Examining How Cognitive and Affective Learning Strategies Change as Students Complete Coursework

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Abstract:

The current paper qualitatively examines how students thought about and completed coursework. In total, 53 undergraduate and graduate students participated in a two-semester study. The findings suggest students employ learning strategies, both cognitive and affective, which provide support to complete coursework. Time management skills and seeking an increasing comfort with content are the most cited cognitive and affective learning strategies. Students are keenly aware that grading could help and hinder learning and believed assignments are the best indicator of understanding but also may not be a valid performance measure. Practical applications to increase student involvement in teaching and learning are provided.

Key Words:

Scholarship of Teaching and Learning, Student Perception, Pedagogy, Cognitive and Affective Learning Strategies.

Introduction

An initial examination of education literature on teaching and student learning will find a variety of topics such as cognitive development (Granello, 2000; Granello 2002), affective learning (Bolin, Khramtsova & Saarnio, 2005), service learning (Kiener, 2008a; Mpofu, 2004), action research to improve teaching and student understanding (Kiener,2007; Koch and Arhar ,2002), problem based learning (Carone & Burker, 2007) and lifelong learning (Amick & Wesley, 1999). A common thread in the above research

is that increased attention in these areas can dramatically impact student understanding. When higher education faculty embrace education models that actively involve student participation, a shift from a teacher to a student centered classroom is emphasized. Student centered classrooms provide students with a greater voice in their education and can facilitate opportunities for students to become more aware of their metacognition (Verner & Lay, 2010). Making teaching more student-centered has the potential to enhance co-inquiry and student ownership in the learning process. A goal of co-inquiry and student ownership in learning is an opportunity for students to go beyond memorizing facts to creating learning dispositions.

The scholarship of teaching and learning (SoTL) provides an avenue for teachers and students to collaborate and frame questions that, when answered, will improve teaching and student understanding. Huber and Hutchings (2005) described SoTL as a process that

> invites faculty from all disciplines and fields to identify and explore those questions in their own teaching—and, especially, in their students' learning—and to do so in ways that are shared with colleagues who can build on new insights. In this way, such work has the potential to transform higher education… (pp. ix).

It seems only natural that the scholarship of teaching and learning (SoTL) emphasizes students and student understanding. Perhaps the greatest claim for including students in SoTL research is its potential to make student learning more visible. "Reflection. Metacognition. Learning how to learn. Whatever the language or lineage the idea of making students more intentional, self-aware, and purposeful about their studies is a powerful one. Such processes are key to deeper, more integrative learning…"(Huber & Hutchings, 2005, pp. 114). It would be hard to argue against the former statement; however, much of the current SoTL research examines teachers and teaching strategies (McKinney, 2007).

McKinney (2007) and Huber and Hutchings (2005) called for greater emphasis on students as a future focus of SoTL. In addressing this need, Werder and Otis (2010) edited a book describing ways to incorporate student voices into SoTL research. The book specifically addressed greater collaboration between students and faculty. Examples of collaborative student-faculty SoTL research included working with students to redesign a course, including students in all phases of research from question development to dissemination, and allowing students input into course assignments and content throughout the semester.

In addition, the following review illustrates some of the research that has examined the various ways students have been incorporated into the teaching and learning process. Kiener (2007) and Koch and Arhar (2002) employed action research as a means to capture student voices to better understand the teaching and learning process. Kiener (2007) sought to better understand how graduate counseling students learned beginning counseling skills. As the research progressed, students became co-investigators studying how they learned counseling skills and thus became more informed on how they learned. This research was the foundation for an emerging theory entitled "mutual engagement" where students and teacher mutually engage in the teaching and learning process (Kiener, 2008b, 2009). Koch and Arhar (2002) facilitated

students to develop and conduct their own action research to better inform their professional practice. When action research is utilized, active participation by all participants is seen as an integral component to successful research. Moreover, in successful action research the findings of the study can be implemented to benefit those involved. From this perspective both studies paralleled the principles of student centered classrooms and allowed students to have a greater impact on their learning.

