THE ASSENT TO LEARN: AN EXPLORATION OF ENGINEERING TECHNOLOGY
STUDENTS’ ATTITUDES AND BELIEFS TOWARDS LEARNING IN A
CLASSROOM ENVIRONMENT

A Dissertation
Presented to
The Graduate Faculty of The University of Akron

In Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy

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May, 2015
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ABSTRACT

Learning begins with a decision, especially with adult learners, not as a Pavlovian response to teaching. Intelligence and capability are no guarantee that students will learn. Students decide what and when they will learn and most of these decisions are driven subjectively, not by A.C.T. scores and grade point averages. How are these decisions made and how are they influenced? A learning model was constructed with combined categories of epistemological beliefs, mindsets, adult learning (andragogy), protection of Self and modes of reception, and this learning model was used to structure and compare the opinions, feelings, thoughts, and ideas of 26 engineering technology students via the Q method, more commonly referred to as Q methodology. The Q method combines statistical methods with a focus on the variances between participants and direct semi-structured interviews to compare the opinions, etc., of each participant with every other participant in the group. The subjective opinions of these participants grouped along three main themes: 1) students who are self-directed and develop their own learning strategies, 2) students who are not self-directed and look to the instructor to provide learning strategies, and 3) students who are very sensitive to the instructor’s presentation style and attitudes. The third group of students may make their learning decisions based on how they feel about or react to the instructor’s classroom expression. The learning model proved to be appropriate as proposed. Various areas of epistemological beliefs and
mindsets seemed to be the dominant responses, but protection of Self issues such as face threat (not wanting to appear inadequate in front of others, especially in front of instructors) and personal freedom were prominent.
ACKNOWLEDGMENTS

I thank my dissertation advisor, Dr. Francis Broadway, for his constant challenges. They pushed me far beyond where I would have gone otherwise. I wanted a learning experience and I received one. I also thank my other dissertation committee members, Drs. Xin Liang, Huey-Li Li, Harold Foster, and John Queener for their guidance and patience. I thank Dr. Sandra Spickard Prettyman for altering my views of qualitative research and methods, and Dr. Steve Brown for sharing his vast knowledge of Q methodology with the world. I truly appreciate that Dr. Sue Ramlo recommended this entire journey. On a more personal note, I thank my wife, Betty Arter, for putting up with me during this journey. I received a lot of help and inputs from a lot of people and I thank you all.
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CHAPTER I
MY ATTITUDES, OPINIONS, AND BELIEFS

The pump don’t work
‘Cause the vandals took the handles.

Bob Dylan, 1965

Within the following pages are explorations of subjective views and opinions of students that seem to motivate students’ decisions to learn or not to learn. As with all research these expressions are interpreted through the lens of my subjectivity as a student and as a teacher. How do I interpret the viewpoints and opinions expressed by the student participants of this study? How do I structure this study? Why do I care? If I am to be honest I have to sort through my own learning experiences and ask how they relate to this current effort along the same lines expressed in Pinar’s (1975) method of currere. What are the similarities and differences? What effects will they have on what I deem to be important? What effects will they have on what I think needs to be reported?

The regressive, the first step (Pinar, 1975), depends on memory. Some memories are strong and some are not, but most of all they seem random. As I reflect on my learning experiences I do so randomly. Some will tie to future considerations and some will not. I view this as normal since some memories seem to lead to others. I also reflect the viewpoints that I had at the time of the event, not just my views now. The two may be
different. I take to heart that Pinar (1975) accepts “past,” “present” and “future” as states of consciousness as well as comparative points in time. (“We have found that the future is present in the same sense that the past is present” [Pinar, 1975, p. 9].) Memories can be very real in a current sense. So can dreams of the future. Chronological order means little within our minds and, therefore, I disregard it. I also limit my memories to my own experiences rather than observations of others because my experiences are first hand. There is only one level of subjectivity—mine—to negotiate. All of my primary and middle school teaching experiences were in the inner city, a so called “urban” environment. The population of my high school was half White, half Black, but many of the teaching elements in the middle and high school environments were the same. It is true that the teachers in the “urban” environment were more supportive of us as Black students, especially in middle school (it was called junior high at that time).

**The Regressive**

When I first started school I was excited. It was my first step towards being a “big boy.” The activities made little sense, but my parents told me I would learn things I needed to know. It was going to be “fun.” Everyone had to go anyway. I sat in circles and played with blocks and sang songs that had no meaning to me. And no one asked me what any of this meant.

Sometimes when watching television I have seen children (the characters) complain that adults never listen to children. When I was about five years old the living room couch caught on fire from a lit cigarette. (Both of my parents were smokers.) I saw
the fire start and went into to kitchen to tell my parents who were entertaining two friends. At the time the general rule was that children never interrupt adult conversations. However, they did listen, but dismissed what I said, or what I tried to say. They continued to talk and smoke and laugh and the couch continued to burn. It wasn’t until they all smelled smoke that everyone ran in, recognized the problem, put the fire out and finally realized what I was trying to say. Even when the living room couch is on fire, what do “kids” know?

Fast forward. I am 12. My father was doing one of his “do it yourself” projects. It included sawing a piece of wood to length. He laid the wood on a table and sawed away. Suddenly his sawing became more difficult. After some brief deliberation and discussion I suggested that maybe he was sawing through the table. Without looking, nope, that’s not it. After another two or three inches he did look. Behold! There was a nice three-inch line sawed diagonally into the table. His only comment? “I guess you were right.” Nobody listens to children. In kindergarten I complained that another student was cursing. I was told to shut up and go back to my place. (My first lesson in the killing of the messenger.) In eighth grade our social studies teacher tried to tell us that no Black men served in World War I. That was hard to do since my grandfather had a photograph of his WW I battalion (of course, he was in the picture) mounted prominently on his living room wall. A few other students had similar evidence. This was one argument the teacher could not win. He gave up, but he never listened.

Children generally live in a world in which adults do not listen to them. (Later we grow up and learn that adults do not listen well to each other either.) If we do not listen to
children or adult students, how can we as teachers possibly know what their learning interests are? If students are not doing well in a class is it a lack of talent, “problems at home,” or a lack of interest?

No one in school seemed to be willing or able to explain anything of interest, at least of interest to me. Why are we standing here reciting a pledge of allegiance to the flag? Why a flag? What does this pledge mean? What is a republic? What is a president and why is he important? Why are we here? Playing at home is a lot more pleasant. Later: What was the history of Africa before slavery and colonialism? Why is communism “bad”? What is communism? (I did get a logical discussion of that question in my 11th grade history class. I credit the teacher, not the system. He was one of my few memorable teachers. His argument was that if you are going to be against something you should thoroughly understand what you are against. Information trumps dogma and fear.) How was one small man with a square mustache able to lead a whole nation to destruction and take a large portion of the world with him? (Everyone seemed to talk about World War II long after it was over.)

Why do people go to church? Why do people think of it as special, even necessary? How do you know that there is a God? By the way, just what is God? To my parents’ credit I lived in one of the few households in the neighborhood that allowed these questions to be asked without being slapped. Also to my parents’ credit they did not always give me definitive answers. Sometimes they sent me on a quest to the local library. Sometimes they admitted that they just did not know and that sometimes I would
have to find my own answers in life. Those were my first positive learning experiences. I guess that sometimes my parents did listen.

I was in school because we were all supposed to be in school. It seemed to be something all children were doing; my parents asked me (told me) to do it, and there seemed to be no way out of it that did not seem to be very costly to me as a person. During my K-12 learning experiences my parents and some teachers stressed how learning would help me later. Typically, I stuck with playing school to avoid any undue grief. Get it done, keep my grades reasonably high, and move on. Fortunately, I was “smart” enough to slip through and look studious while doing it. I am grateful for the reading, the writing, the “arithmetic” (in a general sense “arithmetic” includes higher mathematics, or “math” for me), and the science (for me, physics). You can keep the pointless activities, the straight lines that we always had to sit and stand in (kind of like the military or prison), the biased, blatantly racist history, and the persistent brainwashing—the constant push to make us what we “should be” instead of enhancing what we were (and are). I can count the number of K-12 teachers that openly tried to teach us to think. And I only need one hand. If I include the “okay” teachers, the teachers that simply did a good job of teaching us without including their personal baggage, I need two hands.

As Lewis Black, a comedian said in one of his routines (nothing pertaining to education), “Something is askew.” (I do not have a reference for this. I saw, I heard, I laughed and I remembered.) Something about the K-12 education I encountered just did not seem “right.” In my mind this was solidified during my experiences in the fifth grade.
Nothing my fifth grade teacher said made sense in terms of my daily life. Her general attitude was we should do things because we are told to. We (she and I) battled all semester. It became personal. If my parents at least try to reason with me, why should not you? Why should I believe you? Why should I trust you? In the fifth grade I did not have these words, but I definitely had these thoughts! (Just because we cannot verbalize our thoughts does not mean we are not thinking them.) This was the first experience in which my personal attitude toward a teacher affected my willingness to learn. I did not trust her as a source of information.

It was also during the fifth grade that I had my first experience with “drill and kill” rote memorization with another teacher, my math teacher. (At that time in elementary school, or in primary school one teacher taught all subjects in one room, except for math because “math is hard.” This is another message that many teachers still implant in young minds.) The teacher’s game plan was simple. She divided the class into three groups. She introduced the topic on the first day of the week. She taught one group a day around a large table while the other two groups memorized multiplication tables (a lot of rote memorization) and worked out multiplication and long division problems. Then she summarized and reviewed on the last day of the week. This was one of the most boring classes I have ever taken and it has left me with a distaste for arithmetic that persists to this moment. When I see arithmetic, I almost shut down. In my eyes one of the most wonderful inventions the world has ever seen is the calculator. I always keep one handy and nearby. I have a calculator on my Android phone. Can I do longhand arithmetic? Yes. Will I do longhand arithmetic? Not if I can help it. The second most
wonderful invention in the world is the spreadsheet for the same reason. It reduces the need to do arithmetic.

This is the same math teacher that used to require that students write “I will obey” 1,000 times as a punishment. (I am not exaggerating. I mean 1,000 times.) Many students actually wrote “I will obey” ahead of time so that they could screw up later and have the punishment assignment already done. What did this say to us as students? What did this have to do with learning? Is obeying that much more important than learning? Again, my head was filled with a jumble of thoughts, but nothing I could clearly identify or express at that time. I simply began to view education as something of little personal value, as something we all just did as our parents had done so that when we grew up we could get jobs. And it was not evident how school and jobs had anything to do with each other. All I knew was that the adults in my life kept emphasizing the point that I needed to do the former to acquire the latter.

In seventh grade I received a wakeup call. My math teacher (by then we were taught by topic, not all students in one big room all day with one teacher) pulled about six to eight of us aside and asked to visit our homes, which was a rather unusual request at the time (usually this was not a good sign). She told my parents that I was very good at math and rather than allow my talent to go to waste would they mind if she accelerated my math education.

My parents said, “yes” without hesitation. (Both of my parents believed in education. My mother was valedictorian of her high school class. I never had to ask twice for anything related to education.) The math teacher started a math club. The beauty of
this club is that we were allowed to learn algebra in the seventh grade instead of the ninth when it was scheduled. We took to algebra like proverbial ducks take to water. We could not get enough. There was nothing boring here. We used to finish our homework early so we could have enough time to work on our algebra problems. Algebra made perfect sense—a lot more sense than the English or social studies or the art classes I was taking. We had to figure things out rather than just remember them. We began to learn to process information. When we entered the ninth grade, the grade when algebra was normally introduced, we served as tutors for the other students (we still had to take algebra at the appointed time) and had moved on to trigonometry. (At that time junior high, or middle school, contained grades seven through nine.)

This was a turning point for me for many reasons. I was actually asked to learn something of interest. I was “allowed” to learn. How many other wonderful things could we, my classmates and I, have been “allowed” to learn if we had been allowed to follow our interest and our talents instead of being “shaped” and “molded” to become “productive” adults? Now my thought that “something is askew” began to solidify. I was as motivated by algebra as much as I was demotivated by arithmetic. Was it because of how each topic was approached by that teacher? This motivation has served my interest in engineering well. It also provided a glimpse into my personal talents, which I had never, ever considered before. I began to ask, why did I not see this talent myself? What else can I do? It made me wonder why education was on a timeline instead of a talent line. Why were not students introduced to all topics, not just algebra, as they demonstrated an ability to address these topics instead of at a predetermined time? Why
should I have to wait until ninth grade if I can clearly understand algebra in the seventh grade? Also, how did this teacher recognize our talents when it seems that no other teacher did, or at least chose not to act on recognition? What had we done as students? To me this represented a stark difference between education as it could have been and education as it was. It also forced me to think about how I learned and about my attitudes towards learning. Learning was much easier when my interest was high and when I wanted to know. (This teacher went on to earn a Ph.D. in education and eventually became the director of the educational research department of the Cleveland Public Schools. The members of her math club went on to college and currently work in various professional careers. One of the club members lived the first 10 years of her life after high school in the dumps, then went to college, earned a law degree, and now teaches at a college in Boston—a truly interesting assent-to-learn story.)

The first “ah-ha” moment I can remember, or more correctly that I never forgot, occurred in the first grade (I was six). Our teacher sat us all in a small circle and we read out loud after a few days of lessons and practice. This time we were divided into four groups. One was a reading group while the other three groups practiced individually. I was always a mediocre reader at best. I never really cared. It was simply another task assigned by “grownups” for no apparent reason, and everyone was doing it, so why not? One day I decided to read well. Translation: I read with what the teacher called “expression.” I became the class example for about a week. Then I returned to “normal.” The reason this experience has stuck with me all of these years is because I do not have a clue why I did what I did. I don’t know what happened. Why did I suddenly “understand”
what was required of me? Why did I care? Was it just a performance? And if so, why did I feel the need to perform? However it all happened, the one thing I became aware of is that I had the ability to at least act as if I was “smart.” Sometimes children simply do not see the connection between what they are asked to do and any meaningful purpose in their lives. Even after many trips to the library it never dawned on me that those trips were possible because I had learned to read. Sometimes students do not make the connections they seek even when the connections are obvious.

In high school I met a girl who was not only attractive and “smart” (after all, it was an accelerated program—they gave us more engaging material to learn instead of allowing us to skip grade levels), but she was also very outspoken, kind of offbeat, and downright interesting. We hit it off immediately. We used to talk a lot about social issues (my entire K-12 experience was before 1968, before Blacks had moved from the back of the bus) and she was always telling me about these books she was reading such as James Baldwin’s Go Tell It on the Mountain and Giovanni’s Room, Malcolm Boyd’s Are You Running With Me, Jesus?, and poems by Nikki Giovanni (now Dr. Giovanni, distinguished professor at Virginia Tech). Her “reading list” was a lot more interesting than the poetry and literature being taught in class, and reading and discussing her reading list strengthened our personal relationship. I saw no downside other than poor English grades and I really did not care about that. In addition many of my friends were reading “alternative” books as well as “Mohammed Speaks,” the newspaper of the “Black Muslim Nation.”
I wander. My first Black history lesson was given to me by my eighth grade social studies teacher, an Italian woman, as a class assignment. We had to go to the library to find at least five prominent Negro men or women (we weren’t Black yet) who contributed to American society. I was shocked at how easy it was to find the information at the local library and at how many prominent Negro people there were. This turned out to be an exercise in racial pride, and I do not doubt that was the intent of the assignment. I found it ironic, and still do, that a White person provided my first formal Black history lesson. It also bothered me that the information was in the library all along, but no one in my community had pointed it out to me.

I return. Life became complicated as I became more self-aware as a Black person and began to realize the extent to which Blacks were culturally neglected and marginalized. In school we were bombarded with Eurocentric culture always presented as “normal.” Nothing described to me struck me as normal. What did “normal” have in common with the life of a poor Black kid from the east side of Cleveland? Nothing! In no way did it compare to the life I was living. And I couldn’t find a teacher in the school building, White or Black, who would agree with me or even recognize my point of view. (Actually I found two in middle school, but the discussions were never extensive.) My parents understood but suggested that I just go along and move on. Unfortunately, I was entering my rebellious stage. This time I did not play school. This was my first experience with learning what I wanted to learn instead of what I was told to learn, i.e., self-directed learning on an intellectual level. (I define “self-directed” as learning what we want, not independently studying what we are told to learn.) Later I learned that there
are always things that we have to do that we do not want to do so that we can successfully accomplish the things that we do want to do. We have to play scales before we can play songs. This is when I began to pay more attention to what I was learning and the impact it was having on me, and I became more active about selecting what I chose to learn. It was also when I began to deliberately perfect my hoop-jumping skills (passing without learning), or what Kohl (1994) calls “not-learning.” I “not-learned” selectively. I began to take charge of my learning instead of just floating along. Taking charge did not happen all at once, but this was the beginning of a slow development.

In my senior high school year, my English classes covered 19th century English literature. This was not a problem until books such as Little Women and Wuthering Heights were introduced as well as the poetry of that 19th century era. My overall response was, “Why do I have to learn this? What does any of this have to do with me or the life I live today?” I was told that immersing myself into 19th century English literature was intended to “enrich” me and make me “well rounded” as a person. I asked, “Well rounded for what, and who defines well rounded?” I could not see a connection between this body of work and my daily life. More pressure was applied such as notes sent home to my parents and threats of more low grades (Ds and Fs), but I refused to comply and to take the material seriously, or even to read the texts. I withheld my assent to learn even though I knew that withholding would result in poor grades in English. In the meantime my other grades remained high.

Later I asked in open class, “Why are we studying a period of time and literature that has no relation to the times we live in, especially for me as a Black person?” I never
received an answer. In my opinion, be it correct or incorrect, it was an attempt to reinforce Eurocentric enculturation on the student body irrespective of the ethnicity or culture of the individual students. It was “one size fits all.” The English teacher said as much when she constantly went on and on, day after day about how English literature and culture was superior to all others. I felt I was defending myself against enculturation and domination. I felt I was demonstrating that students have a choice even if they had to pay a price for it. Again, I was in a rebellious stage. I graduated with Ds in English (my letter grade) during my senior year, A’s in everything else (my GPA was ranked 34th of a graduating class of 497), went on to college, and eventually did well, but I lost all interest in literature in general.

However, I had bought the Iliad and the Odyssey around the same time but never got around to reading them. I found Greek mythology interesting, but by then I was done with literature in general. If I could have substituted these books for the English literature I was given, I would have done much better, which is ironic since Greek mythology had no more to do with my life at that time than English literature. Fortunately, English literature was never a requirement for engineering other than to graduate. As an engineer I have never been asked to reflect on anything having to do with English literature.

My first direct contact with overt racism was in wood shop in the fifth grade when the White shop teacher told me that I could not make an item I wanted to make because he had tried it with (White) students a lot smarter than me and they had failed. (Although my elementary school was predominately Black, there were a few White students, and this teacher was “friends” with all of them.) I was far more annoyed with the “smarter
than you” comment than I was about the White-Black dynamic, which I did not fully understand at the time. How could this idiot know how smart I was without allowing me to demonstrate what I could and could not do? (Woodcarving and woodworking were two of my hobbies. We had hobbies back then.) Although the racism was clear, the even bigger issue for me was making assumptions about students that were not true and/or had not been substantiated. To me this is a major damage done by racism: denying a person’s right to grow based on false assumptions.

My first remembered exposure to covert racism revolved around the math club I mentioned above. A new White student joined our school. (This was really unusual. He was from central Europe. As soon as his parents caught on to the White-Black thing and could move, he was gone.) Another math teacher (White), the department chair, suggested that the White student be allowed to join the club and he did. It was obvious that this student had no outstanding math skills. The message was obvious: If Black kids can do it, surely a White kid can. (Even the teacher that started the club commented on this.) This was not only an exposure to racism; it was my first exposure to White privilege. Without any justification a White teacher inserted a White student into a place where that student clearly did not belong. Why did he feel he had the right to do that? (He was the math department chair, so maybe that was it.) Why did the teacher who started the club feel the necessity to allow this student to join? (Again, this is pre-1968.) Whites obviously had privileges and took privileges that Blacks didn’t have or take. The assumption of privilege continues today.
Learning is highly subjective. I have to admit that many of my K-12 teachers provided learning opportunities that I chose not to accept. It is unfair to blame my teachers for all of my learning failures. However, the questions remain. If the teaching and learning processes are highly subjective, why is not more effort devoted to understanding students’ attitudes and viewpoints on that which is deemed important to learn, to the teachers’ attitude and viewpoints of what is important and why? It was not so much my teachers’ opinions that bothered me, it was their inability or their unwillingness to explain why in terms we could or would grasp. They never seemed to “level” with us. I always felt that I was being handed another Santa Claus, Easter Bunny, Tooth Fairy tale. By fifth grade—that is when I really started asking questions even though I was not able to verbalize or understand them all—both my friends and I knew that our parents played the role of Santa Claus. We were past the point of being lied to because we were “too young” to handle the truth, due in part to our inner city “educations,” or what some call the development of “street smarts.” In short, after seeing what adults really do, the cleaned-up-for-children version just did not ring true. Children are very observant. At least we were. Lying does not engender trust.

By the time I started junior high very few children in my neighborhood or school thought that we lived in a perfect world even though we did not always understand the context. In poor neighborhoods people make money any way they can, legal and illegal. Most people worked (at that time most Blacks could only get low-paying jobs), but there were always gambling and gambling establishments, drinking establishments that operated long after the bars closed, things that fell off of trucks, and a hundred other
“hustles.” Everyone minded his or her own business. We had to survive. That was the origin of “not snitching,” not the license to shoot up the neighborhood that gang-bangers claim today. There was occasional violence. We saw the police occasionally haul someone away. We knew that law-breakers went to places for “bad” people. We knew the names of those places. We knew that men and women did not always sleep with their spouses. We knew that some men liked men, and that some women liked women. We knew that some adults used “dope.” We knew all the neighborhood drunks, sometimes by name. (We used to call them wine heads or winos.) We knew that some women sold sex. If two dogs were screwing in the middle of the street, no one broke them up, unless the owner of the female dog showed up. In this type of environment Easter Bunny, Santa Claus, Tooth Fairy tales were just plain laughable. Most of my teachers never seemed to understand this, and my parents, for reasons I still do not understand, felt obligated to play along. That forced us as inner city students to live in two worlds: the real world we saw and experienced every day, and the fake world our teachers kept telling us about. Our favorite teachers were the ones who reflected our real world.

Moving forward. My first two and a half years of college were a disaster. At the age of 18 years I did not have a clue what I wanted to do, what I expected to accomplish in college, or what career I would pursue. The three years after 18 were muddled confusion, both educationally and personally. So, I partied in typical late 1960s fashion. I skipped classes and tests, did not do homework, and just generally did not care. On the other hand, I attended all the social events I could squeeze into any 24-hour period. I hit
the bars (the ones I could sneak into), the pool halls, and the local hangouts on a daily basis. I almost flunked out of school. And this time I had no one to blame but myself.

My biggest problem was making the transition from high school and a high school mentality to college and a college mentality. In high school there was a support structure. Teachers and parents teamed up and made sure that homework was done and that we were in class. The school system had truant officers to round us up if we cut school and herd us back into school. We were monitored. In college there was no monitoring. We were given assignments and class times. If we showed up and performed, all was well, and if we did not that was just too bad. This was my first experience with complete independent self-direction and self-policing and I was a dismal failure at both. It never dawned on me that I was supposed to do these things and my failure to do so proved to be a major barrier to my college success. Today I pass a warning to all new students who will listen. You are on your own whether you realize it or not. No one is going to check on you or push you. You will have to make it all happen. You will actually have to act like an adult and take full responsibility for yourself. (I am first in my generation to attend college. My family did not know about the transition from high school to college.) I never press 18-year olds about their goals. At 18 very few students have a clue as to what they want to do and should not be forced to make life decisions without leaving plenty of room for change.

During my undergraduate experience I participated in the university’s co-op program. The university found job opportunities within our areas of study. We would work at local companies and then write a report about our work experiences. At that time
a 40-hour summer job with the average company allowed us to make enough money to pay for a year of college expenses. (We referred to these as “real” jobs.) Afterward we had to write a report focusing on what we had learned. Looking back it amazes me that I never answered that question and neither did most of my fellow co-op students. I described my work experiences, I provided a time line, and I included samples of my work (I was a draftsman), etc., but not once did I write, “I learned…” And, no one ever brought that to my attention. I often wonder if anyone ever read those reports. The point is that learning was implied, but rarely clearly defined by the student or the teacher. Exactly what is meant by learning? What has occurred when we learn, and how is it measured? For example, do positive test results demonstrate that learning has occurred? I argue that tests, depending on how they are structured, may only demonstrate that passing has occurred. I have passed many tests without any sense of learning.

