This simpler approach can also be seen with measures of affective learning, where the corresponding numerical response on a 5-point scale is used in the statistical analyses (Rogers, 2015; Wilson Ryan, 2013; Myers et al., 2016). Frymier and Houser (1999) alternatively converted letter grades to a 4.0 grade scale.

Additional factors that have been shown to positively correlate with different measures of student learning include immediacy (Christophel, 1990), rapport (Wilson & Ryan, 2013), working alliance (Rogers, 2015), and citizenship behavior (Myers et al., 2016). The next step is to understand their relationship with student learning as well as examine the relationship among these factors themselves. Understanding potential links between these various factors will advance our understanding of them and the nature of their impact on student learning.

Immediacy

When an instructor appears relaxed, smiles, and spends time with students, the behaviors convey a message to students that the instructor is actively engaging with them and the class

(Andersen, 1986). The use of such behaviors is known as immediacy and is comprised of two parts: verbal and nonverbal behaviors (e.g., Christophel, 1990). Verbal immediacy is comprised of behavior such as use of humor, asking questions, or using personal examples. Nonverbal immediacy includes behavior such as smiling, a relaxed body position, and using vocal expressions. Immediacy, through its influence on student state motivation, is predictive of student affective and cognitive learning (Christophel, 1990). Not only do students typically like instructors who display immediacy, they are also more inclined to work harder and perform better in those classes (Lucas & Bernstein, 2014). A positive correlation also exists between immediacy and rapport, both of which predicted affective learning and attitudes towards the course and the professor (Wilson, Ryan, & Pugh, 2010).

Rapport

Rapport has been defined as “relation characterized by harmony” (*The Merriam-Webster’s dictionary*, 1997, p. 607). This type of relationship includes key factors such as caring, friendliness, and attentiveness, all mutually exhibited and perceived by both parties (Altman, 1990). The Professor-Student Rapport Scale was developed to assess this construct as it exists in the context of college instruction (Wilson, Ryan, & Pugh, 2010). This scale includes aspects of student engagement to assess rapport in the classroom. Constructs such as immediacy and working alliance have been found to positively correlate with this Professor-Student Rapport Scale (Ryan, Wilson, & Pugh, 2011; Myers et al., 2016). Good rapport between students and professors has also been shown to uniquely predict student attitude towards the course and professor, motivation, classes missed, affective student learning, and final course grades. (Wilson & Ryan, 2013).

Learning Alliance

Typically, working alliance has been applied to the collaborative relationship between an individual and a practitioner in the context of psychotherapy (Bordin, 1979). With this usage, the two key components of the working alliance are the individual as a person who is seeking change and the practitioner as the change agent, or a person who facilitates that change. It was reasoned that this kind of relationship is paralleled in the classroom, with a student as the one who is seeking change through learning, and the instructor as the one fostering learning (Ursano, Kartheiser, & Ursano, 2007). With cooperation between the student and the instructor, effective cognitive and affective student learning can be facilitated, and learning goals can be achieved.

A self-reported measure for this type of working alliance, known as the Learning Alliance Inventory (LAI) was developed by Rogers (2012, 2015) and then re-examined for validity. Though learning alliance is its own unique construct, it takes other constructs, such as rapport and immediacy, into consideration. In the relationship between students' effort to learn and instructors facilitating the learning, Rogers incorporates aspects of immediacy and rapport, such as a perception of caring and understanding. In order to establish this collaborative bond, a positive perception (immediacy) and relationship (rapport) has to be established first, as seen in the path analysis conducted by Rogers (2015).

Classroom Citizenship Behavior

When students engage in unrequired behaviors that contribute to a positive classroom climate without expectation of compensation, it is known as classroom citizenship behavior (CCB) (Myers 2012). Myers and colleagues (2016) determined that students use citizenship behaviors in the classroom in their interactions with the teacher and other students. Though the students do not gain an immediate and direct reward, they have a chance to indirectly gain a positive outcome either individually or as a group in the future, specifically learning and a more

positive learning environment (Myers et al., 2016; Organ, 1997). Myers and colleagues (2016) found that all three subscales of CCB positively correlated with instructor rapport, class climate perception, affective learning, and state motivation.