Other research focused on increasing student learning by utilizing students primarily as participants. Tinnesz, Ahuna, and Kiener (2006) investigated a program designed to teach students to become active and dynamic learners. Active and dynamic learners are more aware of their educational strengths and weaknesses, goal directed, and persist when having difficulty. The study was conducted over four semesters and included 680 students. Researchers found the course did increase students' active and dynamic learning. Additionally, there were no significant differences in active and dynamic learning between gender, year in school, class section, or ethnicity, further supporting the hypotheses that the course was influential in increasing student learning strategies. Pogue and AhYun (2006) studied the effect of non-verbal teacher communication and credibility on student motivation and affective learning with 586 students. The research found students experienced higher levels of affective learning and motivation with teachers who were both high in non-verbal communication and credibility. In addition, affective learning was greater with teachers high in credibility and low in non-verbal communication than teachers high in non-verbal communication and low in credibility. These studies demonstrated students can learn how to learn and student perceptions of teachers impact future learning.

Adding to this discourse is student perception of the educational process, specifically grading and its connection to learning. Goulden and Griffin (1995) qualitatively examined student and teacher perceptions of grades. Their findings suggested that students had doubts about the validity of grades accurately demonstrating achievement, and students were more likely to view grading as judging as opposed to an indication of ability. Shim and Ryan (2005) studied 361 college students' perceptions of how grades impacted motivation and self-efficacy. The researchers found grades negatively impacted students when they compare themselves to others; however, when students viewed learning as self-development grades positively increased self-efficacy and intrinsic value. Grading and evaluation often cause anxiety for students and teachers, and communication regarding grading does have an impact on future learning experiences.

Although students have been directly and indirectly included into the research process a further commitment to investigate how students are thinking about their learning is called for to meet the need for students to become life-long learners and more aware of how they learn. An inductive research method provides a method to gather new information on how students can develop awareness of their learning. In addition, an inductive approach allows students to express their full range of ideas and experiences. Therefore, this research sought to employ qualitative methods to answer the question what students were thinking and understanding as they progressed through a semester. Gaining a deeper understanding of the research question would go

a long way to increase student-centered classrooms and student investment in their learning.

Method

Due to the nature of the research question a qualitative case study methodology was utilized. This methodology allowed for the participants to describe their experience and for a collective theme to emerge. Moreover, the principles of action research were employed as a lens to view the research process. Action research is common in teacher education as a method to study the teaching and learning process (Arhar, Holly, & Kasten, 2001). Action research provides a means for instructors to ask and answers questions based in the classroom with the goal of improved practice and increased student understanding.

Participants

All of the participants were from a small private mid-western university. In total 53, 8 undergraduate and 45 graduate students participated in the study. Of the graduate students, one was in Music Therapy and 44 were in Rehabilitation Counseling. Six of the undergraduate students were in Rehabilitation Services and the remaining students were in Psychology. There were 6 males, and 47 females, The majority of students were Caucasian (42), 6 were African American, one student was Asian American, and the students ranged in age from their early 20s to mid 50s. The study was conducted over two semesters in four different classes. Five of the students were enrolled in more than one of the classes that were a part of the study. All of the classes studied were graduate courses in the rehabilitation counseling program. The first author was the instructor for three out of the four classes studied. The fourth class was taught by another faculty member not involved in the study. The second author was a graduate assistant in the rehabilitation counseling program, and she was not enrolled in any of the classes under investigation.