This experience of “passing” added to my feelings of the uselessness, or at least the ambiguity of school. What was it all for? As I was stumbling through YouTube videos recently, I hit upon a page in which students talked about (actually they “rapped” about) the delineations between school and education, and between learning and passing. For them education and learning are heartfelt and serve as aids in successfully negotiating our way through the world we live in. This opinion is in complete lockstep with how I felt during my K-12 and early college experiences. I still feel that way.

After over a little more than two years I left college with a 1.87/4.00 grade point average, joined the military, and spent a little over three years vegetating and growing up. The military was definitely not for me, but I ducked Viet Nam. I could never get with the
program. I eventually not-learned my way through it as an administrative clerk and happily returned to civilian life. Too much regimentation, too many rules without reason, and too much uniformity. However, this period of military service was not without its lessons. This was my first direct experience with bureaucracy, an especially large bureaucracy. It was my first experience with rules that governed everything, forms that recorded everything, a runaway machine of directives and oversights. We tested for everything, including new positions, promotions, etc. We were told when to awake, when to sleep, what to do on the job and how to do it. It was all so thoughtless. Just do it and do like you were told. I quickly developed my non-learning skills (Kohl, 1994). I learned enough to meet the immediate goals, and I tuned out the rest. I learned to keep my head down and to stay “below the radar” as opposed to rebellion. It was also very educational in that corporate America follows the same model to a lesser degree. My military experience made it easier to play “good employee” when I returned to the workforce. The big difference between the military and corporate America is that corporate America does not actually throw people in jail if they decide not to show up at work on any given day.

At the time of my inglorious exit from the military the job market was in a slump, so I returned to college—the same college and the same program, mechanical engineering. Thankfully, they let me return. At first I faltered a little and I had to relearn and review, but not as much as I expected. I attended all classes, took all tests, and completed all homework assignments. I was amazed at how simple it was. I simply did what any student was supposed to do and I was on the Dean’s list. There was a difference in me, but there was also a difference in the subject matter. After I made up for a failed
chemistry lab and finished my last humanities “elective”—if I have to take a course to graduate then it does not become an “elective” just because I get to select it—all of my remaining courses were engineering courses, which was why I was in college in the first place. Again, who were these people who felt free to decide what would make me “well rounded” by forcing me to take unrelated courses? College was much easier for me the second time because I had “grown up” and because I could focus on my interests.

From that point forward most of my college experiences became routine with the exception of three professors. At the time mechanical engineers were destined to “work on the board,” the drafting board as designers or as test engineers. In other words, mechanical engineering was very static. Changes with respect to time (transients) and dynamics were rarely considered. That changed. The first professor I remember extending beyond this static view was an expert in elastic foundations. The overall concept was that a machine is not an isolated entity. It rests on something and the elasticity of that “something” has to be included to conduct a correct deflection analysis of the machine. This was significant to me because this approach was global instead of local. This professor took us “outside of the box.” It brought me face to face with how limited I was as a potential engineer.

The second professor who expanded my horizons was a new hire and expert in automatic controls. This was the first course in which I actually used differential equations, which was very uncharacteristic for mechanical engineers at the time. Electrical engineers always used differential equations, but not mechanical engineers. It was like looking at the world of engineering in black and white and then suddenly having
everything turn to vivid color. With this approach we could evaluate transient as well at static conditions. We could also apply many of the equations to a range of different problems rather than to only one isolated case. About this same time computers became more accessible to students.

Computers deserve a full discussion because they changed the way engineers were able to analyze problems and that in turn changed my attitude toward engineering and my willingness to truly learn engineering. Many universities, and mine was no exception, bought IBM “main frame” computers (IBM stands for International Business Machines—money making comes first, then we worry about science) that were initially accessed by programming cards (punch cards), and then shortly thereafter by “dumb” monochrome terminals. Access to computer power changed engineering because problems that were unsolvable before could be modeled with discrete approximations that provided very accurate solutions, and more importantly very usable solutions. A study partner and I took a numerical methods course to learn the effective ways to develop these approximations, and that allowed us to tackle just about any problem we wanted. The combination of computer power and numerical methods applied to dynamic systems has proven to be a very powerful solution method and has been the bedrock of my engineering career over the years. This is when I believe I really began to become a “complete” learner. I began to appreciate the whole picture, not just my small part of it.

(A side note: My study partner was always more grounded than I and seemed to be more in tune with engineering as a whole. The numerical methods course was his suggestion. Once again my association with another student had proven to lead to
wonderful learning experiences. My study partner went on to acquire a Ph.D. in engineering at local university where he now teaches engineering as a full professor.

The third professor, much like the first, provided an example that shed light on my limited thinking. (I fight daily with the limitations of my thinking. Talking and working with others, which I am not prone to do, is usually very helpful.) There was only one automatic controls course in the mechanical engineering department, but there were several in the electrical engineering department so I took a few of these courses, both as an undergraduate and as a graduate student. This was allowed. During one of the lectures near the weekend (we used to meet four times a week for one hour) my professor presented material from his dissertation. He showed how the same first order differential equations used in engineering could be used to model economic processes. I do not remember the details, but I do remember dropping another limitation. There seemed to be an overriding “oneness” to existence. The application of any idea or concept is completely dependent on who does the looking and on what he or she sees. We create divisions that are not always there. I am sure this sounds more philosophical than technical, but that is my point. Before we draw the conclusion that the two, engineering and philosophy, are separate we need to ask if that division is intrinsic or subjectively assigned. Should life be modeled as one huge Venn diagram instead of compartmentalized lists? These latter experiences inspired me throughout engineering graduate school.

After working over a decade in industry I went to business school. Why? I simply got tired of sitting in general meetings with everyone in the room seeming to know what
was going on except for me. I was an engineer’s engineer and had spent little time learning anything outside of the field, including anything about business. I thought that working as part of a business without knowing anything about business was not a good idea. So I went to business school to learn and to earn an MBA in the process. I set some rules for myself. Rule one: to hell with grades. Rule two: focus on learning everything I can. Of course I wanted to pass, but not at the expense of learning.

I did well grade-wise and learned. Those rules only failed twice. I had a poor accounting professor. He could never tell us why he did what he did. All he would say is that you “have to know your accounts.” What does that mean? Later at a new job at another company I worked with a fellow graduate who had taken the accounting course with me (I did not know her at that time). She was very good at what she did, and later she commented that she had received a C in accounting just like I had and that this professor was not asked to come back (he was part time). It felt good to know that the problem was not all me. The second failure occurred in a marketing class. I disagreed with the professor. He claimed that customer satisfaction was the purpose of a company. I claimed that making money is the purpose of any business and that customer satisfaction was the best way to make money. I of course was “wrong” and I received Cs for the rest of the semester. I had been down this road before. I took my C, offered no conciliation and moved on to graduation.

It was a wonderful, enriching experience and most of all I did not have to sit through any more business meetings with a complete lack of understanding about whatever was occurring. Because of rules one and two I felt no pressure to be a “star
pupil.” I gained an appreciation for how the pieces of a business come together and I understood many of the “crazy” decisions that I had seen. Learning about business made me less judgmental.

There are some basic things I have to admit about myself. I have to confess that I am not a “deep thinker.” Life “is what it is” and I have always been far more interested in how things work than why they work or should they work. I have always been amazed how often I have found the “whys” when pursuing the “how’s,” so I never worry about it.

Most of the enjoyment I experienced during my K-12 years was primarily for one reason: social activity before, during and after school. School was where my friends were, especially the ones that did not live in my immediate neighborhood. When I entered junior high school I began to really notice girls. My primary focuses from junior high through high school and early college were girls and my social life, not education. Helping girls with their math homework really paid off. In junior high I spent the rest of my time playing street ball (basketball on the open neighborhood basketball courts—asphalt, no nets) or swimming at the local city recreation center. In high school I spent most of my free time “running the streets,” i.e., hanging out and having fun.

I played sports (I was never that good). Sports are supposed to be games and games are supposed to be fun. Coaches never treat them that way. Coaches are way too serious. I just cannot take losing a game seriously. That’s a second thing I have to confess: I have a hard time taking most things “seriously.” (Define “serious.”) Solving problems is good enough for me. Pining over them seems useless. Address the problem then unless it is life or death, move on. Life is too short to be too serious. “Life is a
tragedy for those who feel, and a comedy for those who think.¹ I laugh a lot, though as stated above, I do not consider myself to be a “deep thinker.” The ironies of life amaze me. One of my uncles used to always say, “Well, it is, but isn’t.” I think I know what he meant.

I confess that I am not a “quick” thinker. I absorb new information slowly. I have to sleep on it. I have never understood why doing something fast was always considered to be advantageous over doing it correctly, especially when many deadlines are artificially or arbitrarily imposed.

Reflection and Summary

Before moving on to the progressive step, the second step of the currere process, I think reflection and summary are in order. These recollections affect how I teach and learn today. They impact what I consider to be important when teaching and learning. Within these spotty recollections what are the common threads and themes?

- Honesty and openness - It was more difficult for me to learn from sources I did not trust, or that I felt lacked open honesty. I felt that we as students should have been allowed to determine for ourselves if the information being given was too much to handle, especially since we knew much of what our teachers attempted to hide from us.

¹ As quoted in Selected Thoughts from the French: XV Century-XX Century, with English Translations (1913), pp. 132-133, by James Raymond Solly. This may conceivably be a misattribution, because as yet no definite citation of a specific work by La Bruyère has been located, and the statement is very similar to one known to have been made by Horace Walpole in a letter of 31 December 1769: “The world is a comedy to those that think; a tragedy to those that feel.”
• Listening - It was more difficult to learn from teachers who never seemed to listen. Whenever I was accused of not listening, I thought “so what”? Nobody seems to listen.

• Usefulness - I always focused on information I thought was useful to me. Other students seemed to do the same.

• Meaning and relevance - It was more difficult to learn when the topic and the intended results had no personal meaning or impact. “Because I said so” just did not work. Engagement and participation always helped.

• Subjectivity - There is no “purely objective.” Learning is subjective and my decision(s) to learn or to not-learn shifted and morphed constantly for reasons known and unknown to me as a student. Our personal opinions, attitudes, and life views, and those of our teachers were embedded in everything we said and did.

• Teachers’ should keep their personal “baggage” to themselves as much as possible.

• Socializing among students - Students influenced each other heavily. More than once I felt that I learned more from other students, or as a result of my relationship with other students, than I have learned from teachers even though teachers initiated the activity.

• The world we live in - Cultural influences were always present during my education, but more as a backdrop, as something ever present, but rarely overt. Racism was (is) always present, but there was never a local Klan rally in our
neighborhood or at our school. (There were plenty in the South.) Sexism was (is) always present, but girls were never told what they could not do. They were simply told over and over what “good girls” should do. Sexual preference was simply not discussed. Ever. It was implied that no one would ever do anything that was not “normal.” Everyone was assumed to be Christian though there were Jews and Muslims around my neighborhood. The effects of cultural differences on my learning are difficult to assess.

- Shared “blame” - It was not all the teachers’ fault. Many times I was my worst enemy. To some degree fault implies intention or negligence. I do not believe that most of my teachers deliberately and callously made teaching mistakes. It was more likely that they were well meaning agents of a faulty system with which we all wrestled.

- Underlying this discussion is, again, the matter of trust. Do students trust teachers to teach useful things and do teachers trust students to put forth at least a marginal effort to learn?

My life experiences have had a heavy influence on my development of the assent-to-learn model I present later. It is gratifying to know that other students have had similar learning experiences of which many teachers are aware, and that they consider and address these experiences as best they can as they teach. My belief and the basis of this effort is that openly considering and including both student and teacher subjectivity can assist in the development of a more comprehensive understanding of the teaching-
learning process. We have to consider each other as feeling people, not as programmed automatons.

**The Progressive**

The progressive stage of *currere* focuses on the future (Pinar, 1975). Where do you think teaching and learning are going, and where would you like it to go? During the progressive stage I look forward in association with the contexts of today. Primarily I see an opportunity to investigate and study learning in real time with real people. To do otherwise would be to draw conclusions about learning from only my own experiences and my evaluation of teaching and learning literature producing a single datum. A study allows a group of individuals to use each other as mirrors in a synergistic process that, hopefully, will provide a deeper understanding for all, both at a personal and general level. The intent of this study was that not only will I walk away with a deeper understanding of the assent to learn, but so will the participants in the study. When we know how we learn, we can direct ourselves more effectively toward environments and situations conducive to learning. As an instructor I expect to acquire a better understanding of the assent to learn and to use that enhanced understanding to improve my teaching methods.

**The Analytical**

The analytical third stage of *currere* allows a person to compare the past, the regressive, to the future, the progressive, and to ask, “What is left” (Pinar, 1975, p. 11)?
One should describe the present “exclusive of the past and future, but inclusive of responses to them” (Pinar, 1975, p. 11). I currently teach mechanical engineering technology at a Midwestern university within a community and technical college. The “community” and “technical” are somewhat different. On the technical side we teach students who will typically go forth after graduation and work as machine designers, manufacturing and maintenance operators and technicians, and in some instances will work as engineers. (In industry, especially in manufacturing and with smaller companies, the line between engineering and engineering technology is blurred.) Through our programs we offer associate of applied science and bachelor degrees, and most of our programs are ABET accredited. (ABET used to be the Accreditation Board for Engineering and Technology, Inc. Now the organization simply and legally uses ABET as its name. A different branch of ABET accredits engineering programs.)

I have many personal and professional interests. Sometimes my interests are both. I still enhance and expand my knowledge of engineering and science. I teach an economics of technology course that requires my knowledge of business, and for the past eight-plus years I have been studying education. I like computers, including computer games, and reading and television, including science and science fiction, mysteries, comedy (comedians are modern day troubadours—they openly mirror society’s inconvenient truths and taboos) and whatever catches my interest at the time. I like history (if we know history we will not repeat it), but I am very skeptical. History depends on who tells the story. (I think history has more value in an allegorical sense.) I am not a sports fan. I like various forms of painting and sculpture. I find Jerry Springer,
Maury Povich, and Judge Judy totally entertaining, as much as I find a PBS Nova presentation on deep space totally intriguing. I listen to country (the last generation), bluegrass, rap, blues, R&B, jazz (especially “Bebop”), classical, “hard” rock, and anything else that catches my fancy at the time. (Rap and hard rock are our children’s effort to express their views of their world. If we do not like what they are saying or the way they say it, maybe we should investigate our contributions to how they are living and feeling. Nobody listens.)

Most of my students are White males and from rural and outer suburban communities. When they initially encounter me, a Black instructor, they are somewhat shocked, but most move past it quickly. As one person, a professor at my university, put it, I become part of the furniture, part of the landscape. Over time I become incorporated into the students’ “normal.” This is why I do not emphasize race although it is ever present. I do not include it as a category or a concern in this study because I do not want the focus of this study to be sidetracked with the “excuses” of racism. The focus is on engineering technology. Either the students express an understanding or they do not. If they earn a letter grade, they receive that letter grade. Students do not seem to view race as part of the equation. Students are far more likely to complain about my personality or my teaching methods than my race, although it could be argued that they complain about one in lieu of the other. So far I have not experienced any overt statements of race made either to me or to my colleagues, except for the one student that compared me to the (Black) cook on South Park, a television cartoon show. No one picked it up or paid it any attention.
Most of the students in the engineering technology program like technology and have technical hobbies that involve working on automobiles, motorcycles, boats, and mechanical devices and systems. Most enter the mechanical engineering technology (MET) program with solid “hands on” experience. They do not like higher math, physics, and excessive analysis. They are not theorists. Although I am an engineer and have studied and worked in a more theoretical sense, I feel a bond with many of these students. I do not like studying things without purpose and relevancy, and I try to bring purpose and relevancy into the classroom. In many ways we are in the same boat.

Sometimes it amazes me that although we are different, my students and I, we share many common attitudes towards learning. I look at the students in my classroom and in the college and I see them struggling with many of the same learning issues, questions and concerns that I have been struggling with for years although our backgrounds are different. I see the same attitudes and issues among the younger members of my family. Sometimes I feel that I am looking into a mirror. What excuse can I possibly have for not investigating these learning issues, questions and concerns, and hopefully gaining insights that can help us all? I have the method and the means. That means I have no excuse.

The Synthetical

The synthetical stage, the fourth and final stage of currere requires that the individual “look at oneself, as if in a mirror” (Pinar, 1975, p. 12). “In your own voice, what is the meaning of the present” (Pinar, 1975, p. 12)? Can I synthesize my current
understanding of the regressive, the progressive, and the analytical? Yes, but incompletely because I am only using my experiences. If I can incorporate the learning experiences of others, my synthesis will be wider in scope. My interest in the assent to learn is largely driven by the similarities I see in my learning experiences and those of others. Therefore I postpone the synthetical evaluation until I can include input from students.
CHAPTER II
INTRODUCTION

Man is not a rational animal; he is a rationalizing animal.

Heinlein (1955), p. 33

Chuck and Bob were very angry. They were young adults and students in a technical college, and although their cases were similar they had not met before they became students in the college. They were disruptive in class, barely did homework, performed poorly on tests, and encouraged others to do likewise. They adopted the slogan “D is for degree” (“D” denotes a grade). They planned to do the bare minimum to graduate with a bachelor’s degree in engineering technology. Rumors were that they both were given an ultimatum by their parents who own and run the family businesses: Get a four-year college degree in anything you want or you won’t inherit the business.

Just as there were similarities, there were also differences. Chuck normally got along with his parents, but Bob did not. Chuck wanted to work in the family business, but Bob planned to never work in the family business, especially if it meant working for his father. Even after their disruptive behaviors were addressed and abated, they both settled down to an academic life of mediocrity and were proud of it. Disagreements with professors were common. They clearly withheld their assent to learn.

And so it went until their senior year. Suddenly they changed. Their homework improved, both in frequency and quality and their test grades improved, even when criticized by the very students that initially emulated them. Their project reports became well written and comprehensive. Chuck gave an oral presentation about the family business that was one of the best given that year. They suddenly cared. Chuck actually commented to two professors that he wished he had paid more attention during the earlier semesters. Bob said little, but his surprising improvements were of the same order. There were no changes in the course of study, the course expectations, the faculty, or the physical environment. Something changed within them: they assented to learn.
Why? Why did these students resist learning, and more interestingly, why did they decide to learn after resisting for so long? I do not know and I probably never will. I do know how they expressed themselves and how their expressions changed after they decided to learn, or at least decided to successfully complete the courses they were taking. (Successfully passing a course and learning can be two very different things. Grades [A, B, C,…] do not always reflect what a student has actually learned as measured, for example, by a student’s ability to use the material of one course as a foundation for a subsequent course.)

Two core issues lay within this series of events. Students may be intelligent, confident and capable, but until they agree to learn, or decide to learn, or more generally, to assent to learn very little learning occurs. Learning requires consideration of more than what a student can do. Considerations of learning have to include and to encompass what the student wants to do or what the student feels a need to do. Learning is a result of will or desire as well as talent and ability. Learning is subjective as well as objective. The student’s viewpoints of learning and the value of learning must be included in any discussion of the learning process.

The second issue is that although that which is commonly regarded as subjective is also commonly unknown, sometimes even to the subject, and is not “provable” or observable (Smith, 2001; Watts, 2011). For this reason any study involving subjectivity defined in terms of internal mentality or consciousness can become murky (Watts, 2011). Defining subjectivity is a problem similar to a dilemma expressed by Newton’s lesser-known Fifth Rule: Newton reluctantly accepted the fact that he could not define gravity
or its source (“I feign no hypothesis”) (Koyré, 1965, p. 264). Later Newton used this phrase to indicate that he used no falsehood as a scientific basis. However, the inability to define gravity does not negate the existence of the phenomenon (Stephenson, 1980). Newton’s inability to define gravity also does not negate the accuracy of his scientific description of the behavior of gravity. Newton had clearly described how gravity functions and accurately determined the gravitational constants for Earth and other heavenly bodies. Engineers and scientists use his equations and understanding the operations of gravity today. The same is true of subjective expressions and viewpoints. Subjective expressions and viewpoints can be observed, recorded, and analyzed while an understanding of the source or sources of the same subjective expressions and viewpoints can remain elusive. In this light students’ assent to learn can be more accurately studied by means of students’ expressed viewpoints rather than by an interpretation of what students may be thinking or feeling.

**Learning, “Not-learning,” and the Assent to Learn**

As I recalled past observations and experiences of learners similar to Bob and Chuck’s, these observations initiated and focused my interests on understanding why some students accept learning as presented and some do not. The effects and interactions of student subjectivity during learning, student autonomy, i.e., the right to select what to learn and what not to, communications between students and teachers, and a means to evaluate learning processes from a subjective standpoint of view became a “perfect storm” of thoughts and considerations. Chuck and Bob’s example demonstrates that some
students simply make a decision not to learn and that decision is every bit as important to that student’s learning as the pedagogical skills of a teacher. What students choose to learn—their assent to learn—is every bit as important as what students are “capable” of learning. I have witnessed more subtle forms of refusing to assent to learn, or “not-learning” as Herbert Kohl (1994) expressed it. Students may accept a lower grade instead of working “up to their potential” (as if we ever know what someone else’s true potential is). Students may be resistant, maybe even disruptive in class. “Smart” students will jump through all of the required hoops and complete the course of study while having learned very little, a process I call “hoop jumping.” These students will earn an A or B, clearly a passing grade, but not learn. Students begin to study the teacher, not the topics of the course. As Eisner (1979) explained it, “One of the first things a student learns . . . is to provide the teacher with what the teacher wants or expects. The most important means of doing this is for the student to study the teacher, to learn how much effort must be expended for an A, B, or a C grade” (p. 75). I often wonder how something so obvious and important to the learning process as the assent to learn (and the non-assent to learn) and the exercise of student autonomy fail to be discussed more often in a constructive light, not as disruptive or maladjusted behavior.

**Contributions to the Assent to Learn**

Students cannot be commanded to learn. The assent to learn can be driven by the student’s epistemological beliefs (Schommer, 1998; Schommer & Dunnell, 1997; Schommer-Aikins, Duell, & Hutter, 2005) and mindsets (Dweck, 2006; Dweck &
Leggett, 1988), any number of issues pertaining to the defense or preservation of “Self,” i.e., defense of or against culture, self-image, feelings of being attacked or threatened (Chamorro-Premuzic, Furnham, Christopher, Garwood, & Martin, 2008; Erickson et al., 2008; Freire, 1970; Greene, 1988; Kohl, 1994; Lea & Sims, 2008; Leafgren, 2007; Luhmann, 1998; Merriam & Associates, 2007; Steele & Aronson, 1995; Wexler, 2006), by personal perspectives of needs, usefulness, and self-direction (Baumgartner, 2003; Knowles, Holton, & Swanson, 2005), and by students’ state of receptivity (Butler, 1988, 1997; hooks, 1994; Michelle, 2007; Zenor, 2012).

Figure 1 depicts four major contributors to the assent to learn: preservation of Self, adults learning, epistemological beliefs including mindsets, and receptivity to media, or in this case presentation. These four contributors are shown in a Venn diagram to depict the fact that each contributor can stand-alone or be interactive. For example, a student can lack confidence or be self-conscious about open expression in front of a group and believe that knowledge evolves and see no personal need to learn the material at hand and be receptive to the teacher’s methods of teaching. Each contributor deserves to be reviewed individually as well. The Venn diagram format is intended to convey that all of components can act together in any combination or act alone.
Figure 1. Potential components of the assent-to-learn model.
Mindsets and Epistemological Beliefs

Dweck (Dweck, 2006; Dweck & Leggett, 1988) developed a learning model, a mindset model based on how students approach learning when faced with difficult problems or new knowledge, and failure. The mindset model grew from observations of how students viewed themselves as learners during learning as recorded and compared by Dweck and Leggett (1988) and their team of researchers. Based on the learners’ responses to increasing difficult learning situations, some learners quickly gave up and some continued to try regardless of the level of difficulty. Dweck and Leggett (1988) labeled the latter group as adaptive-mastery oriented, those that carried on, and the former as maladaptive—“helpless,” those that gave up. As the mindset model was applied to more situations the two groups were later recategorized as students with growth mindsets and fixed mindsets, respectively (Dweck, 2006).