The Current Study

Previous studies have investigated various combinations of immediacy, rapport, working alliance, and CCB. All of these constructs have been found, either by themselves or in various combinations, to predict some form of student learning (cognitive and/or affective learning). Previous literature has also indicated that many of these constructs are positively correlated with each other, though not always directly. In the current study, relationships among these variables were examined, and we hypothesized that positive correlations would be found between all of the primary scales and subscales. To date no study has included all these constructs to predict student learning. In light of this deficit, the primary goal of the current study was to determine the relative ability of each construct to predict student learning. Previous studies have also been limited to just one class or course. The current study included a broader approach such that the participants provided information from a variety of courses, thus enhancing generalizability.

METHOD

Participants

There were 332 undergraduate students from a southeastern university in this study.

Materials

Criterion variables.

Cognitive student learning. To assess actual student cognitive learning, participants reported the final letter grade they received in a previous course. This final letter grade was converted to a 4.0 scale, ranging from 0.0 (for “F”) to 4.0 (for “A”) (Frymier & Houser, 1999).

They also provided the final grade in terms of percentage, which was treated as a scale number ranging from 0 to 100 (Rogers, 2015). These items were included at the end of the demographics questionnaire (see below).

Affective student learning.

Two different measures of affective learning were used because each one measures different perceptions of affective learning. We used a measure of how much the student felt he or she learned and a measure of how much the student felt he or she could have learned. By using two different measures of affective learning, we can better illustrate which constructs relate to affective learning in general, rather than a specific measure (and therefore a specific component) of affective learning.

Learning loss. We assessed learning loss (Richmond, Gorham, & McCroskey, 1987; Christophel, 1990). Students reported how much they learned compared to other classes and how much they think they would have learned if they had the ideal instructor. The difference in these scores is learning loss and was used as a measure of affective student learning.

Revised Learning Indicators Scale. The Revised Learning Indicator Scale, or RLIS, (Frymier & Houser, 1999), was also used to assess affective student learning. It is a self-report, seven-item scale on which participants rate how much they engage in learning. Items are rated on a five-point Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The reported Cronbach's alpha was 0.912.

Predictor variables.

Immediacy scale. The immediacy scale (Gorham & Christophel, 1990) is a 23-item measure divided into two subscales based on the two forms of immediacy: verbal (17 items) and

nonverbal (6 items). The items are rated on a five-point Likert scale, ranging from zero (*never*) to four (*very often*). The reliability was reported as 0.906.

Professor-Student Rapport Scale. The brief version of the Professor-Student Rapport Scale (PSRS) is a six-item scale used to measure the student engagement component of rapport (Wilson & Ryan, 2013). The items are rated on a five-point Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Two items were reversed scored. The Cronbach's alpha was reported as 0.874.

Learning Alliance Inventory. The Learning Alliance Inventory (LAI) (Rogers, 2012) is an 18-item scale used to measure the working alliance perceived by students in relation to their instructor. It is comprised of three subscales, with six items each in collaborative bond, teacher competency, and student investment. The items are rated on a seven-point Likert scale, ranging from one (*not at all*) to seven (*very much*). The reported Cronbach's alpha value was .950.

Classroom Citizenship Behavior Scale. The Classroom Citizenship Behavior scale, or CCB scale (Myers et al., 2016) is a 23-item self-reporting measure of the use of the three different types of citizenship behavior in the classroom. Each item was rated on a five-point Likert scale, ranging from 0 (*never*) to 4 (*very often*). It is comprised of three subscales: Involvement (ten items), affiliation (nine items), and courtesy (four items). The Cronbach's alpha was .930.