Data

There were over 300 pieces of data collected. The data consisted of class focus groups, student interviews, observations by the first author, course assignments, and instructor planning and process notes. Focus groups were utilized in the beginning of the research process to develop questions and to get an initial sense of how students thought about and completed coursework. Some of the questions asked of the students included "how do you prepare for your first graded or non-graded assignment," "how does a grading system help or hinder the learning process," "how do you know you learned something," "do you consider yourself optimistic or pessimistic" and "how if at all does this influence your learning," and "how do you approach a new semester." During the research process, participants were asked to participate in individual structured interviews to gain additional context of the research question; three students volunteered to be interviewed. Two students were interviewed once, and one student was interviewed twice. All the interviews lasted about a half hour. These interviews were conducted towards the end of the second semester as a means to reach data saturation. Course assignments were utilized to assess how well students were

demonstrating their understanding. This was accomplished by examining how well assignments met course outcomes and how well students demonstrated their ability to apply coursework to new learning. Before each class, the first author developed a teaching plan emphasizing course content and student demonstrations of learning. After the class, the first author reflected on how the class met objectives and began to plan for the next class.

Data collection and analysis occurred simultaneously and data were constantly being compared to previous data to assess how well the data answered the research question. As a result of the ongoing analysis, new questions were developed to better answer the research question "what were students thinking and understanding as they progressed through a semester." In later stages of data collection and analysis, questions were developed to add greater richness and detail to the emerging theme. The data were collected by the first author, and any names were removed before the second author began analysis. Both authors analyzed the data separately and met throughout the research process to compare analyses. In addition, data was discussed with other researchers and member checking was employed to increase triangulation of the findings.

Findings

What emerged from the data as students started, progressed and completed their semester was a variety of learning strategies allowing students to think about, learn, and finish course work. Although no students specifically called their educational approach a learning strategy, the activities clearly described procedures that helped students manage and understand material. The learning strategies included a mix of cognitive and affective approaches.

Interrelated with these learning strategies were multiple factors that emerged throughout the semester contributing to how students thought about and completed course work. For example, students believed course assignments were the best indication of student understanding but also believed grades may not be a valid measure of their performance. Moreover students believed a grading system could hinder their learning but also felt a sense of accomplishment with high marks. Students also described a transition in their use of learning strategies. Early in this process, students reported their general apprehension, uncertainty about course requirements, and ability to plan for the semester. As the transition continued, students linked their learning to optimistic and pessimistic personality traits. At the close of the semester, students described an increasing value in applying coursework in the field and enjoyment in completing coursework. The remaining narrative will further describe student learning strategies and the process of how students transitioned in their use of learning strategies.

Cognitive Learning Strategies

A deeper examination of the learning strategies revealed a focus on time, grading, and planning and self-assessment. Time factors included finding time to complete assignments, determining due dates and thinking about the total time needed to complete assignments. Students described grading strategies in terms of the following

factors: knowledge of point values of assignments, instructor grading style, what the instructor is looking for, grading as a standard for high achievement, and answering questions correctly. For example, one student discussed counting points to determine effort and grade, another student assessed the value of an assignment based on the total number of points it was worth, while a third student discussed learning how to take a test (Student response). However, planning and self-assessment strategies included students thinking about prior knowledge as a means to begin thinking about an assignment, seeing a benefit related to future practice, knowing how to access information when needed, using assignments as a means to compare themselves to peers, utilizing rubrics, and reviewing course content to solidify key concepts (Student response).

Initially, it was unclear how students ranked or employed learning strategies. Students were asked to describe how they ranked time, grading, and planning and self-assessment as important to their learning. Students indicated time most frequently as most important to their learning with no clear distinction between the remaining strategies as a second choice. All students indicated aspects of at least two strategies. For example, one wrote "Time is most important because of everything else that is going on in real life. Then grading, not necessarily points but what the instructor is looking for, then planning and self-assessment." (Student response). While another student wrote

I think it is important to plan for a course and prepare yourself, but time is important in planning. When it comes to content and what you put into class/ assignments, the grading criteria can be important, but also, it can limit your horizons (Student response).