The growth mindset refers to students that believe that a person’s talents grow over time through challenges and by overcoming difficulties. Students who see learning as dynamic and themselves as capable of expansion and mental growth are more willing to assent to negotiating new and different learning experiences. Students with a growth mindset accept failure as a part of the learning process, while students with a fixed mindset tend only to be willing to venture into the familiar and view themselves as at the peak of their development. Students with a fixed mindset believe that they do not grow mentally and that their learning capabilities remain fixed over time, feel limited by their capabilities, and rarely attempt to exceed beyond their personal vision of their capabilities. Students’ mindset impacts their assent to learn.
Schommer-Aikins et al. (2005) have extensively researched and developed an epistemological belief model\(^2\). The epistemological beliefs of students K-12 and adult learners generally fell into five categories, (1) the ability to learn, (2) the structure or organization of knowledge, (3) the stability or certainty of knowledge, (4) the source of knowledge, and (5) the speed of learning. The ability to learn, similar to Dweck’s mindset model, addresses students’ beliefs that students’ capabilities for learning are fixed at birth, or are genetic. Learners who believe that their capabilities are fixed are more inclined to resist learning beyond what they think their capabilities are. Some students believe that knowledge is structured as isolated bits or chunks of information. These learners are inclined to over-simplify information and overestimate their comprehension. Some students believed in absolute, unchanging knowledge as opposed to evolving facts. These students typically accept tentative information as final without critical analysis or question, especially if it was received from an “expert.” Some students believe that knowledge is province of “experts” rather than the result of exploration, experience, facts, and reason. These students rarely trust their ability to recognize and discover truth as a result of their own devices. They accept information at face value and consider the matter closed without applying critical thinking. Some students believe in quick learning. People are only “meant to learn” those things that can be learned quickly. If a quick learning response is not possible, it is simply regarded as something beyond what the student was meant to learn and dropped.

\(^2\) The Schommer Epistemological Questionnaire, the college version ©. Copyright by Marlene Schommer, Ph.D. (Schommer-Aikins as of July 1, 2000).
Schommer-Aikins’ (Schommer, 1998; Schommer & Dunnell, 1997; Schommer-Aikins et al., 2005) epistemological belief model provides a clear correlation between students’ epistemological beliefs and their classroom performance and their responses to learning situations. Epistemological beliefs affect a student’s assent to learn.

Both the mindset model and the epistemological belief model agree on students’ predisposed views of themselves as learners and how these views influence their learning decisions. This point of agreement also contains an element of self-efficacy. The more flexible and versatile students see themselves, the less afraid they are of failure, and the more inclined they are to assent to learn. The manner in which students view themselves as learners, their mindset can affect their assent to learn.

(Note: Schommer’s epistemological belief model originally contained four categories (Schommer, 1990). The fifth category, the ability to learn, was added (Schommer, 1998) based on Dweck and Leggett’s (1988) work. In Dweck’s (2006) book she explained the impact of mindsets on learning in alignment with Schommer’s revised model. I do not know if the two researchers have collaborated, but they seem to be aware of each other.)

Needs, Usefulness, Applicability, and Self-direction

What students think they need and whether or not students view information as useful (applicable) are considerations stressed in adult education (Baumgartner, 2003; Knowles et al., 2005). Adults seek learning situations that they feel meet their current or future needs (not that children do not). They also decide, sometime mistakenly, what is
useful and applicable to them currently or what will be in the future. These feelings and thoughts of what is needed, useful, and applicable can affect a student’s assent to learn. Self-direction also contributes. All learning contains a self-directed component, i.e., homework, library (internet) research, written assignments, laboratory practice, etc.

Assent has to include follow-through. Assent is expressed as an act, not a thought or a whim.

**Preservation of Self**

Preservation of self, or protection or defense of self or a person’s image of his- or herself is more difficult to address because of the breadth of the topic. This discussion presented here addresses culture clash, defense of self and culture, including “face threat,” power relationships and concerns, and inquiry into needs and student autonomy: the student’s right to select what he or she will and will not learn.

An assenting process that focuses on the preservation of self is expressed beautifully and poetically in Bouchard’s (2006) *Nokum Is My Teacher*.

Answer this then please, Grandmother
Why must I go to their school?
I am told to sit and listen,
I’m supposed to somehow care
About their towns and their big cities,
Their fast cars and pretty things.
If they ever stopped to ask me
I’d prefer to drum and sing.³

In this poetic story, a Cree youth is faced with a learning decision. He seeks advice from his grandmother, his Nokum, and a dialogue proceeds. (Nokum refers to his grandmother as opposed to “grandmother” in general, or Kokum [Bouchard, 2010]. It expresses a personal familial relationship.) The grandson’s main concern is why should he learn to read when that skill does not seem to contribute to his way of life and his ability to live in his environment? How will it affect him to be imbued in another culture, a White Canadian culture, while learning to read? The grandson expresses that he has no desire to learn the teacher’s culture and he believes that the White Canadian teacher has no desire to learn his culture.

As with many conversations that which is not said is as important as that which is spoken. The grandson’s dialogue with his Nokum reflects intelligence and introspection. He can learn to read. He does not appear to suffer from what Dweck (2006) referred to as a fixed mindset reflected by a hesitancy to learn new things, or a belief that he cannot extend beyond the capabilities with which he was born. He does not express a lack of self-efficacy that would engender doubts or serve as a barrier to learning (Bandura, 1986; Dweck & Leggett, 1988). Nothing expressed in Nokum Is My Teacher (Bouchard, 2006) will prevent this youth from learning to read except his personal decision to assent to learn or to withhold his assent to learn. Neither external forces nor internal deficiencies appear to be driving the grandson towards or away from assent. His assent or dissent to learn seems more based on his strong attraction to his culture (Kohl, 1994) and his need to learn that which will prove to be useful (Knowles et al., 2005). It seems his decision will be based on whether or not he can see any personal advantage to learning to read,
and whether or not he can do this without sacrificing or undermining his Cree heritage, culture, and way of life. Here the assent to learn is clearly influenced by cultural and racial differences and the dynamics of power, compliance, and domination (Lea & Sims, 2008).

H. Kohl (1994) related a similar story of the need to preserve self. Kohl was teaching in a high school in Harlem (New York) when he encountered a Black student, Akmir. Akmir was centered in the “black power” movement of the time and was highly sensitive to how common everyday institutions and language promote and sustain racism in America’s Eurocentric culture. His major objection to the education system was its insensitivity to racism, and he resisted accepting it as “the way it is” at every turn. This led to conflicts with both teachers and administration. In no way did Akmir exhibit a lack of intelligence. His arguments were insightful and it was obvious that he was well read. He simply would not “play school” under conditions that he considered to be dehumanizing, or at least dismissive. Kohl recognized the role that student autonomy plays in the learning process. The student’s autonomy has to be respected. Once he and Akmir reached an unspoken agreement, once Akmir had assented to learn with Kohl (he never agreed to learn from Kohl), Akmir proved to be as adept a learner as anyone Kohl had met. Kohl learned as well. (This is similar to the teacher-student/student-teacher relationships described by Freire [1970]. Teaching and learning for both becomes interactive.) Kohl had never really paid attention to the biased way in which some words are used such as the negative connotations associated with “black” or “dark” (black magic, black lie, a black day, a dark heart) as well as the positive connotations associated
with “white” (white magic, white lie, pure as white). To Kohl, Akmir’s concerns became valid, not just acceptable. Akmir had the right to “not-learn” under those conditions. He had the right to defend himself culturally.

For the Cree grandson learning to read words is not just an issue of learning to read. To the grandson learning to read words is a total immersion in an alien, maybe even hostile culture and environment, an environment that does not contain and share the love and respect characteristic of the culture in which he has always lived or of his people. Kohl (1994) told of the experience of a Mexican man, a grandfather who refused to learn English. His fear? That someday in the process of learning English he would no longer know who he was. He would lose his self, or become someone else, “you do not need an identity to become yourself, you need an identity to become like someone else” (Delany, 1996, p. 19, italic in the original). He feared the cultural and social changes he witnessed in young Mexicans as they learned English and assimilated into American life. He refused to learn English for fear of losing his Mexican being. Nokum’s grandson fears losing his Cree being.

One of Nokum’s grandson’s primary questions is how does learning to read words serve any use in his daily life? Who needs (the White world’s) reading? From his standpoint, his reading skills are completely adequate for his environment. Until this barrier—the needlessness to learn to read words—is addressed, he will refuse to learn to read as many of the Cree have done. He has to see a need, a purpose, and a practical reason to assent to learn to read (Knowles et al., 2005). From his viewpoint the grandson already knows how to read as a Cree. He defines reading differently than the Canadian
schools do (Bouchard, 2006). He reads his natural environment. He does a different kind of reading.

A teacher has to understand what a request, a new topic, an assignment, or a general conversation means to the student, not what the teacher intends, but what the student actually receives. As Red Auerbach, the retired (and deceased) National Basketball League’s Boston Celtic’s head basketball coach said, “See, it’s not what I say, it’s what they hear” (Feinstein & Montange, 2006). The teacher spoke of her wonderful way of life. The grandson heard of an alien, dangerous, and difficult way of life (“You know how hard that life can be” [Bouchard, 2006]). As Sizer (1999) explained it, “What any one teacher actually teaches . . . and what an individual student hears, understands, and remembers are almost always two quite different things” (p. 163). It matters not whether or not the grandson’s perception of White life is preconceived, biased, or even false. However his opinion is derived, it will drive his reluctance to assent. Until the teacher connects at his level, says that which he can hear, there will be no assent to learn. Teachers sometime encounter what they interpret as resistance. That resistance can be a failure to assent driven by what is heard rather than what is said (hooks, 1994).

Two other influences on the grandson’s assent to learn should be considered. The differences between the teacher and the grandson, not just their cultures, could influence his assent to learn (Chamorro-Premuzic et al., 2008). The grandson tells his Nokum, “I love the way you teach me, through stories and through songs” (Bouchard, 2006). One can argue that the differences are simply pedagogical, but something in the teacher’s
manner and actions seems alien and “off-putting” to the grandson. There is a personal wall between him and the teacher as well as a cultural barrier.

The other possibility is that the grandson just does not feel like learning to read and is gauging a way to legitimately excuse himself from the task. His assent or lack of assent to learn may be driven by personal attitudes, feelings, fears, or whims that are much more difficult to define in a causal way (Smith, 2001) such as saving face (Erickson et al., 2008; Kohl, 1994). Although there is no explicit expression of these causes in the text (Bouchard, 2006), they are always possible.

**Modes of Reception**

Both Butler (1988, 1997) and hooks (1994) have commented on the performative aspects of teaching. A teacher’s presentation can be viewed in part as performance. If these performances can be viewed as a form of media, as a means of “advertising” the material being taught and hopefully being learned, then the students’ learning can be somewhat dependent upon their receptivity to the “messages” the teacher is sending. Michelle (2007) has developed a receptivity model to describe this process. People receive “the message” in four dominant modes: (a) transparent, where the observer (student) gets “lost” in the message and accepts it as-is (sees the message as life); ((b) referential, where the observer compares the message to his or her own life experiences, knowledge and personal views (sees the message as like life); (c) mediated, where the observer views the message in terms of how he or she would produce the same message, in terms of his/her own presentation skill sets and preferences (sees the message as a
production); and (d) discursive, where the observer analyzes the meaning and value of the message’s content (sees the message as informational) (Michelle, 2007, Zenor, 2012).

If students react either negatively or positively to performative teaching along the four lines suggested by the receptivity model, that reaction could impact a student’s assent to learn. Although the receptivity model as presented by Zenor (2012) and Michelle (2007) does not present the possibility of overlap between the four modes of the reception model (Figure 1), overlapping is possible and may occur. Subjectively, people can believe in ideas that seem opposite. It should also be noted that there are no continuums with the receptivity model. The assumption is that the participant will express or not express each form of reception.

Other

The four models above were selected because they are developed and researched. Other models may exist. “Other” is included to address participant responses that do not fit into the other four models but held to be important by the participants. In this type of study, the unexpected must be kept in mind and included as a possibility.

So, What Is Assent?

Sometimes all or some of the influences mentioned above, epistemological beliefs and mindsets, adult learning, preservation of self, and modes of reception act alone or in concert. This interactive assenting process can be completely spontaneous. However, once it is in existence the assent directs, affects, and almost controls the student’s reactions to and participation in the teaching-learning process. The assent to learn is an
act. It can be based on facts, opinions, doubts, ideas, beliefs, threats, fears, influences, whims, or intuition, traditions, or something completely unidentifiable, all of which may be true or false. But once decided, the act becomes an emergent fact. It becomes operant (Brown, 1980; Smith, 2001; Stephenson, 1953, 1979; Watts & Stenner, 2012). It is also performative. An assenting learner acts out as he/she believes an assenting learner should act (Butler, 1988; Stephenson, 1953). Teaching can begin without assent, but not learning. The student’s assent, at least the willingness to listen, not to pass final judgment and to withhold assent, must be present before learning can begin. The assent to learn is subjective, not from the standpoint of “inner” as opposed to “outer,” or from an inner consciousness, introspective standpoint of view, but as a spontaneous expression of the subject. “Subjective”—expressed as any resulting assent—as presented here is the viewpoint of the subject, the student. Assent as an expression or viewpoint can be observed though the source may not be apparent (Smith, 2001).

Sometimes the source of the assent to learn appears to have no cause or not to be a source at all. The assent to learn is part of the learning process (Kohl, 1994). At one time or other we all have the option to make a conscious decision to “not-learn” (Kohl, 1994), especially if we think it is detrimental to our or another’s identity and wellbeing. We possess the need as well as the autonomy to decide what we will and will not learn.

**An Appropriate Response**

The assent to learn does not negate the student’s responsibility to learn. The student cannot use the assent to learn to push learning responsibilities back to the teacher.
Pinar (2005) wrote that “teachers provide educational opportunities; students are responsible for taking advantage of them” (p. 79). Whether or not the student assents, learning lays squarely with the student, not the teacher, and Nokum clearly maintains this position (Bouchard, 2006).

From the beginning the narrator’s Nokum guides and directs her grandson’s exploration through the reasons to learn to read and his reasons not to. She never dictates or takes on his responsibility for deriving conclusions. All final conclusions are his. She offers inputs, but only those her grandson can hear. She pedagogically initiates subtle shifts in her grandson’s viewpoints (Luhmann, 1998).

Nokum’s subtle methods, her pedagogy is the essence of how including the assent to learn in pedagogical practice can work. Instead of an n-th list of pedagogical practices and “how to’s” the process suggested by Nokum’s actions are that the inclusion of the assent to learn exists completely between the teacher and the student and the negotiated learning space the teacher and the student create between and around themselves. The assent to learn includes personal action, reaction, belief, concern, defense, or one hundred other reasons that are important and legitimate to the learner. The teacher has to respond with respect and to help negotiate the student’s path through his or her objections and concerns, not respond with a one-size-fits-all edict or similar display of domination and power. Displays of domination and power will most likely make the refusal to assent stronger.

To address the assent to learn pedagogically the teacher has to take direct responsibility and engage the learner as a person, a subject. To do otherwise is to assume
a solution without knowing the problem. Imposing a predetermined solution or reaction to resistance to learning is to address the learning issues of an independent, free, thinking person without taking time to know what this person’s cause(s) for resisting are. To impose a predetermined solution in this manner is insulting and demeaning to the student and sends a message to the student that the student’s thoughts and feelings are unimportant and not worthy of consideration. The student is not to be taken seriously. The learning-teaching process has to occur between the student and the teacher, not the student and a faceless dogma of which the teacher is no more than a conduit. The reaction to the assent to learn has to be most of all human and caring, not the result of a set of predetermined bureaucratic rules.

Nokum points out that her grandson already knows how to read, albeit a different type of reading (Broadway & Conkle, 2010). The implied message is that if you can learn to read one way, and reading has proved to be beneficial, why cannot you learn to read another way and find the new reading equally beneficial? Throughout the conversation with her grandson, Nokum builds the reasons for learning to read words in terms of reading as a useful practice that can both explain the Cree way of life to those who do not understand and preserve that life for future generations. In addition to being able to drum and sing he will be able to read (and write). She points out that learning to read does not have to lead to being absorbed in another’s culture, but can be a means of preserving one’s own.

What Nokum does not do is to try to force or impose learning on her grandson. This can easily invoke a negative response. Nokum builds a case for needing to learn to
read and the performativity of reading. Reading, as performative, is what one is versus what one does (Butler, 1988). Nokum proposes that the grandson needs to be part of a transformative process. The grandson, as a Cree, needs to share Cree culture with the world in which he is an Other. She imparts a mission to her grandson and suggests that learning to read can be a necessary and valuable step in completing the mission, the preservation and the sharing of the Cree culture that the grandson holds so dear. The mission becomes the focus, not the act of learning to read. The grandson accepts the mission.

**Signs of Assent**

A sign that the assent to learn has occurred, and possibly become operant, is some performative expression of agreement or participation. That is when a subjective response becomes objective and visible or known to others (Smith, 2001). The grandson not only expressed his assent, he expresses how he intends to use what he has learned. However, not all assents to learn are this obvious. Some are subtle and slow to develop. The assent to learn can waver over time as the student struggles during learning. It is analogous to Dweck’s (2006) description of mindsets. No one has a growth mindset or fixed mindset on all topics at all times under all circumstances (Dweck, 2006). A person may possess a growth mindset toward learning, but a fixed mindset toward politics. A person’s mindset can change over time and with circumstances. Mindsets are fluid, and so is the assent to learn. It can reverse and reverse again. Learning and not-learning (Kohl, 1994) can change back and forth quickly and expresses the student’s balance between the need or
desire to learn and the need to protect self and fulfill personal goals. The constant
reversals are also a normal part of learning (Kohl, 1994).

A dominant thread throughout these examples is that the autonomy of the student
must be understood and respected if any learning is to occur. Students, or learners, are not
open receptacles for whatever teachers want to deposit into them. Nature abhors a
vacuum, but a student’s mind is not vacuous. That space is already filled with the
student’s hopes, goals, purposes, and desires as well as his or her fears and concerns. We
cannot fill a cup that is already full, so teaching and learning have be a shared
negotiation, not a unilateral edict or decree. An interchange, a swap has to take place and
that cannot occur without the student’s (and teacher’s) assent and cooperation.

It is easy to mistake not-learning with the inability to learn (Kohl, 1994). Both
learning and not-learning require intelligence, organization, and planning. The only
difference is that the learning student has assented to learn the material as presented and
the not-learning student has actively decided not to learn the material as presented. Not-
learning does not have to be “in your face” rebellion. It can be as subtle as willingly
accepting (maybe even planning to receive) a lower grade of C or even D while being
capable of an A performance. Or a student may jump through all of the required hoops of
the course and then immediately “forget” the content after the course has ended. Every
semester we watch students balance the grade they will seek against their views of what
they believe is the course’s value, not the grade they are capable of achieving. (This is
not guesswork or supposition. Students openly tell me this.)
Language can be a barrier. As the teacher describes an event or situation the student may interpret the description completely differently from what the teacher had intended. Again, teaching-learning is a negotiation. Each party has to communicate meanings that can grow into a shared understanding, not just the words. The Cree grandson is not the only student to have found a description of a teacher’s world cold and forbidding instead of wonderful as the teacher thought she or he had described it.

**Assent to Learn and Pedagogy**

Nokum’s response to her grandson’s learning concerns suggests a pedagogical practice that works favorably when soliciting student’s assent to learn. She did the following (not listed in any order; Nokum “jumped” around during the interchange with her grandson).

- She never assumed the student’s responsibility to learn.
- She guided her grandson through his reasons for resisting and withholding his assent without judgment or criticism. He had the right to express his ideas freely and openly.
- She was as open and honest with him as he was with her. (No “holding back.”)
- She asked provocative questions and made comments that encouraged the grandson to think of other possibilities and benefits.
- All final decisions were the grandson’s. Nokum never told him what he “had to do.” She respected his autonomy and his right and ability to at least
participate in his learning decisions. It was treated as a negotiation, not a dictation.

- She built on what the grandson already knew and believed.
- She helped to dispel his fears and concerns, both justified and unjustified.
- She was patient. Unlike Nokum’s grandson the student may not be convinced in one sitting, just as Akmir was not.
- She provided a possible mission, a focus that diverted the grandson’s concerns about reading to recognizing all of the things that could be accomplished with reading.

The key to Nokum’s effective pedagogy is to recognize that this is what Nokum did for this grandson at this time. She negotiated a learning space for her grandson and her that was appropriate for the existing circumstance at the time. If another grandchild has learning issues and asks for guidance Nokum may react differently so as to be effective. The reaction to the assent to learn does not lend itself to a fixed predetermined list of reactions. The appropriate pedagogy has to be a process that is literally developed in situ and that includes the reactions, issues, and goals of the student. It has to be honest, open, and trusting. Both parties have to be willing to hear things they may not want to hear and to acknowledge the other party’s right to say them. It has to be an egalitarian interchange. It may be more appropriate to label the reaction to the assent to learn a teacher-learner behavior rather than teacher-learner pedagogy.
Other Helpful Hints

Dweck (2006, 2007) recommended that people, especially children should be praised only for what they do, not for their attributes. Praising students for being “smart” only reinforces a fixed mindset. Praising accomplishments, but not denigrating failures, encourages students to try more and to do more which reinforces a growth mindset.

Encourage students to look for underlying common themes throughout a topic instead of memorizing a high volume of facts. Encourage students to run into problems, not to avoid them. Dweck (2006) suggested other areas where changes in mindset will help learning, but she warned that mindset changes take time. They are slow and rarely occur without the student’s willing introspection (metacognition). The student has to want to change. The student has to assent. As with Nokum, the teacher can only encourage and guide.

Schommer-Aikins et al.’s (2005) recommendations are similar.

Knowles (1968; Knowles et al., 2005) focused on students’ needs, views of usefulness and application, and self-direction. Students are drawn more strongly to topics and learning experiences that fulfill their current goals. They will assent to learn if they believe that the topic at hand will enhance their ability to fulfill the goal. Usefulness is determined by the same measure. Knowles (1968; Knowles et al., 2005) suggested that by presenting new information in these terms (the students’ goals), or by responding to requests for information in these terms, students are encouraged to learn in a more self-directed manner.
Assent to Learn and Curriculum

How does the assent to learn interact with curriculum? Open, free, and honest interaction between teacher and learner is a staple requirement for addressing the assent to learn. A teacher- or administrator-driven banking method curriculum does not allow interaction between teacher and student (Freire, 1970). Students’ perspectives of any kind simply are not considered. The students’ assents or declinations to learn continue to exist but may easily be ignored or regarded as dysfunctional, disruptive, abhorrent behavior. The students’ thoughts, feelings, or contributions are dismissed. “High performers” are rewarded and “low performers” are punished or dismissed (Leafgren, 2007, 2009). In this environment the assent to learn will be completely overshadowed. Students are regarded as objects, not subjects.

If the assent to learn of the student is to be considered and included, there must be a shift from the banking method and its concentration on memorization and control toward a more open problem-posing system that requires input from and interaction with the student. Students have to become part of the process not just in terms of being allowed to help formulate reactions but also by being allowed to help formulate the curriculum as a whole. Students should have direct input to the process and problem-posing and problem-solving aids in this process (Freire, 1970).

This is not always easy or forthright, especially in STEM (science, technology, engineering, mathematics) education. “Two plus two equals four” is not a philosophical quandary. It is a repeatable and reliable fact. Is it a construct? Yes. For example, if mathematics is defined as “the science of patterns and relationships,” then the science of
mathematics is a system of constructs (Zemelman, Daniels, & Hyde, 1998, p. 90). The circumstances of the problem at hand and the manner in which a student views mathematics determines how the student will attempt to solve that problem. If one is adding items, 1 + 1 = 2. If one is expressing “open” or “on” as “1” and “closed” or “off” as “0”, then 1 + 1 = 1 can be equally true and applicable (Boolean algebra). Is “two plus two equals four” deniable? No. A kindergartner can lay down two blocks, then two blocks more and learn that the resulting quantity is four. He or she can see four items even if it is not called four, i.e., if a word of another language is used. The facts of STEM are what they are, as most of us agree we can demonstrate them repeatedly with the same repeated outcomes; however, the manner of presentation is open for discussion. These facts can be presented in a “drill and kill” manner (rote memorization), the epitome of the banking method, or they can be presented in a manner that allows discovery and discussion by means of problem posing and investigation.

The assent to learn is not part and parcel to all pedagogies and curricula. A platform, circumstance, or environment must be in existence that elicits that asset be part of pedagogy and curriculum. Curriculum as a list or aggregation of “things that must be learned” can be imposed by the teacher or that list can serve as a guide for student development. “Is the real curriculum inevitably what the student knows, understands, cares about, and uses” (Sizer, 1999, p. 164)? If curriculum is defined in these terms, the assent to learn can surely be incorporated into curriculum. An imposed list is unlikely to evoke assent. Including the assent to learn is more likely to help with discovering those ideas, concerns, and interests that students care about. Again, in STEM education
implementing a pedagogy and curriculum that engages the assent to learn may be
difficult to do unless the teacher packages the material in a manner that students generally
accept even if the students do not fully assent to learn, taking into consideration that
students often switch back and forth between not-learning and learning.