Demographics. The demographics questionnaire assessed age, gender, year in school, ethnicity, and self-reported GPA. To address the course the participants were referring to when completing the measures, they were asked to provide information about that course; including, the course prefix, the name of the course, time of day, their estimation of the number of students

in the course, and the instructor's name. This form is also where they reported their actual grades for the cognitive learning measures.

Procedure

An online recruitment system was used to acquire participants. The data were collected on-line, and the participants received a link to the study after signing up. Participants first provided informed consent. Then they completed the demographics questionnaire. For the second half of the demographics questionnaire, the participants identified the last class for which they had a final exam, during the previous semester. They reported their final grade in that course, both as a letter grade and as a percentage. Then they completed the remaining measures in randomized order to prevent order effects. The participants were then debriefed and told to e-mail the researcher in order to receive credit for participating in the study.

RESULTS

Table 1. *Correlations between outcome variables and predictors.*

	FG - %	FG - L	RLI	LL	R	I	LA
Final Grade as a Percent	-						
Final Letter Grade, 4.0 Scale	.859**	-					
Revised Learning Indicators	-.173**	-.173**	-				
Learning Loss	-.180**	-.159**	.215**	-			
Rapport	.249**	.265**	-.398**	-.531**	-		
Immediacy	.181**	.174**	-.322**	-.416**	.728**	-	
Learning Alliance	.209**	.26**	-.430**	-.482**	.736**	.723**	-
Classroom Citizenship Behavior	.133*	.135*	-.245**	-.257**	.388**	.586**	.615**

*correlation significant at the .05 level; **correlation significant at the .01 level

Correlations

It was predicted that there will be correlations found among the variables. Table 1 shows the correlations between the learning measures and the primary variables. Significant correlations were found between all variables. The correlations were all negative for learning loss, because of the nature of the scale (it runs negative rather than positive). However, there

were also negative correlations for RLIS, which was not expected. Both affected learning measures were significantly and negatively correlated to both cognitive learning measures.

Regressions

Hierarchical regression analyses were conducted for each of the four learning outcome measures. These included the two measures of cognitive learning (letter grade and percent grade) and the two measures of affective learning (learning loss and learning indicators). Each regression included the four predictor variables. Rapport and immediacy were entered in block one due to the amount of literature supporting these variables as predictors of learning. Learning alliance was entered in block two because it uses components of rapport and immediacy within its theory. Classroom citizenship behavior was entered in block three because it relates to rapport and immediacy but does not contain these constructs within its theory.

Cognitive learning. The hierarchical regression revealed that rapport contributed significantly to the regression model for final grade as a percent, $B = 2.206, p < .05$. The hierarchical regression for letter grade had similar results, $B = .243, p < .01$. The other predictors in the model were not significant for either measure of cognitive learning.

Affective learning. With the learning loss measure of affective learning, rapport ($B = -.931, p < .01$) and learning alliance ($B = -.357, p < .01$) were found to be significant predictors in the final model, but neither immediacy nor CCB were significant predictors. For the revised learning indicators scale, there were similar results where rapport ($B = -.234, p < .05$) and learning alliance ($B = -.246, p < .01$) were significant predictors but immediacy and CCB were not significant.

DISCUSSION

Correlation

As predicted, all of the predictor variables were significantly correlated to all of the outcome variables, supporting previous literature. However, one of the outcome variables, revised learning indicators, had correlations in the opposite expected directions. Affective learning should be positively correlated with all the measures used, except for learning loss. However, the correlation with learning loss was the only positive correlation for RLIS. This is either indicative of the nature of affective learning as opposed to cognitive learning, or an indication that there was an issue in the distribution of this measure.

Regressions

Cognitive learning. In the hierarchical regression for variables predicting percent grade, rapport was the only variable that significantly predicted this measure of student learning in the final model (which includes immediacy, rapport, learning alliance, and classroom citizenship behavior). The regression analysis for letter grade showed similar results to that of percent grade.