Although time was a highly used learning strategy, students were also keenly aware and could describe how grading helped and hindered learning. Positive examples of grading included the following factors: providing the opportunity to learn something new, establishing a structure and standard to gauge success, acting as external motivation, and receiving high marks as a sense of accomplishment. Negative examples included increasing undue anxiety (worrying about a grade and not learning), testing not being reliable tool for gauging learning, cramming, and decreasing motivation to learn once a desired grade is received.

For some students, grades provided opportunity for personal reflection and development. For example, students remarked "I would say that my learning is most definitely motivated by grades…However, at my age (39), this experience needs to be more about learning, as opposed to an actual letter grade", "I'd like to think my sheer desire to learn is all I need; however, a grading system adds another layer of motivation". "…a grading system gives me something to work towards. If there were just pass/ fail grades, then just working towards passing would be all that mattered…(grading) gives me a sense of accomplishment", "My personal learning is both increased and hindered by the grading system. I rate my intelligence off my academic performance so if I do poorly on a test, it can affect my confidence making school even more difficult", and "I think that it is important to be able to have that communication between faculty and students about their progress, strengths and weaknesses." (Student responses).

All of these strategies can be considered overt, concrete, and cognitive activities employed by students to help them better manage course work. It would be hard to argue that time, grading and planning and self-assessment were not important to completing course work and receiving a desired grade. However, it is also feasible to believe all the strategies were not equally beneficial to deep learning.

Affective Learning Strategies

A second set of learning strategies emphasizing emotion, future use, and personality traits emerged when students were asked to describe how they knew they had learned something. For many students this process was an internal feeling of being comfortable with course material. One student described this process as feeling "re-charged, interested and excited about our field" (Student response). In addition to a comfortable feeling, students discussed feeling validated, accomplished, interested, excited and confident in their ability to perform tasks related to course content.

Students also indicated that higher levels of comfort and access to instructors increased their likelihood of contacting instructors for clarification and a deeper understanding of course material. It is feasible to believe student emphasis on comfort level is connected to internal motivation and gaining self-awareness. One student wrote "As a result, my view becomes different and ever changing, and I learn something about myself through the process" (Student Response). Another student wrote "I think importantly I learned a couple of things about myself as well as research. That's a good thing." (Student response). This emotional identification and feeling comfortable parallels a core category in the emerging theory mutual engagement (Kiener, 2007). Comfortability is a process of students and instructor getting to know each other and developing an intellectual safe classroom where risks can be taken without fear of being ridiculed. As a result, once comfortability is reached, students and instructor can engage in challenging material at a deeper level (Kiener, 2007; 2009).

Another process that students identified as a means to assess if they learned something was future use. Students described having the ability to apply coursework in the field, holding conversations in other classes, having abstract thoughts click into place, and practicing material in day-to-day experiences. For example, one student knows she has learned something "when I catch myself talking about the subject matter outside of class or when I notice myself educating others about what I have learned" (Student response). Moreover, students based their awareness of learning on assessing how much they now know and realizing how much they did not know prior to class. One student wrote "if I would have been given this take home exam at the beginning of the year, there is no way I could have answered even one question…today, I found myself able to answer several questions off the top of my head." (Student response).

The language the students used to describe how they learned suggested a connection to personality traits such as optimism and pessimism. As a result, the researchers asked the students to identify if they believed they were optimistic or pessimistic and how, if at all, this impacted learning. The majority of the students indicated a connection with optimism. Five students connected to pessimism, and two students believed they were both optimistic and pessimistic.

It is not surprising that students who indicated they were optimistic had a more positive tone to their responses. For some students, optimism was a direct learning strategy that allowed them to handle life situations, complete work well, be open-minded, and increase analysis skills. Another prevailing comment from these students was their belief that things happen for a reason, good or bad, and, as a result, they benefited from the experience. Students also indicated this belief helped them with their learning by being flexible to learning processes, increase understanding, and applying course work in the field.