**Currere**

So how can this “packaging” be implemented? How can the teacher develop a
curriculum such that it facilitates the assent to learn? Pinar’s (1975) method of *currere*
seems to fit very well because the recommended process of *currere* is very subjective and
self-referent, “the investigator of *currere*, . . . is to speak from where he lives” (p. 5).
*Currere* readily allows the thoughts and feelings of students to be included as a reference
within the thoughts and feelings of the teacher as he or she progresses through the four
stages of *currere* (regressive, progressive, analytical, synthetical), especially insofar as
interactions between student and teacher. Which students assented to learn and why?
Which students dissented and why? What could I have done differently? These questions
seem to fit naturally within the overall processes of *currere*.

This entire discussion implies that curriculum necessarily exists between two
levels. At one end is the “things to do list” of topics that must be included to meet a set of
requirements or standards of a course. At the other end are the *in situ* adjustments,
exclusions, inclusions, and deviations that must be enacted to facilitate learning and an
overall plan or general direction that allows *in situ* processes. These adjustments will
positively interact with the students’ needs and encourage their assent to learn. The
students’ assent to learn can be included, or can be the focus of constructing the *in situ* curriculum. The teacher subjectively (meditation and reflection) reviews past opportunities, future possibilities, and present implications altogether to develop an *in situ* curriculum and a clear understanding of how he or she intends to apply it in keeping with the circumstances.

**The Unknown**

Any research effort contains elements of the unknown, and there is a need to include the unknown, the unexpected, and the uncharted in any research study (Leafgren, 2007, 2009; Stephenson, 1961a). A potential problem with research is that by structuring it, it is assumed that the outcomes will fall within predictable ranges or areas or scopes. This is not always true. The outcomes may fall entirely outside anticipated ranges. Uncertainty and a means of addressing it must be included in the research process. Researchers should expect the unexpected.

For example, the assent-to-learn model can possibly have more or less than four contributors for a group of participants. The assent-to-learn model as presented here does not include the influences of strong religious and political views. It does not include the effects of racism, sexism, or homophobia. It does not include reactions to discrimination against old people, fat people, ugly people, short people, or a hundred other reasons that people discriminate. My experiences with engineering technology students, including conversations, class performance, and general course performance, lead me to conclude that epistemological issues, preservation of self, desires for usefulness and receptivity as
described above are some of the dominant factors affecting engineering technology students’ assent to learn. In addition there is wealth of literature in these areas from which to draw a useful conceptual framework (Baumgartner, 2003; Chamorro-Premuzic, et al., 2008; Dweck, 2006, 2007; Dweck & Leggett, 1988; Erickson et al., 2008; Knowles, 1968; Knowles et al., 2005; Leafgren, 2007, 2009; Merriam & Associates, 2007; Michelle, 2007; Schommer & Dunnell, 1997; Schommer, 1998; Schommer-Aikins et al., 2005, Zenor, 2012).

Learning is subjective as well as objective. What a student decides to learn or wants to learn is every bit as important as what the student is capable of learning. To some degree the student has to be willing to engage in learning. The purpose of this study was to gain a deeper understanding into what triggers a student’s assent to learn, or conversely, what drives a student to resist learning, and to use a more comprehensive approach that includes several possibilities such as epistemological beliefs, mindsets, protection of self, the student’s sense of need, usefulness and self-direction, and the mode of receptivity of student as depicted in the assent-to-learn model shown in Figure 1. This approach is also recommended by Schommer-Aikins (2004) in a process she refers to as an embedded model. She suggested that her epistemological belief model (questionnaire) should be used for research as part of a larger model, for example, the epistemological beliefs model and a self-efficacy model. Rather than using epistemological beliefs as a base of comparison, I recommend using epistemological beliefs on equal footing with preservation of self, adult learning, and receptivity considerations as shown in Figure 1, the assent-to-learn model.
The assent-to-learn model is intended to serve as a “straw man,” as a general set of ideas open to adjustment and change during its use. My intent is to allow those who participate in any study using the assent-to-learn model to contribute to its refinement as well. The participants in the study were not expected to accept the assent-to-learn model as an edict. The “final” model may appear differently that the model as presented in Figure 1.

The Significance of the Assent to Learn

The assent-to-learn model shown in Figure 1 provides sets of conditions conducive to assenting to learn, but do the elements of the assent-to-learn model actually trigger assent? What interactions and unrecognized elements affect the assent to learn? For example, a student may have a growth mindset, see a need to learn, feel culturally at home, but still not assent because he or she sees something distasteful in the teacher’s manner. As trite as this distaste may seem, the student’s learning decision can be based on something this simple. People do not always respond to stimuli in predictable ways. The unpredictability of student learning behaviors makes it worth studying. It is worthwhile to understand the nature of the assent to learn with all its nuances and unpredictability, to understand it as a fluid, give-and-take process rather than as an implementation of a “things to do” list. An understanding of assent can help to develop flexible, direct teacher-student pedagogical interactions that allow and include student unpredictability and resistance in constructive, positive ways. I plan to gain and share a clearer understanding of the assent to learn.
Students are not empty vessels. Students are full of their own ideals, goals, and perspectives, images of self and a wide range of viewpoints. Teaching and learning is an interactive negotiation between the student and the teacher during which the student’s autonomy has to be respected. Anything less is Freire’s (1970) description of the banking method. Understanding the assent to learn helps to recognize and develop an open interactive learning space created by the teacher and the student.

**Purpose**

The purpose of this study was to gain an understanding of the assent to learn from the viewpoints of students. What do students think and feel encourage their assent to learn within the conceptual frameworks of epistemological beliefs (Schommer, 1998) and mindsets (Dweck, 2006), any number of issues pertaining to the defense or preservation of self, i.e., culture, self-image, feelings of being attacked or threatened (Baumgartner, 2003; Chamorro-Premuzic et al., 2007; Erickson et al., 2008; Freire, 1970; Greene, 1988; Kohl, 1994; Lea & Sims, 2008; Luhmann, 1998; Merriam & Associates, 2007; Steele & Aronson, 1995), by personal perspectives of needs, application and usefulness (Knowles, 1968, Knowles et al., 2005; Wexler, 2006), and their mode of receptivity to teaching as performative? Other threads of thought and contributions may develop during the study.

This was an exploratory study. I have no a priori theories, including the conceptual framework presented here that I am attempting to verify or prove. I plan to record and analyze the trends and indicators pertaining to the assent to learn as expressed by engineering technology students.
Research Question

What expressed viewpoints, attitudes, beliefs, opinions, and thoughts seem to affect or drive engineering technology students’ decisions to assent to learn?
CHAPTER III

A PATH THROUGH SUBJECTIVITY

There is no doubt that Marley was dead. This must be distinctly understood, or nothing wonderful can come of the story I am going to relate.

_A Christmas Carol_, Stave 1
Charles Dickens, 1843

This was a study of subjectivity and ways in which students’ subjectivity contributes to their learning. What drives students to learn, especially adult students, from their subjective standpoint of view? My interest in student subjectivity solidified when I began to notice that what students _want_ to do impacts their learning and classroom performance at least as much if not more than what they _can_ do. It led me to review my own learning experiences and to realize that the same was true for me. How can teachers ignore students as individual or collective personalities and disregard how their views of learning impact their willingness—not their capabilities—to learn? This is equivalent to regarding students as empty vessels waiting to be filled, and students are definitely not empty, especially adult students. Students are not without thoughts, feelings, attitudes, prejudices, preferences, beliefs, preconceptions, desires, goals, fears, hopes, and concerns, i.e., complete agendas of their own, many of which are completely independent and sometimes in conflict with the teacher’s agenda.
My interests began to solidify with my observations of the classroom performance and general behavior of a small group of engineering technology students. They were disruptive in class, skipped homework assignments, and performed poorly on tests. They were rebellious. It was if they were daring the world to teach them. Then in their senior year these students’ classroom performances suddenly changed. They began to attend classes and to turn in assignments regularly. The quality of their assignments and their test grades improved. Overall their grades improved from Cs and Ds to Bs and an occasional A. One student even commented to his instructors that he wished he had paid more attention in his earlier college years. What happened? The teaching environment did not change. The level of difficulty did not change. None of these students expressed any external or objective causes for their turnaround.

A year or two later I observed the opposite: a student that was a high performer suddenly lost interest in her senior year. Her classroom attendance became erratic, she stopped submitting homework, and her test grades dropped. It was as if she no longer cared. When I pointed this out to her, she simply did not respond. On the other hand, her relationships with her fellow students remained the same. She maintained a leadership role as a source of reliable information, i.e., she continued to be a “go to” person among her peers. Why did these students decide to learn after resisting for so long or to cease participating after performing well? I do not know, but I do know how they expressed themselves and how these expressions changed during the period in which they decided to learn or not to learn.
It became apparent that learning is a choice, especially for adult learners, not an automatic Pavlovian response to teaching, and it is the student's choice. Teachers decide and control when teaching begins, but students decide when learning begins. Students may be intelligent, confident, and capable; but until they agree to learn, or decide to learn, or more generally, assent to learn, very little learning occurs. Learning requires consideration of more than what a student can do. Considerations of learning have to encompass what the student wants to do and what the student feels a need to do. Learning is a result of will or desire as well as talent and ability. It is subjective as well as objective and the students’ viewpoints of learning and the value students place on learning should be included in any discussion of the learning process.

**Exploration - The Assent to Learn**

As I began to explore subjectivity in learning I was surprised to find no direct references to subjectivity in learning. However, there were many references pertaining to subjective *expressions* of learning. I first encountered the phrase “the assent to learn” in Chapter 10 of *The SAGE Handbook of Curriculum and Instruction* (Erickson et al., 2008). This chapter focused heavily on what the authors called “face threat,” or the fear of looking inadequate to one’s peers or teachers. The student withdraws and limits responses to questions and other learning-teaching activities. Although the examples were plentiful, I found it hard to believe that learning or resistance to learning is one-dimensional. It did not match my observations. None of the students mentioned above had any problem openly expressing themselves. When they assented to learn, they accepted failure in stride.
and moved on. If “face threat” was an issue, they hid it well. (Face threat can also be viewed as a self-efficacy issue [Bandura, 1986].)

A second direct reference to the assent to learn was found in *I Won’t Learn from You* (Kohl, 1994). Kohl (1994) provided a richer view of the assent to learn from a cultural perspective. Students resist learning when they feel they have to sacrifice self during the learning process. Some students refuse to learn if they feel that their personal beliefs, culture, or way of life, that their self is being diminished, marginalized, or ignored. Students do not mind learning. They do mind being personally changed as individuals by an “outside” agent.

Kohl (1994) encountered Akmir, a student, and discovered that all (or at least most) of Akmir’s learning problems centered in Akmir’s sense of self. For example, as a Black person he found the common use of the English language offensive. Why does “black” always connote evil and the negative while “white” connotes good and the positive? What is meant by the phrase “You people . . .?” Why are minorities taught from a Eurocentric point of view with no regard for their history and culture? These concerns were the core of Akmir’s resistance to learning. Once Kohl and Akmir reached an understanding that allowed Akmir to continue to be him-self, Akmir proved to be an excellent student. He simply refused to learn on someone else’s terms. This interchange proved to be fruitful for Kohl as well (Kohl, 1994). Kohl began to look at language in new ways. He began to truly understand Akmir’s objections. As Freire (1970) has suggested, a student-teacher/teacher-student relationship emerged that proved to be beneficial to both.
Kohl (1994) also told of a Mexican student whose grandfather refused to learn English after having lived in the United States for years. The grandfather did not like the changes he saw in young Mexicans as they learned English and assimilated into American life. He resisted assimilation. He resisted losing his self by refusing to learn English, which he regarded as a major pathway to assimilation. He felt “that families and cultures could not survive if the children lost their parents’ language and finally that learning what others wanted you to learn can sometimes destroy you [italics added]” (Kohl, 1994, p. 1). The only way to encourage this student’s grandfather to learn English is to ensure the grandfather that he can remain “Mexican.” “Who do I become through listening to and speaking another language?” (Luhmann, 1998, p. 150). Kohl (1994) took this story to heart because these were the same reasons his immigrant grandfather refused to learn English and he (Kohl) refused to learn Hebrew or Yiddish. (In Kohl’s case he wanted to assimilate and the leave the “old ways” behind, a decision he regretted later.)

The need to defend self is not imaginary or whimsical. For example, it is not unjustified for indigenous North Americans to fear attacks on their culture by Western “education” programs (Wexler, 2006). Historically, the general attitudes towards indigenous peoples has been that they need to be “saved” so that they can “evolve” to a point where they can participate in modern civilization—a civilization that always happens to be Western and Eurocentric—as workers and consumers, as a functioning part of Western economies (Lea & Sims, 2008; Merriam & Associates, 2007; Wexler, 2006). In the process the native culture and way of life all but fall by the wayside as the indigenous people are absorbed into the ways of the dominant Western culture. An effective and
valued education always requires that culture be taken into account (Freire, 1970). The same sometimes applies to other cultures throughout the world (Merriam & Associates, 2007). A disregard for culture and stereotyping can occur across racial lines as well (Steele & Aronson, 1995). It can occur across lines of sexual preference and gender (Luhmann, 1998).

Although the scope of Kohl’s view of the assent to learn is broader, it only provides an additional dimension. The students of the engineering technology program mentioned above are predominately White males (over 95%) from outer ring suburban or rural areas of the state. This student body is homogenous, so cultural differences are limited, although it could be argued that differences exist between this student body and me as a Black instructor. In any event I doubt that culture alone will account for students’ assent or failure to assent to learn. Cultural influences and defense of self are part of the larger picture.

**Mindsets and Epistemological Beliefs**

Dweck and Leggett (1988) conducted a series of exercises with elementary school students in which they gave the students problems (puzzles) to solve with ever increasing difficulty. The students’ reactions were observed and recorded. The students formed two distinct groups: one group that gave up after they decided that the problems had become too difficult, and one group never gave up and considered each new puzzle or problem to simply be a challenge. Some students actually enjoyed the challenge. Dweck (2006) was surprised by this. One of her goals was to determine at what point each student would give
up. She did not expect that some students would never give up, and some would enjoy the new challenges. This exercise also made Dweck (2006) aware of her own fixed mindset and her need to defend being “smart.” She grew as a researcher as result of her observations. Dweck and Leggett (1988) named the first group “maladaptive-helpless” and the second “adaptive-mastery.” As the mindset model was applied to more situations the two groups were recategorized as students with growth mindsets (adaptive-mastery) and those with fixed mindsets (“maladaptive-helpless”) (Dweck, 2006; Dweck & Leggett, 1988).

Dweck (2006) went on to study how these two dominant mindsets affect how and what students decide to or not to learn. Mindsets influence the assent to learn. Individuals with fixed mindsets select a priori what they believe will lead to learning successes. The goal is to remain “smart” and take no risks that challenge the intellectual self. They believe that a person is either born “smart” or he or she is not. “Smart” is genetic and fixed, not dynamic and subject to effort. Failure challenges the self-image of a smart person, so the student reacts by doing his or her best to never fail. Students with fixed mindsets have a tendency to stay “within the box.” They stick with the tried and true and avoid intellectual challenges or learning risks. The task at hand is to defend the smart self rather than explore the learning opportunities being presented. Students with fixed mindsets tend to memorize and reiterate facts rather than look for underlying reasons and causes. They believe than anything that can be learned will be learned quickly on the first or second attempt. Students with fixed mindset do not believe that learning should require
extensive work or take a long time and, therefore, will not assent to learn if a quick solution is not at hand.

Students with growth mindsets are generally opposite. They believe that we get smarter over time through failure and challenges. Failure provides valuable lessons and growth. Students with growth mindsets rely on reason and look for underlying causes. They doubt and question authority. They realize that learning takes time and work.

Students with growth mindsets are more willing to assent to learn regardless of whether or not the topic at hand seems beyond what they know at the time. Although it can be argued that mindsets solely affect students’ assent to learn, once again, mindsets are not the only contributing factor.

An example of students with fixed mindsets and the affect they can have on teaching efforts and a class in general, is provided by hooks (1994) as she describes one of her teaching experiences. (Neither the “H” nor the “B” in the name “bell hooks” are capitalized.)

For reasons I cannot explain it was also full of “resisting” students who did not want to learn . . . who did not want to be in a classroom that differed in any way from the norm. To these students, transgressing boundaries was frightening. And though they were not the majority, their spirit of rigid resistance seemed always to be more powerful than any will to intellectual openness and pleasure in learning. More than any other class I had taught, this one compelled me to abandon the sense that the professor could, by sheer strength of will and desire, make the classroom an exciting, learning community. (p. 9)

Schommer (1990)–(Schommer-Aikins as of July 1, 2000)–developed an epistemological belief model based on William Perry’s 1968 research into the epistemological beliefs of undergraduate students at Harvard University (Schommer,
1990, 1998; Schommer & Dunnel, 1997; Schommer & Walker, 1995; Schommer-Aikins, 2004). Schommer’s (1990) statistical model (the result of correlation and factoring and using Likert styled surveys) led to four categorized epistemological beliefs of students, K-12 and adult learners: (1) the structure or organization of knowledge, (2) the stability or certainty of knowledge, (3) the source of knowledge, and (4) the speed of learning. Later Schommer (1998) added an additional category in alignment with Dweck’s (1988, 2006) mindset model, the ability to learn, so the revised model has five categories.

The ability to learn category: Students either believe that a person has the ability to learn, to acquire, and to enhance knowledge, or he or she does not. At the other end of the spectrum, students may believe that a person’s ability to learn grows over time based on new learning experiences. As mentioned above, students who believe that they are as smart as they will ever be are more inclined to withhold their assent to learn when faced with new learning situations. Some students believe that knowledge is compartmentalized and exists in small chunks, while other students believe that knowledge is integrated and interactive, or that the chunks are interrelated, not isolated. Students who believe in the compartmentalization of knowledge are more inclined to withhold their assent to learn when faced with interconnected ideals or concepts. Some students believe that some knowledge is certain and irrefutable, beyond doubt, question, or challenge, while others believe that knowledge constantly evolves, and that old facts give way to new facts. Students with concrete beliefs are less inclined to assent to learn if the new information being presented challenges their concrete beliefs. Some students trust experts in toto, while other students believe that all sources of information should be questioned and
verified. Students who accept expert inputs without question are more inclined to assent to learn as long as they view the input source as expert. Students who question the sources of information are more inclined to withhold assent until they are convinced that the expert’s inputs are valid. They are more inclined to engage in critical thinking. Students that believe that anything they can learn must be learned quickly tend to withhold their assent if learning takes time and practice, and if learning includes high levels of failure in the process. Students who accept that learning takes time and requires trial, error, and failure are more inclined to assent to learn when learning is slow and difficult.

Because these mindset and epistemological belief models seem complimentary I have combined them and treat them as one “epistemological belief/mindset” model. Schommer-Aikens included Dweck’s mindset model overtly as one of her categories (Schommer, 1998) and Dweck discussed mindsets along the lines of Schommer-Aikins’ five categories (2006). Dweck (2006) was careful to point out that everyone’s mindset is mixed. People possess fixed mindsets for some topics and growth mindset for others, and mindsets can change periodically pertaining to the same topic. Whenever a person’s mindset is evaluated, it is a snapshot of how they see the world at that time. The following day the snapshot may look different. Evaluations of mindsets and epistemological beliefs have to be flexible and allow room for variations. For example, a student can believe that knowledge is concrete (fixed) and believe that learning is gradual (growth). We possess a mixture of mindsets. Both epistemological beliefs and mindsets are subjective.

Because I teach adults it seems fitting to include adult learning issues that may be unique to adults assenting to learn. One of the more prominent “theories” in adult
education is andragogy. I put “theory” in quotation marks because even Knowles, the originator of andragogy (he introduced “androgogy,” the original spelling, in 1968 [Knowles, 1968]), presented andragogy not as a theory, but as a list of assumptions or framework of concepts intended to help teachers and instructors focus on the learning needs of adults (Knowles et al., 2005; Merriam, Caffarella, & Baumgartner, 2007). A common criticism of andragogy is that there is little research that truly delineates the learning processes of adults from those of children. Most of the assumptions of andragogy do not withstand scrutiny when compared to generally accepted educational theory (Merriam et al., 2007). However critics (Baumgartner, 2003; Merriam et al., 2007) agreed to varying degrees that adults possess broader ranges of personal experiences than children, that adults are more needs driven (career and other life goals, driven many times by necessity), and that adults are more prone to be self-directed as learners as they pursue learning to fulfill their career needs and interests as learners in a formal classroom setting (Baumgartner, 2003; Merriam et al., 2007).

Critics (Baumgartner, 2003; Merriam et al., 2007) also agreed that adult students consider what they think they need and whether or not to view information as useful (Baumgartner, 2003; Knowles et al., 2005). Adults seek learning situations that they feel meet their current or future needs. These feelings and thoughts of what is needed and useful, usually based on personal experiences, can affect a student’s assent to learn whether or not these feeling and thoughts are correct or mistaken. Self-direction also contributes (Knowles et al., 2005). Most academic learning for adults contains elements of
self-directed learning, i.e., homework, library or internet research, written assignments, laboratory practice, etc.

Although andragogy is questionable as it pertains strictly to adult learning, I am applying some of its concepts to learning in general (Baumgartner, 2003; Knowles et al., 2005; Merriam et al., 2007). In view of Knowles’s list assumptions and of his critics’ responses, students’ views of their needs and of the usefulness, especially in terms of applicability, of what is being taught, the broader range of adult experiences, and the tendency of adults to be more self-directed (or not) in formal learning situations, i.e., in the classroom, are included in the overall assent-to-learn model. In this sense I mean “model” as an organized description of a process, not a predictor of behavior.

Butler (1988, 1997) and hooks (1994) have written about the performative aspects of teaching and the various ways that these aspects seem to be received, or not received, by students. If teaching is performative, it can be viewed as the presentation of media, the advertisement and “selling” of topical information. Michelle (2007) has developed a receptivity model to describe the modes of receptivity to media, which for teaching purposes can be classroom presentations. Michelle (2007) and Zenor (2012) discussed four modes of receptivity or audience engagement.

- Transparent – the recipient views the message as life; becomes lost in the message and accepts it as-is.
- Referential – the recipient views the message as like life; compares the message to the experiences, knowledge, and preferences of his or her own life.
• Mediated – the recipient views the message as a production; compares the message to the way he or she would produce (teach) the same message.

• Discursive – the recipient views the message as information; analyzes the meaning and the value of the message.

The receptivity of the student can and does impact the assent to learn and can account for some of the unknown reasons students personally accept or reject teachers and their methods.

The proposed assent-to-learn model is a combination of epistemological beliefs and mindsets, preservation of self, adult learning, and receptivity to teaching as media as shown in Figure 1 and Table 1. It provided the framework within which I explored the assent to learn, but this model was not limited necessarily to the four categories given. My current position is that the assent-to-learn model may or may not reflect students’ views of the assent to learn and will have to be adapted to each new group of participants.

Subectivity

Brown’s (1980) definition of subjectivity is: Fundamentally, a person’s subjectivity is merely his own point of view. It is neither a trait nor a variable, nor is it fruitful to regard it as a tributary emanating from some subterranean “stream of consciousness” (p. 46, italics not added).
Table 1

Potential Components of the Assent-to-Learn Model

<table>
<thead>
<tr>
<th>Epistemological Beliefs/ Mindset</th>
<th>Adult Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability to learn</td>
<td>Usefulness/needs</td>
</tr>
<tr>
<td>Structure (organization) of knowledge</td>
<td>Practical application</td>
</tr>
<tr>
<td>Stability (certainty) of knowledge</td>
<td>Self-direction</td>
</tr>
<tr>
<td>Source of knowledge</td>
<td></td>
</tr>
<tr>
<td>Speed of learning</td>
<td></td>
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<table>
<thead>
<tr>
<th>Preservation of Self</th>
<th>Mode of Receptivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Face threat”</td>
<td>Transparent – “Lost” in the message as is</td>
</tr>
<tr>
<td>Cultural sensitivity</td>
<td>Referential – Compares message to own life experiences</td>
</tr>
<tr>
<td>Domination/compliance, power relationships</td>
<td>Mediated – Compares to one’s own production (teaching) experience</td>
</tr>
<tr>
<td>Freedom: academic or personal</td>
<td>Discursive – analyzes the meaning and value of message</td>
</tr>
</tbody>
</table>

The assent to learn can be based on facts, opinions, doubts, ideas, beliefs, threats, fears, influences, whims, intuition, traditions, or something completely unidentifiable, all of which may be true or false. But once decided, the act of deciding guides the student’s assent to learn. It becomes operant (Brown, 1980; Smith, 2001; Stephenson, 1953, 1979, 1980; Watts & Stenner, 2012). The student’s assent, the desire to learn, at least the willingness to listen, to not pass final judgment and withhold assent, must be present
before learning can begin. The assent to learn stems from the subjective, not from the standpoint of a stream of inner consciousness, but as an expression of the subject, and it is self-referent (Stephenson, 1979; Brown, 1980). It reflects how the student sees the world. The expression can be observed though the source cannot (Smith, 2001).