Although correlation assesses the relationship between two variables, hierarchical regression examines the predictive relationship among several variables at once and is therefore influenced by the relationship between these variables. This is a possible reason why immediacy and learning alliance did not add significant predictive variance, though they both highly correlated with percent grade. A lack of unique variance might also be attributed to the nature of these constructs. Immediacy is a component of rapport and learning alliance, and rapport is a component of learning alliance and CCB (Rogers, 2015; Myers et al., 2016).

Affective learning. Rapport and learning alliance were both significant predictors for learning loss and revised learning indicators across all models. This indicated that the construct of learning alliance is sufficiently unique to maintain significance and is a better predictor of affective learning than cognitive learning. Affective learning involves motivation and self-

efficacy, which are reflective of the student investment component of learning alliance (Rogers, 2012). Because affective learning involves student engagement in the learning process, constructs involving student engagement (e.g., learning alliance) may become a significant predictor due to the relationship with the student engagement component of affective learning. Likewise, the rapport measure used in this study contains items related to student engagement (Wilson & Ryan, 2013), supporting the notion that student engagement may be related to affect in the learning process. Rapport and learning indicators also share a common affective component, as seen by items describing enjoyment of the class for the measure of rapport (Wilson & Ryan, 2013) and feelings of learning rather than knowledge gained for the measure of learning indicators (Frymier & Houser, 1999).

Implications and Applications

Overall, rapport was found to predict all four learning measures. Based on this findings, instructors should keep the class engaging by using class activities and encouraging class discussion. Class discussion allows for comments and questions from students, which may increase affective learning by improving both rapport and learning alliance. Consequently, by establishing rapport in the classroom, teachers can potentially improve both cognitive and affective learning. It is important to note that both affective and cognitive learning are important factors that will impact student ratings of instruction (Myers et al, 2016; Rogers, 2015; Wilson & Ryan, 2013). Instructors who establish rapport with their students are more likely to see higher levels of both affective and cognitive learning in addition to potentially seeing more positive student ratings of instruction. One way to establish rapport is to keep the impact of body language in mind. Not only is body language a factor of rapport, but it also represents non-verbal immediacy (Wilson & Ryan, 2013; Christophel, 1990). Having a body language that conveys

openness and willingness to converse with students will aid in improving rapport. Finally, rapport can increase by making the class more enjoyable and engaging. This can be accomplished through the use of demonstrations, class activities, and other forms of student participation that allow the student to actively engage with the course topic. Another way to build rapport includes encouraging student feedback and questions.

Limitations and Future Directions

One limitation to the current study was not considering course structure. As mentioned above, CCB behaviors are supposed to be voluntary behaviors, but some instructors may require the behaviors in their classroom (Myers et al, 2016). This requirement of CCB may impact not only the engagement in these behaviors, but the students' perspective of CCB and the instructor. Future studies should account for course structure to assess for differences in correlations as well as the potential to predict student learning. Course structure may also impact student-teacher interactions (Rogers, 2015), either supporting or hindering the development of learning alliance. Therefore, course structure should also be taken into consideration in future studies assessing learning alliance. Likewise, examining differences between class types, such as STEM and non-STEM courses, introductory level vs. capstone courses, etc., can provide more insight into the relationship between these predictor variables and student learning. This would be especially interesting to examine with online learning.

Finally, future studies wishing to examine the relationship between the predictor variables and student learning should consider examining social dynamics either in a multilevel setting or with a path analysis to determine mediator and moderator effects. It is possible that relationships among these variables and learning are the result of a specific variable influencing the strength of the relationship between another variable and learning (moderation) or that a

specific variable explains the relationship between another variable and learning (mediation).

Likewise, social dynamics may impact student learning differently depending on the type of school, the type of program, and other factors in levels that were not examined in the current study. These analyses may shed more light on the relationships between positive social dynamics and their role in student learning.

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