Students with a pessimistic approach divided their responses into two categories. The first category was pessimism as an approach to life or learning. A pessimistic approach to life made it easier to deal with life when bad things happened and "it just seems to make me look at life more realistically" (Student response). Similarly, a pessimistic life approach grounded individuals to expect the worst and be pleased when good things happened. Learning from a pessimistic attitude was not seen as a positive attribute. Students felt their work could always be better, did not set high standards of achievement, and avoided material that was not well understood.

Although students usually described commonalities in responses, two students, in part, described exceptions. One student wrote "There is a difference from just memorizing something for an exam and actually learning something," while another student wrote "I know I learned something because I was able to earn the grade that I am okay with. I was hoping for an A but will deal with an A-." Although both students discussed aspects of a grading system, they were on different ends of a continuum. For one student an A- meant learning occurred, while for the other student memorizing (as you might do for an exam) does not demonstrate learning. The students alluded to their awareness that for learning to occur they had to do something to demonstrate their ability / learning.

When comparing cognitive and affective learning strategies, clear distinctions can be made. Time, grading, and planning and self-assessment can be categorized as overt, highly cognitive, and individual. With these strategies, the student was largely responsible for organizing his or her semester, figuring out the instructor's grading style, and assessing progress. However the affective learning strategies were more affective, increased professional awareness, and were more collaborative with instructors. The latter learning strategies provided students opportunity to develop an affective appreciation in their ability as a learner and professional.

Student development and use of learning strategies allowed students to manage a wide range of experiences and emotions. Learning strategies included practical techniques (time management skills) and emotions used to deal with the unknown of the semester. As the semester progressed, students spoke of how their perceptions of classes were changing from uncertainty to certainty based on class structure and content benefiting professional practice. By the end of the semester students described being more positive about coursework and utilizing material in the field. Although students are developing learning strategies to manage and understand coursework, what is not clear is student awareness that these strategies can be used to better understand how they learn. In other words, should a more productive use of learning

strategies be focused on understanding and application of material as opposed to time management skills and grading?

Discussion

The current study sought to examine how students thought about and completed coursework. The findings suggested students employed a variety of learning strategies, both cognitive and affective, which provided support for students as they completed their semester. Time management skills emerged as the primary cognitive learning strategy, whereas seeking an increasing comfort with content was the most cited affective learning strategy. In addition, students were keenly aware that grading could help and hinder learning and believed assignments were the best indicator of understanding but also might not be a valid performance measure.

How this Research fits in the Larger Research Base

The various learning strategies the students employed have a direct relation to research on deep and surface approaches to learning (Biggs 1987; Entwistle & Ramsden, 1983; Marton & Saljo 1976a). Deep learners strive for mastery and have an intrinsic motivation to learn, whereas surface learners strive for completion and exhibit external motivation. Students who sought to apply content in the field and increased their comfort level with content could be considered to have used a deep learning approach, and students overly focused on grading could be considered as having used a surface level approach. Additionally, Marton and Saljo (1976b) found students may shift from surface to deep learning based on individual expectation and the value of the learning task. Similarly, how students think about grades should have a greater focus by instructors. Students' perceptions of grading not being an accurate measure of performance and negatively impacting student self-efficacy matched the findings of Goulden and Griffin (1995) and Shim and Ryan (2005). Creating assignments with student feedback may be one way to increase deep learning approaches and decrease the negative impact grades can have on students. In addition, assignments that are sequential and developmental provide opportunity for students to practice material throughout the semester while also asking students to demonstrate higher level thinking.

Moreover it is feasible to believe students did shift in their appreciation for learning and changed how they applied learning strategies as they progressed through the semester. Evidence of this shift can be gleaned from students' acknowledging a greater sense of certainty and comfort in course content and in their attempts to apply content in the field (Class observations and Student assignments). Increasing students' voice and participation in all aspects of coursework has the possibility to impact student value and perception of learning tasks positively. Therefore understanding how students are thinking is an important step in maximizing deep learning strategies and a student-centered classroom.