When subjectivity is viewed as inner consciousness: “What is subjective, moreover, is never open to public regard. So thus it fails on two accounts to be worthy of scientific regard—it is unreliable and it is never observable by others.” (Stephenson, 1953, p. 23). Any study involving subjectivity as inner consciousness becomes murky because there is no way to prove how or why another person feels or thinks as they do. It is a problem similar to a dilemma expressed by Newton’s lesser-known Fifth Rule: A phenomenon may be observable and known to exist, but due to the inability to assess or measure its source no comprehensive hypothesis can be developed in a scientific way (Stephenson, 1979, 1980). Newton had perfectly described how gravity functions, but was never able to explain what gravity was or its source, so he never proposed a hypothesis for gravity. “I feign no hypothesis” (Koyré’s translation, 1965).

The same is true of subjective expression. Subjective expressions can be observed, recorded, and analyzed, and can interact with the world we live in, while an understanding of the source or sources remains elusive and undefined. The source of subjectivity cannot be proven. In this light the assent to learn has to be evaluated by means of students’ expressions, not their thoughts or feelings both of which are not observable and are, thereby, unknown.
Evaluating Subjectivity

So, how is subjectivity evaluated? Stephenson (1979, 1980, 1980/2007) summarized an approach centered on what he calls the “law of concourse” or concourse theory, consciring, and the human tendency to mentally group and categorize like experiences and observations. (I avoid Stephenson’s 1953 writings because they are heavily focused on factoring to determine common points of view. Stephenson viewed factors as operants resulting from the participants’ subjective interaction with the sort statements. Factoring as a topic can overshadow the reasons for factoring in the first place: uncovering common points of view. My intent is to focus on the common points of view.)

As a group of people communicate they begin to build a shared universe of ideas, opinions, and facts, or common experiences or observations that everyone in the group holds as self-evident, or at least as possibilities. Some in the group will agree. Others will disagree, but each bases his and her personal subjective values in terms of these shared communications. Everyone feels and thinks and believes about these shared communications. This happens within a group naturally. It does not have to be initiated externally though it can be. During this communication, people begin to conscire. (Conscire is an archaic word that means to share on an intimate basis, even secretly [Stevenson, 1980, 1980/2007]. It is unlikely that a person would conscire with clerk in a bank or an auto repairman. It is highly likely that a person conscires with their spouse, family members, or close friends.) As people get to know each other and become more comfortable with each other, they are more inclined to conscire, to share intimate details of their opinions, thoughts, and feelings. A person is more inclined to explain and expose
how he or she really feels or thinks as the level of comfort rises within the group. This natural process adds to the depth, the richness of the shared communication. This natural process of group or individual communication contributes to what Stevenson (1980, 1980/2007) refers to as the law of concourse, or concourse theory.

During communication there is also a tendency to group like topics. Young children begin to demonstrate this tendency at an early age. A child may view all canines as “doggies,” and would never view a wolf seen at the zoo as furniture (Stephenson, 1980). Whether this type of classification is implied via language or simply a natural way of thinking, we as humans classify and categorize our experiences. Within the above-mentioned group of people common themes will begin to develop during their communications. At the end of an hour, for example, several identifiable topics will have surfaced. The topics discussed during this communication, especially the surfaced topics are what comprise the concourse. A list of statements, the concourse, that reflects these themes is collected and recorded. The concourse is the universe of beliefs, ideas, and thoughts naturally expressed and commonly shared by the group. None of these statements can be proven, yet they exist and reflect the participants’ thinking and feelings.

Developing a concourse in this manner is called naturalistic.

Brown’s (1993) description of concourse provides a succinct insight:

Concourse is the very stuff of life, from the playful banter of lovers or chums to the heady discussions of philosophers and scientists to the private thoughts found in dreams and diaries. From concourse, new meanings arise, bright ideas are hatched, and discoveries are made: it is the wellspring of creativity and identity formation in individuals, groups, organizations, and nations, and it is Q methodology's task to reveal the inherent structure of a concourse—the
vectors of thought that sustain it and which, in turn, are sustained by it. (pp. 93-94)

A concourse may also be developed from topical literature or interviews and can be viewed as an interaction of experts. Ready-made statements can be taken from articles, lectures, textbooks, conversations, and any other source that can be viewed as providing expert opinion (McKeown & Thomas, 1988). Sometimes the two methods of concourse development, naturalistic and ready-made, can be combined. It is always a good idea to allow a group of participants to review and discuss, even after a ready-made concourse before proceeding. Common understanding is very important.

The Q Method

Stephenson commonly referred to the methods and methodologies of Q as the “Q technique” or “Q method,” and so will I (Stephenson, 1953). A manageable number of statements are taken from the concourse to form a “Q sample.” The Q sample may be made up of the entire concourse or may be a much smaller subset of the concourse as long as the themes in question are included. An important characteristic of the Q method is that the statements within the concourse are all relative to each other. This relative comparison of statements used to evaluate subjectivity as opposed to evaluating each statement in isolation. This is a key advantage of the Q method as opposed to a Likert scale approach (Brown, 1980).

Stephenson (1953) presented the Q method as a scientific method. Regardless of the number of steps used to express the scientific method, the following elements must be present: observation and experimentation linked with structured analysis, in Newton’s
case mathematical analysis (Koyré, 1965). The development of a hypothesis and a prediction is usually included, but it is excluded with the Q method because the Q method neither hypothesizes in a rigid sense (a question is posed) nor predicts (Stephenson, 1953). The Q method is an inductive, not a deductive process, but scientific nonetheless.

There are always the *basic elements* of scientific procedure to consider—whether a proposition is accepted or not depends upon empirical grounds, but a *decision* is involved at this point, which the scientist makes, and none of these decisions is ever irreversible. The scientist can change his mind. The decisions are always in relation to a *total scientific situation*, by which we mean relative to the totality of propositions at the time. (Stephenson, 1953, p. 156, italics not added)

For the Q method the subjectivity of the researcher, the scientist, plays a role in the interpretation of the analysis rather than the “pure” interpretations of objectivity, but always within the context of the research at hand. Again, the difference between the Q method and other scientific methods is the inclusion of subjectivity, not a lack of observation, experimentation, and analysis, i.e., a clear repeatable structure.

**Differences Between the Q Method and the Use of Likert Surveys**

A common question regarding Q is, why use the Q method instead of a Likert survey? Why is one better than the other? What is better depends on context and circumstances. My current goal was to study subjectivity, so in that light I compared the Q method to the application of a Likert survey incorporating the standard application of statistics in Table 2.

I studied peoples’ opinions and although Likert surveys could have been used, the Q method was the better choice for my purposes. With the Q method people’s opinions are studied as they compare to all of the opinions of the other individuals participating in
the study. Individuals are not compared to a mean. On the other hand, the Q method cannot be used for objective purposes or to prove anything. It is not a quantitative method even though it uses statistical methods.

Table 2

Comparison of the Q Method to the Use of a Likert Survey

<table>
<thead>
<tr>
<th>Q Method</th>
<th>Likert Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Designed to study subjectivity</td>
<td>Designed for general use.</td>
</tr>
<tr>
<td>Not deterministic. Seeks most valuable description of dominant opinions.</td>
<td>Deterministic. Seeks optimal and most mathematically “correct” solution. All determinations are objective.</td>
</tr>
<tr>
<td>“Value” is determined subjectively</td>
<td></td>
</tr>
<tr>
<td>Compares and correlates people.</td>
<td>Compares and correlates traits.</td>
</tr>
<tr>
<td>Uses variances between people as a metric.</td>
<td>Uses deviations from the mean as a metric.</td>
</tr>
<tr>
<td>All statements are compared to all other available statements and ranked + to -.</td>
<td>All statement or choices are rated or evaluated individually without comparison.</td>
</tr>
<tr>
<td>Requires a small, sometimes select population to focus on each individual.</td>
<td>Requires a large population to average out the variances of individuals. One size fits all.</td>
</tr>
<tr>
<td>Participants help to structure the content of inquiry. All statements are discussed with participants to gain a common, shared understanding of each statement.</td>
<td>Participants usually have no input to the content of inquiry. Participants may or may not understand the intent or context of each statement.</td>
</tr>
<tr>
<td>Factors people into opinion groups.</td>
<td>Factors traits into ranks of importance.</td>
</tr>
<tr>
<td>Factor rotation can be conducted manually which can lead to non-optimal, but more meaningful descriptions.</td>
<td>Factor rotation is deterministic (Varimax, Equimax, etc.) and seeks one optimal solution.</td>
</tr>
</tbody>
</table>
Table 2

Comparison of the Q Method to the Use of a Likert Survey (continued)

<table>
<thead>
<tr>
<th>Q Method</th>
<th>Likert Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provides descriptions of opinions, thoughts, feeling, etc., i.e. of subjectivity.</td>
<td>Provides “proof”, i.e. consistent demonstration of objective fact.</td>
</tr>
<tr>
<td>Post-sorting interviews provide insight to a person’s selections and his or her overall opinions of the study. Information not included in the Q sample statements appears here.</td>
<td>Usually there are no post survey interviews. Participants are not treated as individuals. There is no built in mechanism to accept inputs beyond the construct of the study.</td>
</tr>
<tr>
<td>Can be used for correlation, never causation.</td>
<td>Can be used for correlation and causation.</td>
</tr>
</tbody>
</table>

Using the Q Method to Study the Assent to Learn

Subjectively no topic should be evaluated within a vacuum, in isolation. (It is debatable whether or not any topic can be.) An example of why this is important can be illustrated by any extremely controversial topic such as abortion. If asked, a pro-lifer is vehemently opposed to abortion, no questions asked, no discussion allowed, no exception. But if asked about abortion in the case of rape, incest, or saving the mother’s life, his or her position may soften. On the other hand a pro-chooser may be just as vehement about a woman’s right to choose and her right to have control of her own body, but when asked if abortion should be a commonly, casually practiced method of birth control, his or her position may soften.
We opine in a vacuum, in isolation differently than we opine within a construct of extenuating circumstances and comparisons. The Q method permits the researcher to break through the black-and-white, no-discussion-allowed opinions that we all have by ensuring that no opinion is allowed to exist in isolation. The Q method only allows comparisons and most people do not mind comparisons, especially if they do not feel that they are compromising their personal positions. Not only are these comparisons made, but the universe of comparisons that form this environment are derived by the participants, or at least reviewed and discussed by the participants. All of the participants are working within a created reference. The development of the concourse and then the Q sample is the first step of the Q method and is conducted qualitatively, i.e., no numerical processes.

The next step is for each participant to sort the statements of the Q sample. Each participant places the statements in order from “most” to “least” agreement, or likeness, or importance, or any parameter that matches the research question (see Appendix D). Each statement is assigned a numerical value that allows the ordered statements of each participant to be compared to the ordered statements of all of the other participants. The sorts, i.e., the ordered lists of the assigned values for this study, -5 to +5, for the statements, are correlated via standard correlation, but in a manner that can be construed as the transpose of a standard correlation matrix. In the Q method the meaning of each statement is subjectively assigned by the participants and the researcher whereas with the standard statistical methods data are objectively defined only by the researcher. In the Q
method each statement or measure contains the same or similar meanings to everyone participating, but not necessarily the same values, -5 to +5 (Brown, 1980).

The participants are grouped, not the statements. This was the initial proposal of Stephenson in 1935 that led to what is now known as the Q technique, method or methodology (Brown, 1980, pp. 9-10; Stephenson, 1935; see Appendix C). Standard correlation and factoring as traditionally used, or the R method as Stephenson referred to it, focuses on how each individual compares to the central tendency of the whole, or the average (or mean) of the whole, whereas the Q method focuses on how each individual compares to every other individual in the population of participants. It focuses on variance. The Q method compares variances, not central tendencies (Brown, 1980; Stevenson, 1953). The goal of factoring as part of the Q method is to ferret out the subjective views and opinions of the participants, whatever those opinions may be, pertaining to a topic, not to determine how many participants agree or disagree with a topic. The data processing steps of the Q method are quantitative (correlation, factoring and factor rotation), although there are variations as will be discussed in Chapter IV.

The final step in the Q method is to interpret the factors. The means by which interpretation is employed is the Q technique and is, again, highly qualitative and subjective. Sometimes it can become outright intuitive. The most positive and least positive statements, the distinguishing statements, and the consensus statements (the outputs of the PQMethod software) for each factor are evaluated and compared (Brown, 1980; Schmolck, 2002; Watts & Stenner, 2012). Some refer to the Q method as a mixed
method, where as others choose not to define it in any concrete qualitative-quantitative terms (Newman & Ramlo, 2010; Ramlo & Newman, 2011).

**Advantages and Disadvantages**

Accepting and including a student’s assent to learn as part of the pedagogical and curricular processes can facilitate the student’s willingness to hear what is being taught (Sizer, 1999). In this light I viewed both pedagogy and curriculum as dynamic processes revolving around direct student-teacher interaction and the learning and teaching space created by it. Curriculum is not a “things to do list” enacted by the teacher with marginal concern for the student (Freire, 1970). This allows the teacher to be more accepting of students that withhold their assent to learn. There is nothing wrong with students who choose, that decide not to learn (Kohl, 1994). This approach also requires a patience that may be hard to employ in the face of timelines and standards. The teacher has to want to do this.

The teaching, the learning, the evaluations, the results are products of the subjectivity of the participants (learners), the teachers, and the researchers. Although the Q method makes much of it observable, nothing is generalizable. It correlates, but does not establish causation. In this respect the Q method is very qualitative. The researcher, the observer, the participant, and the reader have to decide the trustworthiness of the results of this study.
General Assumptions

- What students want to do is every bit as important as what students can do.
- Subjectivity drives a large portion of students’ learning decisions.
- Stephenson’s (1953) definition of subjectivity is appropriate as applied in this study. “A person’s subjectivity is merely his own point of view” (Brown, 1980, p. 46).
- Subjective attitudes, opinions, feelings, beliefs, ideals, etc., that foster learning decisions fall into prominent categories: epistemological beliefs, mindsets, protection of self, and mode of receptivity.
- Other subjective categories may emerge during the study. Current subjective categories may be shown to be insignificant.
- The Q method is an effective method for studying subjectivity.
CHAPTER IV

METHOD – THE EVALUATION OF SUBJECTIVITY

Yet one may draw courage for the type of conjecture I have in mind from another remark of Einstein: “A new idea comes suddenly and in a rather intuitive way. That means it is not reached by conscious logical conclusions. But, thinking it through afterwards, you can always discover the reasons which have led you unconsciously to your guess and you will find a logical way to justify it. Intuition is nothing but the outcome of earlier intellectual experience.” (p. 2)


The major intent of this study is to determine which expressed viewpoints, attitudes, beliefs, opinions, and thoughts seem to affect or drive engineering technology students’ decisions to assent to learn? The assent to learn leads to acts or responses such as learning, and is triggered by the student’s subjective views of his or her learning experiences or situations (Dweck & Legget, 1988; Kohl, 1994; Schommer, 1998). The question is how best to determine what those subjective views are. A researcher can interview the learner, but if the learner is not responding in class chances are that he or she will not respond in an interview. Surveys can be used, but many times surveys are structured within the framework of what the researcher wants to know, not what the participant wants to or would like to tell.
Using the Q method assumes that it is best to allow participants an opportunity to form the statements of interest, or at least to edit and reword them (Brown, 1980; Stephenson, 1953). Using the Q method also assumes that if participants can rank these statements against each other instead of against an undefined absolute and by doing so a more accurate depiction of what the participants think and feel will emerge. The participants can develop the same general understanding and meaning of the words and concepts being used during the study, which will enhances the depth of what the participants choose to express. The Q method allows impromptu expressions of the participants’ subjectivity beyond the researcher’s established framework. The Q method was designed to allow deeper expressions of participants’ subjective views (Stephenson, 1953).

Methodology, Method, and Technique

Methodology, method, and technique are commonly used interchangeably within and without the “Q community.” I present no argument one way or the other concerning whether or not this should be or should not be as long as truthful ideas and results are communicated, but Stephenson (1953, 1961a, 1961b, 1980, 1980/2007) clearly delineated between the three.

Q Methodology

Stephenson did not instantly provide a methodology in 1935, only a method and later a technique. The development of the methodology of Q occurred over the years and was slowly presented by Stephenson bit by bit from 1935 until about 1980 (Stephenson,
1935, 1952, 1953, 1961a, 1961b, 1967/1988, 1979, 1980, 1980/2007). It is important to recognize that during his continued research with the application of the Q method and his reading, authors such as Charles Peirce (Peirce, 1940/1955) seem to have influenced his methodological development or at least his presentation of Q methodology. It is important to recognize that he was a man of his times. Many of the psychological concepts of behavior, the mathematics of factoring, and the availability of computer technology was still in its infancy at the time that Stephenson was exploring all things related to Q. As these things developed, his vision of Q methodology grew and his explanations expanded. The core components of Q methodology are (in no order of importance):

- **Consciring.** “Conscire” is an archaic word that means to share information in a personal and intimate way (Stephenson, 1980/2007). We may converse with the man behind the meat counter, but we conscire with our spouses and our siblings. This level of communication contains intimate, deeper, richer information than we would share with a stranger or casual acquaintance (Stephenson, 1980). When developing a concourse – a universe of statements – in a natural way, through the direct interaction of the participants as they ponder and discuss a topic, consciring plays a major role in the development of the concourse (McKeown & Thomas, 1988; Stephenson, 1980). The participants start as strangers, but as interactions and conversations develop, the participants generally become more comfortable and begin to share their opinions and insights more freely. Not only are ideas and opinions shared, but
so are the definitions that develop during consiring. The participants begin to
develop common or agreed definitions for words and circumstances and by
doing so they develop a shared understanding. Each person at least feels that
he or she has an understanding of what the other participants are saying. This
typically does not happen when filling out a survey form (assuming that most
surveys are not given repeatedly). The words of a survey may not hold the
same definition for all of the participants that fill it out. The shared
understanding that results from the consiring of the participants is itself
subjective. There is no guarantee that the shared understanding is “correct,”
only that it is agreed upon and understood within the circumstances shared by
the participants. Everyone arrives at a point of general common agreement of
meanings. Communications within the group are clearer to the participants. A
common context is generated. In those instances when a “ready made”
concourse is developed – constructed by the researcher from expert testimony,
literature or relevant data – a thorough discussion of the concourse by the
participants should precede its use to gain this shared understanding
(McKeown & Thomas, 1988). This includes rewording statements if it
enhances the participants’ overall understanding of the concourse.

- “Law of Mind.” Stephenson’s idea of consiring is built on, or at least in
agreement, with Peirce’s Law of Mind (Buchler, 1940/1955a).

Logical analysis applied to mental phenomena shows that there is but one
law of mind, namely, that ideas tend to spread continuously and to affect
certain others which stand to them in a peculiar relation of affectability. In
In conjunction with consiring “the law of mind” allows subjective expression to spread, interact, and morph into new ideas and understandings when shared among the participants of a group.

• **The definition of subjectivity.** Stephenson made the following statements about subjectivity as being self-referent (Stephenson, 1953). “An individual has his own ‘standpoint,’ his own ‘conception of things,’ and a hundred and one such dispositional propositions about his behavior” (p. 94). “We have a similar contribution to offer, namely, to the effect that a person’s self-notions can be studied in operational terms, to see what consistencies underlie them, if any” (p. 243). “We seek to study men’s motives, their sayings, musings, imaginings, doings, thoughts, reveries, dreams, cogitations, jealousies, and all else of the kind that a Dickens or a Shakespeare or a Hawthorne dwelt upon. This is the region of subjectivity” (p. 349). In more succinct terms Brown (1980) writes, “Fundamentally, *a person’s subjectivity is merely his own point to view*” (p. 46). “Subjectivity, in the lexicon of Q methodology, means nothing more than a person’s communication of his or her point to view. As such, subjectivity is always anchored in self-reference, that is, the person’s ‘internal’ frame of reference” (McKweon & Thomas, 1988, p. 12). The key is that subjectivity from the standpoint of Q is *expressed* self-reference. We cannot know what is in another person’s mind, but we can observe and

(94)
analyze his or her expressions that result from what is in his or her mind. Expressions become “objective” facts. It becomes what Smith (2001) calls the objectivity of subjectivity.

- **Newton’s fifth rule.** Isaac Newton’s “four rules” are the basis of the scientific method as practiced today. In 1960 Koyré (1965) discovered a fifth rule, “*hypotheses non fingo*” (Newton’s original Latin phrase) among a different group of Newton’s writings (Koyré, 1965). The common translation is “I frame no hypotheses,” but Koyré (1965) argued that “I feign no hypothesis” is the more accurate translation. When Newton presented his theories and equations pertaining to the operation of gravity, they were well received because they were demonstrable. However, he received heavy criticism as well. Although he accurately described the behavior of gravity, he could not explain what gravity was. “I feign no hypothesis” reflected Newton’s frustration and his philosophical view of phenomenon he could observe but could not explain. He refused to speculate, and his inability to explain the source and nature of gravity in no way negated the existence of gravity and his ability to accurately describe its behavior. The same is true of subjectivity. The expressions of subjectivity exist for all to see and process, but the source, or sources, remain obscure. Stephenson focused on analyzing the expressions of subjectivity rather than attempting to tackle what might be called or exist as what Brown (1980) called “a tributary of emanating from some subterranean ‘stream of consciousness’” (p. 46). Through Q Stephenson focused on the
“equations” (factors) of subjectivity, not on attempting to define or explain their source. As with gravity his inability to define the source of subjectivity in no way negates the operations of subjectivity as expression. (This phenomenon exists throughout engineering and science. We use things without knowing exactly what they are. About 260 years passed after Newton, Einstein offered a theory of what gravity is, and newer more refined theories have been presented since Einstein’s as the scientific world learns more.)

• *Factoring people instead of traits or characteristics* (Stephenson, 1935, 1952, 1953, 1967/1980). When using statistics in a normal manner large populations are used to reduce the effects of variability. Everything, including factors, is expressed by the central tendencies of the traits. Everything is factual. But there is nothing factual about subjectivity. Subjectivity consists of opinions, attitudes, beliefs, likes and dislikes, and feelings none of which can be proven, only expressed. The Q method uses statistics to group people, uses small populations in a manner that tracks and compares each individual within the group to the others of the group and uses variance instead of central tendencies to evaluate each participant’s subjective characteristics. The purpose of Q is to discover and explore, not to prove.

• The Q method uses small deliberately selected or random populations instead of large randomly selected populations. Although studies have been conducted with large populations, Stephenson (1967/1980) recommended small populations of selected individual types, not specific people *per se*, along the
lines of Fisher’s balanced block design, a factorial method. It allows an in-depth exploration of a topic while covering a wide range of personality types evenly. Again, Q is an analysis of variances, not means. For example, Stephenson (1952, 1967/1988) gave examples along the lines of a desirable population that represents men (a) and women (b), below 30 years of age (c) and above 30 (d), and urban citizens (e) and rural citizens (f). Table 3 shows the combination of individuals that would be selected, resulting in 8 categories.

Table 3

Selections Based on a Balanced Block Design

<table>
<thead>
<tr>
<th>Categories</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men (a), women (b)</td>
<td>a</td>
<td>a</td>
<td>a</td>
<td>a</td>
<td>b</td>
<td>b</td>
<td>b</td>
<td>b</td>
</tr>
<tr>
<td>Younger (c), older (d)</td>
<td>c</td>
<td>c</td>
<td>d</td>
<td>d</td>
<td>c</td>
<td>c</td>
<td>d</td>
<td>d</td>
</tr>
<tr>
<td>Urban (e), rural (f)</td>
<td>e</td>
<td>f</td>
<td>e</td>
<td>f</td>
<td>e</td>
<td>f</td>
<td>e</td>
<td>f</td>
</tr>
</tbody>
</table>

For example, category 1 in Table 3 consists of men below the age of 30 that live in a city; category 2 consists of men below the age of 30 that live rurally, and so forth. Typically two or three individuals would be selected in each category making a total of 16 or 24 participants. However, Stephenson (1967/1988) also supported randomly selecting small populations depending on what was most available under the circumstances. The difference is that in this case there would be no guarantee that
demographic conclusions could be drawn. Stephenson’s (1967/1988) argument is that small populations are more effective for the application of the Q method because of the in-depth attention paid to each participant.