In addition, student learning strategies also have similarities to self-regulatory learning. Students who demonstrate self-regulatory learning have ability to plan, goal set, monitor learning; and as a result take a more active role in how they learn (van Den Hurk, 2006). The strongest connection to deep and surface approaches and self-

regulatory learning can be seen with student emphasis on time management skills. Moreover, having ample amounts of time provides opportunity for students to practice and apply course material (Tinnesz, Ahuna, & Kiener, 2006).

However, should time be the primary learning strategy employed? If students do not know how to study or persist when struggling, ample amounts of time will not increase learning. Paralleling this point, Terry and Doolittle (2008) investigated if increasing students' time management skills would increase their educational self-efficacy or self-regulatory learning. The researchers found students did increase in their time management behaviors but had no significant increases in educational self-efficacy or self-regulatory learning. Although time management skills are important, it seems reasonable to believe additional learning strategies are needed to facilitate deep learning approaches and self-regulatory learning. If keys to deep learning and self-regulatory learning are internal motivation and ability to make adjustments in how one learns, it is feasible to believe allowing students to have more of a voice in their education will produce experiences for this to happen.

Application to a Broader Audience and Areas for Future Research

An important question to be addressed is how this research can be useful to a broader audience. On face value, this research demonstrated the positive effects of capturing student voices and thus increasing student sense of ownership in education (Werder & Otis, 2010). On a practical level, this research should encourage instructors to ask for and consider student input in ways they learn best. Moreover, students should realize they have a say in their education and instructors are approachable and value input to better education.

Following these points, it was clear students were able to determine, develop, and employ numerous learning strategies; and, as a result, they reported a shift in their affect and value for future use. To reproduce these findings, a first step would be to create greater collaboration between students and instructors to facilitate educational conversations. Instead of asking for student feedback only at the end of the semester, instructors should develop procedures to collect feedback throughout the semester. If feedback is only collected at the end of the semester, students rarely discover if their suggestions made a difference. Perusek (2009) employs quality circles as a method to encourage, receive, and implement student feedback. Students involved with quality circles meet with the instructor numerous times throughout the semester to discuss what is going well and students are expected to bring suggestions for ways to improve the class. Quality circles have been shown to increase student and instructor trust and collaboration (Perusek, 2009).

If student perception and type of assessment influence how students approach learning, it only seems logical to include student input in how they will be assessed. This rationale parallels group counseling where individual and group goals are mutually determined in an effort to increase group cohesion (Corey & Corey, 1997). This process can be easily translated to education by creating multiple assignments and allowing students to complete ones that best match their learning style or by co-creating an assignment with students. On a more in depth level, instructors should involve students

in the entire process of course design. However an instructor increases student voice it has potential to empower students to utilize greater deep learning strategies.

Although this research has provided useful and promising findings, it is important to indicate limitations. The majority of the participants were graduate rehabilitation counseling students, and it is unclear how graduate students who had a focused curriculum impacted the findings. In addition, the number of individual interviews was very limited, and it is difficult to discern the impact the interviews had on the overall findings. It would be also interesting to study what students are thinking as they progress towards graduation. It is possible that additional coursework would reveal a more detailed student experience. Further research focusing on what instructors are thinking as they progress through the semester may add to greater collaboration with students and thus increase student learning. Additional investigation of the affective shift students experience could uncover additional learning strategies and avenues to for greater student instructor collaboration. Developing an assessment to measure affective change could be a first step in determining when and how students gain a greater sense of involvement in their learning.

Perhaps the greatest benefit this research provided was capturing student thought and action as they completed coursework. By documenting and disseminating student thinking, pedagogy can be better developed to enhance learning. Most importantly, emphasizing student thinking in SoTL research will lead to increasing students' sense of empowerment and participation in their learning.

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