- **Abductive reasoning.** Stephenson (1961b) was in agreement with Peirce’s views of the role abduction plays in developing new hypotheses and alternate solutions (Buchler, 1940/1955a). There is space in any new discovery or process between the thought, the idea, the insight, the inception, the intuitive flash, and the development of the first hypothesis, and that space is rarely filled with pure intellect and deduction. Abduction is sometimes described as the “guessing instinct” (Stephenson, 1961a). In any investigative activity there is wondering and guessing and trial and error. Abduction as described by Stephenson (1961b): “The logic of discovery thus calls for a muddling-through, lying between the extremes of Baconian induction and Newtonian deduction and it is to this that abduction refers” (pp. 12-13). Abduction is not only part of the formulation process between inception and hypothesis; it plays a major role in data interpretation and in the rotation of factors. It aids the process of discovery.

**Q Method**

The Q method consists of the following steps (Brown, 1980; Stephenson, 1953):

- **Determine a statement of interest, question, or concern.** This is equivalent to developing the research question(s). Usually, the research question is
developed by the researcher. The research statement or question reflects the general overall topic of study.

• *The formation of a concourse.* A concourse can be used to address details. For example, “What actions contributed most to winning the last presidential race?” or “What are the core elements of a good machine design.” A concourse is a “universe” of statements that represent the main themes and ideas developed by a group of participants pertaining to a given topic (naturalistic), or a universe of statements derived from the literature and/or by experts pertaining to a given topic (ready-made) (McKeown & Thomas, 1988). The concourse may also consist of a combination of naturalistic and ready-made statements.

• The Q sample, the statements that are actually used in the study, is selected from this concourse. The Q sample may be structured as a categorized list, or it may be unstructured, that is, used as stated in the concourse under no particular order (Stephenson, 1967/1988).

• *The selection of a population of participants, or the P set.* Participants can be selected randomly or by a structured means such as the balanced block method. The balanced block method can be used when there is a need, or desire, to connect the results of a Q study to selected elements in a population, such as men-women, old-young, or conservative-liberal. It is always best to review the Q sample with P set, or participants, to ensure that the meanings of the statements are clear to all especially if the concourse from which the Q
sample was taken was not developed naturally. Sometimes statements have to be reworded to accomplish a clearer understanding among the P-set (Brown, 1980; Stephenson, 1967/1988; Watts & Stenner, 2012). The P-set, or participants, and the researcher usually complete this together.

- **The Q sort.** The participants then sort the statement from most important or most agreeable to least important or least agreeable. Usually a forced distribution pattern is used for sorting (see Appendix D), but any pattern will do as long as the order of the sorted statements remains unchanged (Cottle & McKeown, 1980). The sorters are allowed to change and switch the positions of the statements during the process.

- **Processing the Q sorts.** The list of statements and the numbers of the Q sort statements are entered into a computer program, PQMethod, and each Q sort is compared to the others to create a correlation matrix as with standard statistics. The correlation matrix is factored by means of principle components analysis or the centroid method, and the resulting factors are rotated by the Varimax method or by manual rotation, also called hand and judgmental rotation. The goal is to find, to discover, descriptive relationships between factors and participants, not to mathematically optimize the solution. Usually the process is repeated many times, sometimes abductively.

- **Interpret the results.** Determine what the factors show in relation to the topic and the participants. Use inputs from post-sorting comments and interviews to assist in interpretations.
An important point is to recognize the difference between objective and subjective statements (Brown, 1980; Stephenson, 1980). “It is snowing outside” is an objective statement. One can simply walk to the nearest window or door and verify that it is or is not snowing. On the other hand, “I find the falling snow invigorating” is a subjective statement. It cannot be verified and must be taken or rejected at face value depending on how the listener views the speaker. It is an opinion. It represents how an individual is thinking or feeling at any given time. A person standing nearby may think or feel the opposite. Later that day the individual who made the comment may feel the opposite. The Q method identifies and categorizes attitudes, thoughts, feelings, and opinions, i.e., subjective statements, and in no way attempts to verify or validate them. Results may correlate to observations but never in a causal sense.

Sometimes the subjectivity of a statement may not seem clear. For example, “It is snowing heavily outside.” This statement may seem objective, but observers may not be able to agree on what is “heavily”; therefore the statement is subjective. An observer from Minnesota will evaluate a snowfall differently than an observer from Georgia. It is acceptable to ask for a subjective response to an objective or questionable statement.

Q Technique

The technique of Q is a person’s or researcher’s subjective approach to applying the Q method. Stephenson (1961b) and Brown (1980) strongly recommend abductive methods, but many researchers accept the deterministic results provided by principle component factoring (PCA – principal component analysis) and Varimax rotation. (A
major reason for doing so is to enhance the chances of being published by editors and reviewers that only relate to standard statistical methods.) Manual or hand rotation instead of Varimax rotation allows solutions to be derived abductively.

**Population and Participants**

Participants (the P-set) for this study were selected from a population of Mechanical Engineering Technology (MET) students at a mid-Western university, which is fitting since this study was initiated by my observations of and interest in these students’ views of learning. These are my observations from conversations with MET students over that ten-year period. The majority of MET student at this university are White males generally aged 28 ± 8 years old, with some being as old as 50 years (outliers), and many are considered to be nontraditional students. Most are from or live in rural or outer suburban communities. Most of these students have prior work experience or are working presently in plants, shops, or factories, and some have hobbies that involve high levels of mechanical or electrical aptitude such as building or repairing automobiles, motorcycles, or boats. Roughly 15% (estimated) of these students are serving in the military, including ROTC, or have recently served in the military, sometimes in active duty in Iraq or Afghanistan. Some are somewhat mediocre in mathematical skills or do not choose to enhance their mathematical skills. They have little interest in “playing school” or in theory. They want to become good engineering technologists, to graduate and to return to the workforce. Fewer than six students over a
10-year period have gone on to graduate school. For example, four MET students asked for my advice and for recommendations when they applied to graduate school.

The participants are volunteers from the aforementioned populations of students. Two female students were included as volunteers. Because participants self-selected to participate in the study, they fail to show equal numbers in any sub-category. Volunteers were solicited by a series of class announcements. A group of five volunteers was finally assembled to develop the concourse and are referred to as the “core group” throughout this study. The general characteristics are shown in Table 4. (General terms were used to increase anonymity. If specific data, especially age, were used, it could compromise anonymity.)

Table 4
The Core Group of Participants

<table>
<thead>
<tr>
<th>Code Name</th>
<th>Sex</th>
<th>Approx. Age</th>
<th>Work Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>∞ Infinity</td>
<td>Male</td>
<td>Young</td>
<td>Moderate</td>
</tr>
<tr>
<td>KC</td>
<td>Male</td>
<td>Mature</td>
<td>Extensive</td>
</tr>
<tr>
<td>Lucky</td>
<td>Female</td>
<td>Mature</td>
<td>Extensive</td>
</tr>
<tr>
<td>JW</td>
<td>Male</td>
<td>Mature</td>
<td>Extensive</td>
</tr>
<tr>
<td>Stan</td>
<td>Male</td>
<td>Young</td>
<td>Some</td>
</tr>
</tbody>
</table>

It should be noted that the core group of students was representative of the overall MET student group. They received Amazon gift cards. (They preferred this to a dedicated “book gift card” from Barnes and Noble for example. This group of participants, the core
group, consisted of two mature males, one mature female, and two younger males (I did not ask for ages). Three of the participants have had extensive employment experience, two of which are in the engineering technology (ET) program as part of a career change. We met in an empty classroom, door closed, in the early afternoon, so as to have access to a projector and computer software. I provided light refreshments, potato chips, pork rinds, pretzels, and an assortment of carbonated beverages (soda, pop). I also provided vegetable chips (purple and red potatoes and other root vegetables) and water. I was surprised that everyone ate the vegetable chips and water. No one ate the regular chips or pretzels or pork rinds, nor did they drink the soft drinks. These participants are just as conscientious about their studies. (They are A and B students and continue to put forth considerable effort even when they do not do well on a given assignment. No “I don’t care” students volunteered for the formation of the concourse.) I cannot say if high grades (A and B) and volunteerism tie together, but in this case both are true. At least three of these participants spend time together outside of class. During the development of the concourse the conversation was light and jovial. There was no stress or conflict.

**Concourse Development**

Concourse development, and eventually the development of the Q sort, took place in two stages. The first stage consisted of the actual development of a list of statements that encompassed the topic and reflected the participants’ attitudes and feelings. The second stage consisted of mapping those statements into the assent-to-learn model.
Stage 1

The first step of data collection for this Q study was to develop the concourse, or “universe” of statements that provided the material for the Q sample, the list of statements that a larger group of participants would sort at a future time. It was difficult to gather volunteers because of the participants’ work schedules. At the time of data collection 79% of students in the MET program work part time (10 hours per week or more) or full time (40 hours a week or more). Most students had no desire to use their free time for this study. I did not wish to excessively reward participants to encourage them to join. If a participant joins only for the reward, can his or her inputs be trusted? My opinion is that true volunteers are more trustworthy as participants than those that have to be bribed. The concourse was developed by the core group, three during the initial development and two more who joined and contributed to the further development after the initial meeting. Several times after the initial meeting the statements were distributed and reviewed by the individuals of this group to ensure that any changes I made for clarification did not alter the meaning of any of the statements expressed during the development of the concourse. This process of meeting with the core group took about a week.

The process of developing the concourse was similar to brainstorming. I introduced the general topic, what are your attitudes, concerns, opinions, feelings, and thoughts about learning in a classroom environment? The participants participated in an open discussion from there and talked about whatever they chose. No ideas were criticized, critiqued, or discarded. As statements or comments were made, I displayed
them in a Microsoft Word document via a projector. Everyone could see the statements as they were made. Only the originator of the statement could change a statement, and then only to clarify what he or she really meant to say. The entire process took a little over three hours. The participants simply “talked out.” The goal on my (the researcher’s) part was to maintain an environment that was as unstructured as possible and allow the conversation to flow. Any interjections from me (the researcher) were minimal; mostly to get the conversation back on track, however, wandering off topic is part of the process. Wandering leads to additional ideas.

The goal of this study was to observe the students engaging in free-floating, unstructured discussion and conversation about their views, opinions, attitudes, thoughts and feelings about learning and their learning experiences. This was in keeping with all tenants of developing a natural concourse. A topic was introduced by the researcher (me) that pertained to the topic of learning. Afterwards my job was to stimulate the conversation when needed. There should be no predetermined “script,” only inputs that sustain the participants’ improvisation.

So why guide the process at all? Because walking into a room and asking a group of people “What do you think?” usually leads nowhere. I presented a “straw man,” a topic and occasionally stirred the pot in way that allowed the participants to finish and to expand their thoughts and inputs. All stimuli (stirring the pot) were verbal or pictorial, not textual. In this light I had to be part of the process and could not be a quantitative observer if this process was to be effective. I made all attempts to stay out of the way, but
there is nothing “impartial” about Q. I wanted a free-for-all discussion, and that
discussion had to be free to go “off script,” but only up to a point.

Stage 2

The discussion continued until everyone felt that the topic had been fully explored
and exhausted. After the meeting (the discussion and concourse development) the
resulting concourse was compared to the assent-to-learn model. Statements that fell under
the various topics, epistemological beliefs, mindsets, etc., of the assent-to-learn model
were categorized accordingly. Those statements that did not fit into a category were
placed under “Other.” There was a strong anticipation by me (the researcher) that the
statements would align based on the research and experiences expressed by Schommer
Merriam and Associates (2007), Baumgartner (2003), Knowles (1968), Michelle (2007),
and Zenor (2012) to name a few.

Aligning concourse statements definitely was affected by my subjectivity. I made
the following decisions based on my opinions and experiences. During the process of
reducing the concourse to a Q sample I eliminated redundancies and statements that had
little to do with attitudes toward learning in the classroom. I also compared the concourse
and the emerging Q sample to the proposed assent-to-learn model. As I described the
concourse and Q sample development process earlier, it may have given the impression
that it was linear. It was not. It was a parallel and interactive process, a constant
comparing, a back-and-forth between the concourse, the model, and the reduction of
statements into a Q sample. A major goal was to minimize the loss of any meaningful information in regard to the participants’ views of learning in the classroom.

When approaching this study it was important to organize and to accept whatever exists in the concourse as it was developed, not to alter it or enhance it to verify or refute the assent-to-learn model. The assent-to-learn model provides a conceptual framework, nothing more. If the model does not apply to the inputs, the inputs take priority. During the development of the concourse, I made no effort to ensure that the concourse was in alignment with the model, and the participants were not made aware of the model. The participants’ inputs were free of any intended guidance or inputs from me as the researcher in this respect. This reduction was an iterative process. I structured the Q sample in a way that made sense to me and in a way that allowed the pieces to fit together logically.

For example, the concourse statement “I don’t like to learn if I don’t see a real-world application” can be categorized under “Adult Learning.” An earmark of adult learning is a concern with the applicability of what is being taught (Knowles et al., 2005). The statement “Resolving mistakes and problems ‘sets’ the information in my mind” relates to “Ability to learn.” This statement reflects a willingness to try again, even under difficult circumstances. On the other hand the statement “Society ties our learning and education too closely to our worth as a person” may be true, but it has little to do with personal learning in the classroom, especially in an immediate sense.

Three statements, “We are penalized for making mistakes,” “The instructor should be passionate about what he/she teaches,” and “Instructors should want to be with
students” did not fit into any of the four categories of the assent-to-learn model but were very important to all five of the core concourse generating participants. They felt that these three statements strongly impacted their willingness to learn in the classroom; therefore, these statements were retained and placed in the “Other” category. Statements that were similar to each other such as “I like to receive information in different ways from different perspectives” and “I learn best with the instructor can present the same info[rmation] in different ways” were combined into one statement.

In some cases the classification of a statement was “fuzzy.” The statement “I need to enjoy what I learn and the career I select” is categorized under “Freedom: academic or personal,” but it could have been placed under one of the “Modes of Reception” categories. It seemed to me that “enjoyment” is more of an internal condition rather than the reception of an external idea, so I categorized this statement as shown in Appendix F. This type of judgment is typical during the Q method process and relates to what Stevenson (1961b) refers to as abductive reasoning.

The Structuring of the Q Sort and the Revised Model

During this process the 75 concourse statements were reduced to a 52-statement Q sample. (Less than 40 statements limits the extent to which most topics can be thoroughly covered and more than 60 statements makes sorting overly tedious for the participants [Brown, 1980].) The Q sample, the list of 52 statements was sorted by a larger, different group of participants (Stephenson, 1967/1988) after the Q sample was reviewed by the core participants to ensure that no intended meaning was lost. The revised and reviewed
version of the Q sample was used for the remainder of this study. The categorized statements were mixed up so as not to accidentally reveal the model but to allow me to track each statement back to the model.

Processing the concourse proved to be informative in and of itself. Based on the literature I had reviewed (Erickson et al., 2008; Kohl, 1994) and my experiences with MET students I had thought that face threat and preservation of self would play minor roles in this study. This expectation proved to be untrue. Sixteen of the 52 Q sample statements are categorized under “Preservation of Self,” and five of those fall directly under “Face threat.” In this case face threat is not between students but between the instructor and the students. Students do not want to feel inadequate in the eyes of the instructor. (This realization will definitely affect my future presentations in class.)

Another addition was the focus on culture. Four of the concourse statements include cultural sensitivity. Comments indicated that it should be addressed, but little was said about how to implement it or how the participants had done it. No type of action was recommended as with the other categories. It was like saying we should all be honest. The statement is true, but how is it implemented and is it taken to heart?

The distribution of the concourse statements is uneven in relation to the model (see Figure 2) as shown in Appendix F. Fortunately, this is not a requirement for the Q method. A study may be structured with an even or uneven distribution of statements. Typically, if the researcher selects the statements, the distribution will more likely be even. This is not the case for this study. Ability to learn, structure of knowledge, practical application, the referential mode of reception, face threat, cultural sensitivity, and
dominance and compliance proved to be the dominant categories. Other categories have as little as one statement within them. Two categories, “Transparent – accept information of presentation as is” and “Mediated – Interprets content based on own presentation skills and preferences” under “Modes of Reception” were completely eliminated. The revised model is shown in Figure 2.

**Sorting the Statements – The Q Sort**

The resulting Q sample was sorted by the large group of MET students. A comment about volunteerism among MET students: I mentioned earlier that it was difficult for me to acquire volunteers for the development of the concourse. This activity required planning on the part of the participant. It required meeting outside of the participants’ normal schedules. It required sacrificing free time. The response was low and slow. It took a few weeks to gather the volunteers that participated in constructing the concourse. On the other hand, when I asked for volunteers on the spot, during a time and place in which students were already engaged, almost everyone was willing to volunteer, especially since it used class time (lab time). I walked into class and asked who wanted to participate. Of 22 students only one declined to participate after I had explained in detail that they all were free to decline. (The student that declined used the time, about 30 minutes, to complete a homework assignment that I was about to collect.) The Q sort required no planning or sacrifice on the part of the participant, so volunteerism was high even though I offered no rewards as I did with the core group.
Figure 2. Components of the revised assent-to-learn model. The Venn diagram format is intended to convey that all of components can act together in any combination or act alone.
The participants in this mechanical engineering technology (MET) group were mostly junior and seniors (bachelor degree students) and were far enough along in the program to understand more clearly how they felt about the program and themselves as students. They were familiar enough with me not to find my requests unusual or upsetting. I believed these students would provide inputs I could believe and trust rather than inputs they thought I merely wanted to hear or read.

After the participants of the group agreed to participate, I used the following instructions. The core group and the large group sorted at different times. The core group sorted just before their interviews. (These instructions are given throughout the process, not all at once at the beginning. When I give these instructions I do not always follow exact wording. I answer any questions the participants may have throughout this process. This process is semi-structured—repeatable, but not scripted.)

Each of you should have a list of statements, an envelope filled with matching statements, one on each tag, and a Q sort form.

Please read through the list of statements and familiarize yourself with them. If you have questions, please ask them. They all relate to the question:

*Which statements best (or least) reflect your attitudes and beliefs about learning?*

Some of these statements will strike you as more true or meaningful than others. Take the tags that contain these statements and place them in a pile. Other statement will strike you untrue or may be in opposition to your general opinions about learning. Place these statement tags in a second pile. Any statements that hold no significance for you one way or the other should be placed in a third pile. Usually these piles are stacked at the same time, not in any sequence. When you are done you should have three piles of statements (tags). There are no “correct” or “incorrect” selections. The piles should be constructed in any manner that seems
correct and “right” to you. The piles do not have to be even or contain any predetermined number of statements.

When you are done, rank these statements in agreement with the Q sort form. The “most true” statements should begin under the +5 column. The “least true” statements should begin under the -5 column. In general you are organizing and ranking these statements from “most true” to “least true” (or vice-versa). Use any rationale and selection method that is comfortable to you. When you are done, write the statement numbers into the corresponding blocks on the Q sort form. The numbers do not have to lie within the form given, but all statements must be used. For example, if five statements lie outside of the Q sort format, then five of the blocks should be blank inside the format. (I accompany this with verbal explanations to clarify if needed.) “Lopsided” distributions are allowed. Check for and correct any missing statement numbers or double entries. Typically if you make this type of error, you will have both: a double entry and an unused statement.

When the statement distribution is completed, please answer the follow-up questions on the Q sort form. If you have doubts or simply do not want to answer the question, leave it blank.

When the participants were done, I collected the forms and the envelopes of statement tags. The participants were permitted to keep the list of statements. Some participants wrote notes on this sheet and wanted to keep their notes.

Each participant selected a code name for anonymity. Many times these names reflect the attitudes of the participants towards the study or Q sorting process. For example, one participant selected the name “Blue Sky Research.” He or she (two female students participated) could have felt that this exercise had no practical application or purpose whatsoever as it pertained to the class topic. (Later I learned that this participant had many issues with the way the university was being run.) Usually these code names are selected with a sense of humor. One participant used my name, Roland Arter. It seems that selecting codes names became a fun part of the exercise.
Even when the instructions above were given in detail, some participants went their own way. One student filled in the Q sort form (Appendix D) from the list of statements, not with the statement tags or slips of paper. When asked he said he felt more comfortable using the list. Subjectivity manifests in many forms. Of the 26 participants (the large group plus the core group) eight filled in the Q sort form outside of the given distribution. That is about a third (30.8%) of the total group. (Filling in the distribution form unevenly has no net effect on the end result of the study [Cottle & McKeown, (1980)].) When several participants were asked or chose to comment about why they went outside of the given distribution, these participants said that they felt strongly in a positive sense (“more true,” +) about more of the statements than the given distribution allowed. I interpret this positive bias as agreement with the content of the assent-to-learn model.

After finishing the Q sort the participants were asked to answer the following questions, if they chose.

• What thoughts, opinions, or feelings led you to select your +5 choices (most true)?
• What thoughts, opinions, or feelings led you to select your -5 choices (least true)?
• How did you determine your 0 selections (neutral)?
• What other issues about your assent to learn came to mind as you filled in this form?
• Is there something additional that you think I should know to assist in my understanding of your answers?

• Is there any topic or statement that you feel should have been included or was missing from the list of statements?

• Did my presence influence any of your selections, and if so, how?

• Do you have any general comments or inputs?

In general a researcher does not always have the time or the resources to personally interview each participant of a study to determine why that participant answered the way he or she did. In lieu of interviewing each participant these questions usually shed sufficient light on the reasons why he or she made his or her selections. This information is useful because two participants may give very similar answers (sorts) or load on the same factor, but for very different reasons. This information enhances the researcher’s understanding of each factor and of the participants that load on each factor.

The core participants were also interviewed directly (recorded) to solicit verbal responses and asked the following questions similar to the questions above, but not exactly.

• Why did you select your +5 statements?

• Why did you select your -5 statements?

• Why did you select your neutral (0) statements?

• Did any of statements strike you as strange, odd, or out of place?

• Do you have any additional comments you’d like to make in general about this study?
The participants responded any way they wished, with no imposed time limits. These interviews were as unstructured as allowable. A sample transcription is shown in Appendix I. The information collected by the end of these interviews and my subjective observations constitute part of the data set for this Q study. These data consist of:

- The concourse and my evaluative observations.
- The Q sample of 52 statements aligned with the suggested assent-to-learn model.
- My observations during the Q sorting process.
- The outputs of the PQMethod program, Appendices J and K.
- The participants’ answers to the post-sort questions.
- The post-sort interviews conducted with the core participants (recorded).
- Any of my general observations during the process.

**Outputs From the PQMethod Program**

The first step of data processing was to enter the Q sort entries and the 52 statements into the PQMethod (PQM) program (Brown, 1980; Schmolck, 2002). Each Q sort was identified by the code name of the participant. The PQM program performs a correlation between each participant’s scores, +5 through -5 as assigned to each statement, and those of all of the other participants in the group. For this study the groups consisted of a class of 21 and the core group of five participants. (One of the core group members was also a student in the class. This person was counted with the core group.)
After the data were entered, I used both the principle component and the centroid factoring methods and then rotated each result with Varimax and manual rotation. In other words, I used the four combinations possible to evaluate the data. Of the four combinations I used the result that provided the most consistent and believable conclusions since I want a generally comprehensive view of the group. I looked at a combination of 1) loading as many participants as possible over the factors (minimizing confounded loadings), 2) focus on factor loadings that exceed \( 2.58/\sqrt{52} = 0.3578 \), where 52 equals the number of statements, 3) assessing the distinguished statements, those statements unique to the factor, and last but not least, 4) do the factors make sense and align with the raw data. None of these guidelines is ironclad. For example, if several of the participants’ factor loadings may be less than 0.3578 but used anyway if the other loading are much lower. Factor correlations are also compared and should be reasonably low, usually less than .4 or .5, for example. Two unique factors may have high correlation coefficients if they agree at the positive end (most true), but completely disagree at the negative end (least true), or vice-versa.

With these considerations in mind principle component (analysis) or PCA factoring with manual factor rotation provided the clearest results. I wondered if all of the core participants would have the same (similar) opinions and fall on the same factor. The fact that they did not led me to believe more strongly in the breath of the concourse. The concourse adequately covers the assent to learn as a topic.

The goal of this study was to gain insight into the participants’ viewpoints and opinions, not to verify or refute my theories. Each statement was placed on an individual
slip of paper so that the statements can be physically moved around during sorting. Each of the 26 participants selected a code name to maintain anonymity. The purpose of anonymity was to ensure that privacy was maintained between participants, especially if the results of the study are shared among the participants later, and so that if the researcher presents the study’s finding publically no participant can be identified by anyone but that participant. Follow-up interviews were conducted with the five core participants on a voluntary basis. The identities of these five participants are only known by the researcher and by each individual participant. Three core participants joined the study together and were completely aware of each other’s participation. Two others joined shortly after and were made aware as well.

Each participant ranked each Q sample statements and placed that ranking into the Q sorting form shown in Appendix D. The form’s pattern is referred to as a forced distribution pattern and is intended to help the participant focus on that which seems to be most true and least true to the participant. The shape of the pattern has little effect on the outcome as long as the order of the responses is not altered (Cottle & McKeown, 1980). Each participant was asked to answer the additional questions listed on the form. Participants may load on the same factor for very different reasons. The additional questions help to sort that out and provide a deeper understanding of what the factors mean to the participant as well as to the researcher.

After the Q sorts were completed, the results were be entered into PQMethod, a DOS-based computer program dedicated to processing Q sorts and analyzing the results (Schmolck, 2002). The Q sample statements were also entered. The study used the +5 to -
5 values (Appendix D) assigned to each statement to construct a correlation matrix \( r_{xy} \) correlation coefficients) that compares the responses of each participant to those of all of the other participants (Brown, 1980). The researcher selects a factoring method, either principle component analysis or the centroid method to produce unrotated factors. The researcher can then rotate the factors by means of Varimax or can rotate them manually. Principle component factoring and Varimax rotation are deterministic methods. They are optimized such that the same inputs will always provide the same outputs. Both are mathematically optimal. The centroid method of factoring is an estimate and a carryover from the time when factors needed to be calculated by hand. Earlier (late 1930s to late 1950s) computers were not available to everyday people to do the numerical calculation required for PCA factoring. For reasons that are still under vigorous discussion by practitioners sometimes principle component analysis reveals clearer factors and sometimes the centroid method does. Both are available to use at the researcher’s discretion. According to McKweon and Thomas (1988), it makes little difference in the results.

Varimax versus manual rotation (also called hand or judgmental rotation) is another matter. Varimax provides one optimal solution, but that solution may not reflect all of the possibilities contained within the data. Sometimes the Varimax solution is adequate, but many times it is not. The importance of a factor cannot be determined by statistical methods alone. Manual rotation allows the researcher to find other relationships and alternate solutions, some of which can prove to be more meaningful to the study (McKeown & Thomas, 1988; Stephenson, 1967/1988). Manual rotation can find these
other relationships in the data. This is where abductive logic can come into play. The researcher has no a priori knowledge to rely on, so the search for other possible rotations should proceed by trial and error, guessing, and re-reviewing the data, especially in light of the participants’ written or spoken answers to the follow-up questions. One concern is how does the researcher know that the relationships discovered are valid in that they exist? If the relationship does not exist it cannot be found. The researcher can only find orthogonal relationships that exist among the data. He or she cannot manufacture orthogonal relationships that are not there. Results determined abductively are as valid as results determined optimally. (Many scientific discoveries have been derived abductively, starting with the rather recent—20th century—theory of relativity.)

Factor selection is not solely based on mathematical methods such as Scree plots or eigenvalues or the number of participants on a factor (McKeown & Thomas, 1988). For example, a Q study was conducted at a psychiatric hospital to gain an understanding of conflicts among staff and management. The study resulted in four factors, but the fourth factor would have been discarded under standard selection methods (McKeown & Thomas, 1988). Only one participant loaded on the fourth factor, though heavily (0.75). Normally this factor would have been discarded, but this one individual was the ward physician, the ultimate decision maker in the facility. By excluding this factor the researcher would have excluded the most influential person among the staff. His opinions and beliefs affected everyone.

A second consideration is the role of manual rotation during the evaluation of this case. Once the significance or importance of the fourth factor was established the
researcher could force the fourth factor loading to be even more pronounced and view the other factors in relation to the fourth. Examining the factors relative to the ward physician provided a clearer understanding of the problem. An outcome of the study was that the ward physician’s management style was top-down and authoritarian and the staff preferred a more egalitarian and inclusive management style, although the staff did not agree among themselves how this should be implemented. The disagreements between ward physician and the entire staff was the primary source of conflict, but this possibly would have been missed if the fourth factor had been excluded because it only had one participant.

Subjectivity does not play by the same rules as objectivity, and Q methods do not follow the same rules as R methods (standard statistics). The Q researcher does not have the liberty of relying strictly on numbers. The primary concern is meaning and circumstances. After a meaningful solution is determined the outputs and factors produced by the PQMethod computer program are evaluated. Several comparisons are made.

- The rankings of the statements for each factor (ranked by z-scores) from most agreeable to least agreeable for each factor. The characteristics of each factor are derived from these rankings.
- The distinguishing statements. Each factor has statements that are unique to that factor. These statements can rank high, low, or neutral, usually with a statistical significance, \( p < 0.01 \), although \( p < 0.05 \) is the program’s standard.
The larger the number of distinguished statements usually the more unique the factor is.

- Consensus statement. These are statements that all factors share in common. The rankings may be high, low, or neutral, but they rank that way for all factors. Usually, the lower the number of consensus statements the more unique the factors are.

- The factor loadings should be \( > \frac{2.58}{\sqrt{N}} \), also written as \( 2.58/\sqrt{N} \), where \( N \) is the number of statements in the Q sample and \( p < 0.01 \). Again, this can be violated if the circumstances warrant. For example, low values for all factor loadings for a participant would justify violation of this guideline.

The characteristics that derive from the evaluations listed above are in essence the evaluation of the subjective views of the group and can be cross-correlated (compared) with other data such as group demographics. Under no circumstances should any of this information be viewed as causal. The Q method determines correlations, but never causation, although some will stretch the results to include possible causes (speculative, not factual).

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\[4\] “The rotated factors once obtained, pure factor representatives can be determined as persons with loadings in excess of \( 2.58/\sqrt{N} \) on one factor only, where \( N \) is the number of Q statements” (Brown, 1980, p. 262). Also, “Hence, \( 2.58\text{SE}_f = 2.58/\sqrt{N} = x \) would indicate that factor loadings exceeding ±\( x \) serve to define a factor” (Brown, 1980, p. 288).
Concerns

The first major concern of all that use the Q method is the dreaded one factor solution. Sometimes all of the participants load on one factor. Except for rare cases this is an unacceptable outcome. One exception was a Q study that was conducted in Eastern Cape, South Africa to identify why men with tuberculosis (TB) abandoned their free treatment at a public health clinic (Cramm, van Exel, Møller, & Finkenflügel, 2010). The study resulted in a one-factor solution. All 34 participants loaded on the one factor. The men felt stigmatized by attending a clinic that also treated AIDS patients. This one factor was in total disagreement with the prevailing theories of the government. Changes were made accordingly and these men began to come in for treatment. This is the only case I am aware in which a one-factor solution was acceptable or useful. Usually a one-factor solution occurs as a result of using a population with little or no diversity, by using a Q sample that does not comprehensively cover the topic at hand, or as in this case the entire group feels very strongly about a single issue.

One-factor solutions, and multifactor solutions for that matter, contain another possibility. What if the participants that load on the one factor have very different reasons for loading on the one factor? In that case it may be very worthwhile to investigate the various reasons for loading on that factor.

Bipolar factors are a concern, but not a problem as long as they are not interpreted as two factors. Bipolar factors are made up of two groups that are diametrically opposed on the same issues. It is analogous to two groups of data being 180 degrees apart, one positive and one negative, on the same axis. PQMethod has the ability to reverse the
polarity of a factor so that the researcher can see if it makes any difference in the total solution. A third concern is two factors that are indeed unique but have strong correlation (high correlation coefficient) to each other. This is usually because the two factors agree for the positive statements but disagree for the negative statements or vice-versa. The two factors represent different points of view but with overlapping positive or negative beliefs. Concourses and Q samples that either do not comprehensively cover the topic or contain too much redundancy can create a range of difficulties from one-factor solutions to conflicting results. The Q method thrives on diversity (variance) and an adequately broad coverage of the topic.

The Q method faces the same truth and trustworthiness issues that purely qualitative research faces. A researcher using the Q method has to look for consistency from each participant and from those that fall on the same factor. Participants can load on the same factor for very different reasons. Usually these inconsistencies can be tracked down and explained. The researcher has to believe that the participants are being generally honest until he or she sees a reason not to believe that they are honest. More than almost anything else, when using the Q method a researcher must expect the unexpected. The researcher must be open to whatever the data show.
General Research Study Plan

The general plan:

- Obtain IRB approval (Appendix A).
- Allow each participate to voluntarily join or not join the study. Have those who join sign a copy of the consent form (Appendix B).
- Determine the type of compensation, if any, for the participants’ participation. (Snacks and Amazon gift cards for the core group. Convenience for everyone else.)
- Develop a concourse as described above. Develop the Q sample from the concourse and match the statements to the assent-to-learn model where possible.
- Determine the conditions of instruction. Each Q sorting is proceeded by instructions, definitions, and clarification of the process presented by the researcher. The same Q sample can be applied to variations on a central theme. Stephenson (1953) conducted an in-depth study that consisted of eight Q sorts conducted by one person. The person was asked to sort the statements of the Q sample from eight different perspectives, using eight different conditions of instruction. If individual perspectives prove to be important during the development of the Q sample, it can be sorted several times, if necessary, to address those perspectives.
- Allow a P set, a group of participants to self-select (volunteer), especially for the development of the concourse.
• Discuss the Q sample with the participants, assuming that not all of the participants agree on the meanings of the statements.

• Sort the statements of the Q sample. The sorting process can also be conducted with several small groups, or even individually, as well as in one large group.

• Select a few of the participants, on a volunteer basis, for follow-up interviews (15-30 minutes long). These interviews will focus on clarification of why +5 and -5 selections were made, and viewpoints and opinions that occurred during the sorting process.

• Process, analyze, and report the results relative to the assent-to-learn model and Q methodology.
CHAPTER V
THE STUDY

If you do not expect the unexpected you will not find it, for it is not to be reached by search or trail.

Heraclitus of Ephesus (535 – 475 BCE)

One unexpected challenge (unexpected by me) was finding volunteers to construct the concourse for this study, which was ironic since the program’s enrollment was relatively high. I had access to more students, but the students had less interest in helping. Five students volunteered. Fortunately, these five easily expressed their ideas and opinions in a way that led to a rich concourse. The five students included one mature female, two mature males, and two younger males. (I did not ask for exact ages.) The concourse was developed naturally during a three-hour open discussion about learning in a classroom environment. As the researcher I only said enough to start the conversation and keep it going if it died down. After a little over three hours the students agreed that they were “talked out” and decided to end the session. As statements were made, I typed them into a Word document that was displayed on a screen by a projector. This way everyone could see and evaluate each statement for errors as it was entered or later if they chose. No one was misquoted. The concourse development was treated as a brainstorming exercise. Anyone could say, and thereby enter, whatever they wanted without criticism or evaluation from the other students or from me. The “raw” concourse
is shown in Appendix E. All five participants are anonymous, known only to each other and the researcher (me).

Afterwards I circulated these statements (the concourse) among these students to seek their revisions and additional inputs. Revisions were few and minor. My major concern was that each student’s statements were entered as he or she intended. Each statement is the student’s voice, not the researcher’s. I also circulated the concourse among several other students but received no replies. The stock answer was, “I was busy.” I am inclined to believe this is because students are working jobs. When I conduct end-of-the-semester surveys, one of the questions I ask is about the student’s employment. This semester 82% of the students I surveyed were working 10 hours or more per week, part-time and full-time. Quite a few students were working in excess of 40 hours per week. These percentages are notably higher than in past semesters.

Based on the resulting concourse, the first data to be collected, the assent-to-learn model was revised. The purpose of this study was not to verify the assent-to-learn model, but to use it as a framework, as a guide that leads to a better understanding of how students make learning decisions and what holds importance to them as they learn. Appendix F shows how the concourse statements were mapped into the assent-to-learn model. Like statements were combined and statements that did not relate directly to learning were eliminated resulting in 52 statements. The current Q sample, therefore, contains 52 statements. Appendix G shows the statements of the Q sample and how they numerically map into the assent-to-learn model. The statements in Appendix F are randomly mixed in the Q sample, Appendix G.
The revised assent-to-learn model is shown in Figure 3. Two of the categories of the model were removed. None of the statements fell under “Modes of Reception,” the transparent and mediated categories. None of the students expressed accepting information as-is (transparent). No statements fell into the mediated category. This may have been because the students have no direct teaching experiences with which to compare their learning experiences. So, all of the statements under the “Modes of Reception” model were referential, compared to the students’ personal experiences and preferences, except for one statement that could be construed as analytical or discursive.

The distribution of the statements under the “Epistemological Beliefs/Mindsets” model was also skewed. Most of the statements fell under the ability to learn and the structure of knowledge. Many of the students in the MET program struggle with the compartmentalization of information, so this result is not surprising. It is noted that the five students who developed the concourse considered the integration of information to be important. Only one statement each fell under stability of knowledge, source of knowledge, and speed of learning. The students recognized these issues as important but did not dwell on them.

The statements that fell under “Preservation of Self” and “Adult Learning” were evenly distributed. Face threat was more heavily emphasized than I expected. Several times students emphasized how their willingness to learn was directly impacted by how they felt they were being treated by the instructor and how they felt they compared to other students (with more emphasis on the instructor). Three statements did not seem to
fit into the model’s categories but were deemed to be important by the students, so they were included under “Other.”

- We are penalized for making mistakes. That impacts how I learn.
- The instructor should be passionate about what he/she teaches.
- The instructor should want to be with students.

The revised assent-to-learn model is shown in Figure 3 and the distribution of the statements is shown in Table 5.

**Description and Exploration of Results**

There were three factors for this group of participants. The factor loadings are shown in Table 6. A summary of what participant loads on what factor is shown in Table 7. None of the factors mapped totally into any of the sub-models of the assent-to-learn model. Each factor reflects a mixture of categories though some categories are more pronounced than others. Most of the comments contributed by the participants supported the theme of the factor. The verbal interviews supported the written comments of the participants who were interviewed. The trends in the data were consistent. Most of the following discussions focus on what was important to the participants.

(Except for two females all of the participants in this study are male. In keeping with maintaining anonymity I will refer to all participants as “he.” With only two female participants it is easily possible to guess who “she” is. The women did not select feminine sounding pseudonyms.)
Figure 3. Components of the assent-to-learn model resulting from the development of the concourse.
Table 5

Components of the Assent-to-Learn Model

<table>
<thead>
<tr>
<th>Epistemological Beliefs/ Mindset</th>
<th>Adult Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability to learn</td>
<td>Usefulness/needs</td>
</tr>
<tr>
<td>Statements: 1, 14, 24, 33, 40, 46, 51</td>
<td>Statements: 4, 35</td>
</tr>
<tr>
<td>Structure (organization) of knowledge</td>
<td>Practical application</td>
</tr>
<tr>
<td>Statements: 2, 15, 25, 34, 41, 47</td>
<td>Statements: 5, 6, 17, 27, 42</td>
</tr>
<tr>
<td>Stability of knowledge</td>
<td>Self-direction</td>
</tr>
<tr>
<td>Statements: 3</td>
<td>Statements: 7, 48</td>
</tr>
<tr>
<td>Source of knowledge</td>
<td></td>
</tr>
<tr>
<td>Statements: 16</td>
<td></td>
</tr>
<tr>
<td>Speed of learning</td>
<td></td>
</tr>
<tr>
<td>Statements: 26</td>
<td></td>
</tr>
<tr>
<td>Preservation of Self</td>
<td>Mode of Receptivity</td>
</tr>
<tr>
<td>“Face threat”</td>
<td>Referential – Compares message to own life experiences</td>
</tr>
<tr>
<td>Statements: 9, 20, 29, 37, 44</td>
<td>Statements: 8, 18, 28, 36, 43, 49, 52</td>
</tr>
<tr>
<td>Cultural sensitivity</td>
<td>Discursive – analyzes the meaning and value of message</td>
</tr>
<tr>
<td>Statements: 10, 21, 30, 50</td>
<td>Statements: 19</td>
</tr>
<tr>
<td>Domination/compliance, power relationships</td>
<td></td>
</tr>
<tr>
<td>Statements: 11, 22, 31, 38, 45</td>
<td></td>
</tr>
<tr>
<td>Freedom: academic and personal</td>
<td></td>
</tr>
<tr>
<td>Statements: 12, 23</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>Statements: 13, 32, 39</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Statements refer to the statements in the Q sample shown in Appendix G. The numbers in parentheses match the statement numbers above and indicates where the statements fit within the model.
Table 6

Factor Loadings

<table>
<thead>
<tr>
<th>Participant</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>A please</td>
<td>0.3556</td>
<td><strong>0.5256X</strong></td>
<td>0.0692</td>
</tr>
<tr>
<td>Fred</td>
<td>0.2815</td>
<td>-0.0037</td>
<td>0.2653</td>
</tr>
<tr>
<td>Beer Lover</td>
<td>0.2295</td>
<td>0.1426</td>
<td><strong>0.2103</strong></td>
</tr>
<tr>
<td>Joe Smith</td>
<td><strong>0.5043X</strong></td>
<td>0.2740</td>
<td>0.1945</td>
</tr>
<tr>
<td>Code Name</td>
<td><strong>0.6856X</strong></td>
<td>-0.0125</td>
<td>-0.1578</td>
</tr>
<tr>
<td>G</td>
<td><strong>0.7767X</strong></td>
<td>-0.0247</td>
<td>0.0427</td>
</tr>
<tr>
<td>Blue Sky Research</td>
<td>0.3207</td>
<td><strong>0.5514X</strong></td>
<td>0.0343</td>
</tr>
<tr>
<td>Heisenberg</td>
<td>0.3650</td>
<td>0.1343</td>
<td><strong>0.4222X</strong></td>
</tr>
<tr>
<td>Roland Arter</td>
<td><strong>0.4603X</strong></td>
<td>0.3449</td>
<td>0.2856</td>
</tr>
<tr>
<td>George Washington</td>
<td>-0.0549</td>
<td><strong>0.8226X</strong></td>
<td>-0.0864</td>
</tr>
<tr>
<td>Derek Zoolander</td>
<td>0.1479</td>
<td>0.2053</td>
<td><strong>-0.4498X</strong></td>
</tr>
<tr>
<td>Anheuser</td>
<td>0.1727</td>
<td>0.2636</td>
<td><strong>-0.4992X</strong></td>
</tr>
<tr>
<td>56</td>
<td>0.3362</td>
<td><strong>0.4120X</strong></td>
<td>0.2295</td>
</tr>
<tr>
<td>Victor</td>
<td><strong>0.6780X</strong></td>
<td>0.2569</td>
<td>0.0016</td>
</tr>
<tr>
<td>Ron White</td>
<td>0.2688</td>
<td>0.2757</td>
<td><strong>0.2734</strong></td>
</tr>
<tr>
<td>Boulder</td>
<td>0.2327</td>
<td><strong>0.5333X</strong></td>
<td>0.3196</td>
</tr>
<tr>
<td>Ak15</td>
<td>0.3574</td>
<td><strong>0.6192X</strong></td>
<td>-0.1642</td>
</tr>
<tr>
<td>All Out of Bubble</td>
<td>0.3205</td>
<td><strong>0.5375X</strong></td>
<td>-0.1866</td>
</tr>
<tr>
<td>Gum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>McLovin</td>
<td>0.0472</td>
<td><strong>0.6192X</strong></td>
<td>0.3918</td>
</tr>
<tr>
<td>Payton Manning</td>
<td><strong>0.6663X</strong></td>
<td>0.2599</td>
<td>-0.1498</td>
</tr>
<tr>
<td>∞ (Infinity)</td>
<td><strong>0.4948X</strong></td>
<td>0.2380</td>
<td>0.0818</td>
</tr>
<tr>
<td>KC</td>
<td>0.3517</td>
<td><strong>0.4798X</strong></td>
<td>-0.0290</td>
</tr>
<tr>
<td>Lucky</td>
<td><strong>0.5410X</strong></td>
<td>0.2770</td>
<td>-0.1049</td>
</tr>
<tr>
<td>Stan</td>
<td>0.1210</td>
<td>-0.0907</td>
<td><strong>0.6945X</strong></td>
</tr>
<tr>
<td>JW</td>
<td><strong>0.7205X</strong></td>
<td>0.0239</td>
<td>-0.0242</td>
</tr>
<tr>
<td>Number 10</td>
<td><strong>0.6607X</strong></td>
<td>0.0115</td>
<td>0.0410</td>
</tr>
</tbody>
</table>

X - Factor loadings
* - Confounded loadings
Table 7

Summary of Factor Loadings for Participants

<table>
<thead>
<tr>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3 (bipolar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joe Smith</td>
<td>A Please</td>
<td>Heisenberg (+)</td>
</tr>
<tr>
<td>Code Name</td>
<td>Blue Sky Research</td>
<td>Derek Zoolander (-)</td>
</tr>
<tr>
<td>G</td>
<td>George Washington</td>
<td>Anheuser (-)</td>
</tr>
<tr>
<td>Roland Arter</td>
<td>Boulder</td>
<td>Stan (+)</td>
</tr>
<tr>
<td>Victor</td>
<td>Ak15</td>
<td></td>
</tr>
<tr>
<td>Payton Manning</td>
<td>All Out of Bubble Gum</td>
<td></td>
</tr>
<tr>
<td>∞ (Infinity)</td>
<td>McLovin</td>
<td></td>
</tr>
<tr>
<td>Lucky</td>
<td>56</td>
<td></td>
</tr>
<tr>
<td>JW</td>
<td>KC</td>
<td></td>
</tr>
<tr>
<td>Number 10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. Confounded loadings: Fred, Beer Lover, Ron White

**Factor 1** (Table 8): *Joe Smith, Code Name, G, Roland Arter* (not the researcher), *Victor, Payton Manning, ∞ (Infinity), Lucky, JW,* and *Number 10* loaded on Factor 1.

*Lucky, ∞,* and *JW* were members of the core group. This group believed that processing mistakes is an effective means of learning and they preferred to learn by doing.

(“Learning about exercising but never exercising is not learning,” statement 27.) They believed that they learn best from instructors who are knowledgeable. This group liked to receive information in different ways with in-depth explanations of how problems are
solved. They expressed no face threat issues and were not concerned with presentation methods. They believed that using technology to teach can be very effective (hands on and entertaining).

The detailed data for **Factor 1** are shown in Table 8. **Factor 1**’s participants supported their statement selections, and therefore their loadings, as follows. ∞ (*Infinity*) thought it is important to resolve mistakes because “if I don’t resolve a mistake, I could come across the problem again in life and not know how to solve it.” Solving mistakes “sets” the information in the mind. *Lucky* simply stated, “We learn by our mistakes.” *JW* thought students naïve for believing that mistakes should not carry penalties. “Learning is a series of mistakes. Over time with practice the mistakes go away.” Processing mistakes is a means of learning.

The following quotations were made by the participants, mostly from the participants’ responses to the follow-up questions on the Q sorting form (Appendix D). *JW* made several statements about learning. “Everyone learns at different speeds.” “Real learning is being able to apply a concept to different situations.” *Roland Arter* (not the researcher) commented that “learning takes a lot of time,” and *Payton Manning* commented that, “Learning is the ability to understand new information.” *Victor* recognized that “just because I memorize the answers to a test doesn’t mean I’ll retain it.”
Table 8
Factor 1 – Raw Data Outputs of PQMethod Program

<table>
<thead>
<tr>
<th>Stmt Nbr</th>
<th>Statement</th>
<th>Mod Nbr</th>
<th>Stmt Nbr</th>
<th>Statement</th>
<th>Mod Nbr</th>
</tr>
</thead>
<tbody>
<tr>
<td>40*</td>
<td>Resolving mistakes and problem “sets” the information in my mind</td>
<td>5</td>
<td>35</td>
<td>Working in classroom “kills learning out.” It detracts from what is actually going on in a real-world sense.</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Learning is understanding and comprehending concepts, not just memorizing.</td>
<td>1</td>
<td>18*</td>
<td>Using new presentation technologies in the classroom is “lazy” teaching.</td>
<td>27</td>
</tr>
<tr>
<td>27*</td>
<td>Learning <em>about</em> exercising, but never exercising, is not learning.</td>
<td>22</td>
<td>36</td>
<td>Reading directly from a textbook with no extra examples or inputs from the instructor.</td>
<td>29</td>
</tr>
<tr>
<td>33*</td>
<td>Mistakes are part of the learning process.</td>
<td>4</td>
<td>20*</td>
<td>I compare myself to others.</td>
<td>35</td>
</tr>
<tr>
<td>16</td>
<td>I learn best when the instructor understands the material.</td>
<td>15</td>
<td>46*</td>
<td>I learn best when the homework and test problems are exactly like the example problems covered in class.</td>
<td>6</td>
</tr>
</tbody>
</table>

Additional distinguished statements – statements unique to this factor

<table>
<thead>
<tr>
<th>Stmt Nbr</th>
<th>Statement</th>
<th>Mod Nbr</th>
<th>Stmt Nbr</th>
<th>Statement</th>
<th>Mod Nbr</th>
</tr>
</thead>
<tbody>
<tr>
<td>25*</td>
<td>I want to see more in-depth explanations of how problems are solved.</td>
<td>10</td>
<td>45*</td>
<td>If I feel something should be done a certain way and the book recommends another way, I follow the book to reduce the chance of making a mistake and losing points.</td>
<td>47</td>
</tr>
</tbody>
</table>
Table 8
Factor 1 – Raw Data Outputs of PQMethod Program (continued)

<table>
<thead>
<tr>
<th>Stmt Nbr</th>
<th>Statement</th>
<th>Mod Nbr</th>
<th>Stmt Nbr</th>
<th>Statement</th>
<th>Mod Nbr</th>
</tr>
</thead>
<tbody>
<tr>
<td>52*</td>
<td>I like to receive information in different ways from different perspectives.</td>
<td>32</td>
<td>29*</td>
<td>I feel bad when I am not grasping things as quickly as the people around me</td>
<td>36</td>
</tr>
</tbody>
</table>

(* indicates distinguished statements)

The participants who loaded on factor 1 seem to have given a fair amount of thought to learning and what it means to them. It is as if they have learning goals. They believe it is important to process mistakes, even if it takes a long time, and they realize that learning is what the student leaves with, not what the student enters with. What has been learned can be demonstrated. If it cannot, then no learning has occurred, or at least only partial learning has occurred.

It was important to the participants of this group to have an instructor that understands the material being taught and is able to convey that understanding to students. The source of knowledge is important to these participants. JW commented that “in order to truly learn you need to have an instructor that understands the material.” Code Name explained, “Many professors are intelligent but are bad at teaching/relaying their knowledge.” The instructor must demonstrate that he or she has learned to be viewed as a legitimate source of knowledge by these participants.
It was important to the participants of this group to have an instructor that understands the material being taught and is able to convey that understanding to students. The source of knowledge is important to these participants. JW commented that “in order to truly learn you need to have an instructor that understands the material.”

Code Name explained, “Many professors are intelligent but are bad at teaching/relaying their knowledge.” The instructor must demonstrate that he or she has learned to be viewed as a legitimate source of knowledge by these participants.

This group accepts new technologies used for teaching, i.e., using technology is not “lazy teaching.” Roland Arter believed that “new technologies used for learning helps to keep learning ‘hands-on’ and . . . sometimes is more entertaining.” ∞ believed that “new presentation technology can be very helpful.” Application was very important to these participants, or as Roland Arter stated, if “you can’t apply what you’ve learned . . . did you actually learn anything?” These statements about processing mistakes and learning predominately express a growth mindset. They understand that learning is a long-term endeavor, not only lasting until the next test is passed.

Again, comments made by the participants of this group were in keeping with the +5 statements and distinguishing statements for this factor. One participant, Number 10, offered a different perspective. He declared, “I am Christian,” and answered several questions from what seemed to be from that perspective. For example he commented, “Well I feel as if I am what I am and if I enjoy something, then I believe I was created to do it more than other things,” and “I also think we should (illegible) . . . to do the best we
can with our morality.” These statements seem contrary to the growth mindset expressed by the other participants of this factor. Determining results \textit{a priori} based on personal beliefs and the belief that “we are what we are” is usually characteristic of a fixed mindset. It broaches the question of how religion affects what and how we learn.

So, why is \textit{Number 10} included in a factor with so many others that express clear growth mindsets? Because when reviewing his Q sort his selections showed that he believes that understanding is more important than memorizing (statement 1), that learning is about exercising, not just talking about exercising (statement 27), and that making mistakes is part of the learning process (statement 33). In general, he believed as the others in this group believe but for different reasons. This is an example of how participants may load on a factor for different reasons and why evaluating factors qualitatively is so important.

The participants in this group, Factor 1, are straightforward, self-directed learners that do not express a dependency on instructors, although they clearly express a concern about the instructors’ understanding of the topic at hand. They seek practical results for practical reasons. I titled this factor “Self-directed.”

\textbf{Factor 2} (Table 9): \textit{A Please, Blue Sky Research, George Washington, 56, Boulder, Ak15, All Out of Bubble Gum, McLovin,} and \textit{KC} loaded on Factor 2. \textit{Boulder} did not answer any of the follow-up questions. \textit{KC} was a member of the core group. The participants of this factor focused mostly on the instructor. This group is more comfortable with instructors that start with basic concepts and progress to more complex topics without jumping around (no unexplained shortcuts). These participants do not like
“canned” Powerpoint presentations. They want the instructor to provide his/her own explanations in a manner that includes history and humor. They prefer that test problems be like the homework problems. They do not like to extrapolate from one situation to another even though the core concepts are the same. They do, however, consider understanding to be more important than just memorizing. They like instructors who seem to care more about students than maintaining the course schedule and feel that they learn better when they feel that they are successful at learning. They do not always work well through failure and are not focused on learning per se. They do not compare themselves to other students.

KC commented, “If you do not understand the foundation of the topic at hand, how can you progress and grasp the in-depth parts of that topic?” The building block approach to teaching and learning is very important to KC. A Please leans toward instructors that are “caring, helping, and knowledgeable.” He also believed that “understanding is more important than memorizing.” A Please added, “The ability to find an answer is sometimes more important than knowing an answer and it being wrong.” George Washington gave his views about teaching with Powerpoint. “Powerpoint teaching sucks!!”
Table 9
Factor 2 – Raw Data Outputs of PQMethod Program

<table>
<thead>
<tr>
<th>Stmt Nbr</th>
<th>Statement</th>
<th>Mod Nbr</th>
<th>Stmt Nbr</th>
<th>Statement</th>
<th>Mod Nbr</th>
</tr>
</thead>
<tbody>
<tr>
<td>47*</td>
<td>The instructor should start with basic concepts and progress in sequence to more complex topics without jumping around.</td>
<td>13</td>
<td>50*</td>
<td>Society ties our learning and education too closely to our worth as a person.</td>
<td>42</td>
</tr>
<tr>
<td>28*</td>
<td>Presenting with PowerPoint, page after page, becomes boring and impairs learning.</td>
<td>28</td>
<td>51*</td>
<td>It does not make sense to argue about homework or test points instead of using that time to learn more.</td>
<td>7</td>
</tr>
<tr>
<td>46*</td>
<td>I learn best when the homework and test problems are exactly like the example problems covered in class.</td>
<td>6</td>
<td>10*</td>
<td>Learning of other cultures is important.</td>
<td>39</td>
</tr>
<tr>
<td>23*</td>
<td>I learn best when the instructor is more concerned with how the students are learning than with the target dates in the syllabus.</td>
<td>49</td>
<td>14*</td>
<td>Learning can be uncomfortable.</td>
<td>2</td>
</tr>
<tr>
<td>44*</td>
<td>I learn better if I feel I am succeeding at it.</td>
<td>38</td>
<td>20*</td>
<td>I compare myself to others.</td>
<td>35</td>
</tr>
</tbody>
</table>

Additional distinguished statements – statements unique to this factor

<table>
<thead>
<tr>
<th>Stmt Nbr</th>
<th>Statement</th>
<th>Mod Nbr</th>
</tr>
</thead>
<tbody>
<tr>
<td>43*</td>
<td>Learning is understanding and comprehending concepts, not just memorizing.</td>
<td>30</td>
</tr>
<tr>
<td>43*</td>
<td>I don’t like to learn if I don’t see a meaningful result, purpose, or value.</td>
<td>17</td>
</tr>
</tbody>
</table>
Table 9
Factor 2 – Raw Data Outputs of PQMethod Program (continued)

<table>
<thead>
<tr>
<th>Stmt Nbr</th>
<th>Statement</th>
<th>Mod Nbr</th>
<th>Stmt Nbr</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1*</td>
<td>Humor, history, practicality makes for a good presentation from an instructor.</td>
<td></td>
<td>1</td>
<td>E/M</td>
</tr>
</tbody>
</table>

(* indicates distinguished statements)


KC commented, “If you do not understand the foundation of the topic at hand, how can you progress and grasp the in-depth parts of that topic?” The building block approach to teaching and learning is very important to KC. A Please leans toward instructors that are “caring, helping, and knowledgeable.” He also believed that “understanding is more important than memorizing.” A Please added, “The ability to find an answer is sometimes more important than knowing an answer and it being wrong.”

George Washington gave his views about teaching with Powerpoint. “Powerpoint teaching sucks!”

There was a heavy emphasis among these participants about what instructors should do, should not do, and who they should be. 56 commented, “If an instructor isn’t knowledgeable, it can make [learning] more confusing.” George Washington felt that “some teachers in the program are so old school and set in their ways [that] they
shouldn’t be teaching any more.” A Please believed that “collaboration should be encouraged and rewarded.” (Collaboration should exist between instructors and students.)

All Out of Bubble Gum wrote, “Why [do] poorly reviewed instructors never improve?” These statements reflect that these participants expect instructors to meet a minimum standard before these participants are inclined to learn from these instructors.

Blue Sky Research was concerned about the ways in which the university as a whole was being run. He commented about “poor upper management” and that “I despise waste.” He expressed little confidence in the way he saw the university’s funds being spent. He wrote, “This university seems to favor appearance over actual quality of education.” Are these concerns valid? It does not matter. If this is the participant’s opinion, it can affect how this participant decides to learn, or whether or not to he decides to learn at all.

In KC’s interview he said that he believed that personal connections between student and teacher facilitate learning, and that it helps both parties to communicate personally and come to know each other to some degree. He believed knowing each other raises the comfort level and enhances learning. It is a sign that both parties care, but specifically that the teacher cares about the student. KC believed that comparing himself to others is a waste of time because of his personal experiences. He had an older brother who behaved horribly in school, so when KC came through he was immediately labeled as “one of those boys from that family.” (I had a similar experience. I was viewed as “academic,” while my younger brother was not. He was constantly told how he was not like his brother (me). That created as many learning issues for my brother as it did for
KC, or rather the teacher’s reactions to KC. The teacher’s behavior in this respect did not foster learning.) KC believed that constant comparison leads any person to eventually feel inadequate. ∞ expressed similar views. Interaction with the instructor was supported with comments like, “I like to talk to people and learn about them. . . . I really like to interact with my instructors” (KC).

The participants expressed a deep concern, albeit indirect, about learning. If instructors offer the support and scaffolding these participants seem to need, the probability of these participants being successful increases. The key for these participants is their willingness to learn in reaction to how they perceive the instructor and how well they feel they interact with the instructor. Their focus is on their relationship with the instructor. For this reason I labeled this group, Factor 2, “Not Self-directed.” These participants are open to support and if it is given, they are inclined to try to learn. Of course, support is defined by the participants, be it reasonable or not from the instructor’s standpoint of view. “Support” can range from occasional clarifications to making the course “easy,” from “helpful hints” to solving problems for students. Some students truly wish to learn and some want to fill in the blanks and move on.

**Factor 3** (Table 10): Heisenberg, Derek Zoolander, Anheuser and Stan loaded on Factor 3. Stan is a member of the core group. This factor is bipolar. Heiseberg and Stan are in alignment with the positive, most true (+) statements of factor 3, and Derek Zoolander and Anheuser are in alignment with the negative, least true (-) statements of factor 3. This is indicated by the negative loadings as listed under factor 3.
These data made more sense if rearranged so that the negative selections lined up with their positive counterparts as shown in Table 11. This rearrangement more clearly showed that although this factor is bi-polar, the participants are taking opposite views of the same themes: how these students feel they learn, how information is received by these students, what these students want from instructors, and a personal focus.

These students seemed to be sensitive to the interactions with and the behavior of the instructor, so I call this factor or group “Sensitive to Presentation.” Heisenberg and Stan needed to enjoy what they learn; they feel inadequate if they do not grasp concepts as easily as the people around them, and they react negatively to learning if they feel they are not “measuring up.” They compared themselves to others. Heisenberg and Stan expressed fixed mindsets in that they suffer from face threat. They do not like being penalized for mistakes. Learning is understanding, not just memorizing. They prefer to compartmentalize information first and then pull it together as a whole later. They believe that the instructor should be passionate about teaching.

Derek Zoolander and Anheuser do not like “book” pushers. (Many students have expressed to me that they do not want to buy any more books than they absolutely need.) They do not like learning without an obvious real-world application and they do not like “canned” PowerPoint presentations. They prefer presentations that do not seem like a form of media, i.e., informational, but personal. Derek Zoolander and Anheuser felt that learning takes place outside as well as inside the classroom. They preferred that the instructor care more about students than maintaining the course schedule and considered...
Table 10

Factor 3 – Raw Data Outputs of PQMethod Program

<table>
<thead>
<tr>
<th>Stmt Nbr</th>
<th>Statement</th>
<th>Mod Nbr</th>
<th>Stmt Nbr</th>
<th>Statement</th>
<th>Mod Nbr</th>
</tr>
</thead>
<tbody>
<tr>
<td>12*</td>
<td>I need to enjoy what I learn and the career I select.</td>
<td>48</td>
<td>11*</td>
<td>I don’t like instructors that are book pushers (insisting that students buy a large number of books, many of which are hardly used).</td>
<td>43</td>
</tr>
<tr>
<td>29*</td>
<td>I feel bad when I am not grasping things as quickly as the people around me.</td>
<td>36</td>
<td>6*</td>
<td>I don’t like to learn if I don’t see a real-world application.</td>
<td>20</td>
</tr>
<tr>
<td>1</td>
<td>Learning is understanding and comprehending concepts, not just memorizing.</td>
<td>1</td>
<td>28*</td>
<td>Presenting with Powerpoint, page after page, becomes boring and impairs learning.</td>
<td>28</td>
</tr>
<tr>
<td>2*</td>
<td>Information as a whole is important, but it’s a second step. You have to understand the parts first.</td>
<td>8</td>
<td>49*</td>
<td>The instructor’s presentations should not seem like a form of media.</td>
<td>31</td>
</tr>
<tr>
<td>32</td>
<td>The instructor should be passionate about what he/she teaches.</td>
<td>51</td>
<td>48*</td>
<td>Learning results from inputs of information from both in and out of class.</td>
<td>25</td>
</tr>
</tbody>
</table>
Table 10

Factor 3 Raw Data Outputs of PQMethod Program (continued)

| Additional distinguished statements – statements unique to this factor |
|---|---|---|---|
| 50* | Society ties our learning and education too closely to our worth as a person. | 42 | 23* | Learning is gradual over time. | 49 |
| 13* | We are penalized for making mistakes. That impacts how I learn. | 50 | 15* | Continuity is very important. | 9 |
| 20* | I compare myself to others. | 35 | 37* | I am discouraged when the instructor treats me as if I’m inadequate or is disrespectful. | 37 |

(* indicates distinguished statements)

continuity to be important when presenting the course material. They felt discouraged when they felt as if the instructor treated them as inadequate or disrespectfully. This is also a face threat issue, but between the student and the instructor, not between the student and other students.

This factor has both positive and negative face threat issues with a heavy emphasis on the role of the instructor and his/her teaching methods. *Heiseberg* and *Stan* had face threat issues with other students and tended to compartmentalize information.
Table 11

Factor 3 Raw Data Outputs of PQMethod Program – Positive Polarity Compared Directly With Reversed Negative Polarity

<table>
<thead>
<tr>
<th>Positive (+)</th>
<th>Negative (-)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stmt Nbr</td>
<td>Statement</td>
</tr>
<tr>
<td>12*</td>
<td>I need to enjoy what I learn and the career I select.</td>
</tr>
<tr>
<td>29*</td>
<td>I feel bad when I am not grasping things as quickly as the people around me.</td>
</tr>
<tr>
<td>1</td>
<td>Learning is understanding and comprehending concepts, not just memorizing.</td>
</tr>
<tr>
<td>2*</td>
<td>Information as a whole is important, but it’s a second step. You have to understand the parts first.</td>
</tr>
<tr>
<td>32</td>
<td>The instructor should be passionate about what he/she teaches.</td>
</tr>
</tbody>
</table>
They seemed to be directed more inwardly. *Zoolander* and *Anheuser* had face threat issues with the instructor and believed that learning results from experiences both inside and outside the classroom. They seemed to be more affected by external issues. All four participants preferred instructors who care. All four participants were sensitive to the instructor’s actions and attitudes, and his or her modes of presentation.

*Heisenberg* commented that “if you love what you do, then you will find a way to overcome.” “Everyone learns differently.” *Stan* revealed “I was home schooled most of my life learning on my own terms, so at times I feel very uncomfortable in school.” Not interacting in a classroom environment earlier may account for Stan’s views on enjoyment and how he feels when he compares himself to other students. “Everyone learns differently. I learn differently from my friends, family, and co-workers.” *Derek Zoolander* wrote, “Different perspectives from instructors allow me to decide which way of receiving information is most helpful in my learning process.” He implied that Powerpoint could be “okay,” but not if it is overdone. “Organized classroom learning is a good way to present material.” He was also concerned about the “inconsistency in the quality of instructors.”

These participants showed a high degree of sensitivity and that sensitivity supports or hinders their willingness to learn depending on how they view the instructor and the learning environment. “I can learn if . . .” These participants lacked confidence to a degree and seemed to be unsure about how they should proceed. There was a wide mixture of expressions.
Confounded participants loaded on two or more factors. Fred and Beer Lover loaded pretty evenly on two factors, 1 and 3. Ron White loaded evenly on all three factors. There was no stock evaluation of confounded loadings from a Q method standpoint, but the comments of these participants were informative.

Fred commented that, “I was home schooled so I’m used to learning on my own without much direction from an instructor.” I have noticed that home-schooled students are less comfortable in a classroom environment. Suddenly they cannot do whatever they want and they find the restrictions of the classroom annoying. Stan had the same issues. Fred believed strongly in “hands-on” learning (physical activity). “I am all about hands-on. It’s my life ambition to become a service engineer.” (In many circles engineering and engineering technology are viewed as interchangeable although they are not.) Beer Lover opened with, “It was very hard to be here when the instructor doesn’t care.” “He makes you understand more and remember it.” Beer Lover, similar to Blue Sky Research, thought that “the classes stay the same. Zero budget equals zero improvements.” Ron White believed that respect for others in the classroom and positive attitudes lead to positive learning results. “School is tough. You have to want higher education.” Ron White felt that he learns best with hands-on approaches. Although Fred, Beer Lover, and Ron White loaded on no single factor, they expressed many of the views of those who did.
Observations of Interest

Although there are differences between the three factors, there are some common themes. A recurring theme focused on Powerpoint presentations, from “Powerpoint teaching sucks” (*George Washington*) to “I was able to think of it in sort of a different way and had the opportunity to take more time . . . with Powerpoint. I liked it more than I ever had in the past” (*Stan*). Is it that Powerpoint presentations are always poor, or is it the way Powerpoint is used that determines whether or not Powerpoint presentations are effective? *Beer Lover* possibly shed light on this possibility. “Too many times the instructor used someone else’s Powerpoint [presentation] and viewed it with us for the first time.” I believe that students view Powerpoint as a tool that does no more than augment teaching. It seems that in these participants’ eyes the most effective way to use Powerpoint is to present a few slides with deep explanations as opposed to many slides with little or no explanation. Most of all students dislike instructors who read the slide to them word for word.

Statement 1, “Learning is understanding and comprehending concepts, not just memorizing” was within the top five “most true” statements for factors 1 and 3, and was a distinguishing statement for factor 2 (the ninth statement, +). Students’ recognition that rote memorization is not necessarily learning or that grades do not necessarily reflect that something has been learned was expressed in all three factors in different ways. Regardless of what the students’ viewpoints may be the majority of students seemed to recognize learning versus not-learning. To various degrees they have learning expectations of themselves and teaching expectations of the instructor.
There is a clear distinction between those who take responsibility of learning (factor 1) and those who expect the instructor to take partial responsibility for their learning (factors 2 and 3). These attitudes seem to hinge on how students process or fail to process mistakes and how deeply students feel affected by the actions (or lack of actions) of the instructor. All students seemed to feel all of these things, but the focus was different for these two groups. The participants of factor 1 focused on problem solving and processing mistakes. The participants of factors 2 and 3 focused on their interactions with the instructor. None of these categorizations are absolute. They are trends.

Table 12 shows the consensus statements, those statements on which all participants generally agree. (Plus and minus 2 can be interpreted as mildly important or not important.) Everyone (the participants) seemed to be mildly disinterested in visual presentations but found it mildly important that instructors care and that the intermediate steps of solving a problem be explained in detail. These preferences were expressed to a greater degree by means of other statements in some of the factors.
Table 12

Consensus Statements: Statements That Do Not Distinguish Between Any Two Factors

<table>
<thead>
<tr>
<th>Nbr</th>
<th>Statement</th>
<th>Avg Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>I would like to see more visual reviews of material to augment classroom presentations. Helps me to find “where I lost it.” (26) E/M</td>
<td>-2.00</td>
</tr>
<tr>
<td>9</td>
<td>If the instructor does not care, it becomes harder to learn. (34) PS</td>
<td>+2.33</td>
</tr>
<tr>
<td>41</td>
<td>I learn best when the instructor shows the reasons for the intermediate steps not just the outcome. (12) E/M</td>
<td>+2.33</td>
</tr>
</tbody>
</table>
CHAPTER VI

WHAT DOES THIS MEAN?

Those that hear not the music think the dancers mad.\(^5\)

Friedrich Nietzsche (1844-1900)

So what can be concluded as a result of this study?

- This study is in agreement with Kohl’s (1994) observation pertaining to students’ performance. Poor scholastic performance should not be immediately interpreted as an inability to learn. A student for one reason or another may not have made the decision to learn or may simply be trying to determine how to negotiate what seems to be a completely alien landscape of information.

- Students’ willingness or unwillingness to learn should not be prejudged.

Within the factor statements, within the participants’ comments, and within

\(^5\) This is the commonly accepted version of the quote, but the “correct” version is “And those who were seen dancing were thought to be insane by those who could not hear the music.” However, although this is commonly accepted as being said or written by Nietzsche no one has identified the exact work from which it was quoted. It seems to have just “appeared.” In 1814 an excerpt was printed in “The Universal Magazine.” Madame Anne Louise Germaine de Staël wrote, “... sometimes even in the habitual course of life, the reality of this world disappears all at once, and we feel ourselves in the middle of its interests as we should at a ball, where we did not hear the music; the dancing that we saw there would appear insane (italics added).” Madame de Staël should probably receive the credit for the quote.
the interviews not one participant of this study expressed no interest in
learning or any intent to deliberately refuse to learn although each learner had
conditions and expectations. All groups of participants expressed a “deeper”
understanding of learning by including statement 1 prominently: “Learning is
understanding and comprehending concepts, not just memorizing.”

• The participants, engineering technology students, expressed three main types
of attitudes, beliefs, opinions, and feelings about learning in a classroom
environment. I have entitled them self-directed, not self-directed, and sensitive
to presentation.

• Epistemological beliefs and mindsets (Dweck, 1988; Schommer, 1998)
provided a solid base for an assent-to-learn model. All three factors have an
epistemological belief-mindset component. (See Venn diagrams in Table 13.)

• The third factor, Sensitive to Presentation, emphasizes that students can be
very inspired or discouraged by the manner and presentation of the instructor.
This theme is present within the other two factors to a lesser degree and
deserves the full attention of any instructor. We (instructors) have to be
sensitive to the effects we have on our students regardless of how good our
intentions are.
Table 13

Summary of Factors, Most True (+)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Venn Diagram</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factor 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Self-directed</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E/M - Ability (4)</td>
<td></td>
<td><strong>Main theme</strong>: Processing and learning from mistakes (growth mindset).</td>
</tr>
<tr>
<td>AL - Practical</td>
<td></td>
<td>• Needs experience, not just lectures to enhance learning (practical).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Understanding and comprehension means more than just memorizing (growth mindset).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Needs to feel that the instructor is knowledgeable (source).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Classroom environment and comparison to others are not important.</td>
</tr>
<tr>
<td><strong>Factor 2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Not Self-directed</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E/M - Structure</td>
<td></td>
<td><strong>Main theme</strong>: Needs step-by-step approach to learning, starting with basic concepts and building up to the more complex (structure).</td>
</tr>
<tr>
<td>E/M - Ability</td>
<td></td>
<td>• Does not like boring formatted presentations (referential). (no Powerpoint, please.)</td>
</tr>
<tr>
<td>MR - Referential</td>
<td></td>
<td>• Learns best when test problems and homework problems are exactly alike. (fixed mindset).</td>
</tr>
<tr>
<td>PS - Freedom</td>
<td></td>
<td>• Prefers instructors that care more about students than maintaining the course schedule (freedom).</td>
</tr>
<tr>
<td>PS - Face threat</td>
<td></td>
<td>• Learns better when feeling successful (face threat).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Cultural concerns, comparison to others and learning comfort are not important.</td>
</tr>
</tbody>
</table>
Table 13
Summary of Factors, Most True (+) (continued)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Venn Diagram</th>
<th>Summary</th>
</tr>
</thead>
</table>
| **Factor 3**<br><i>Sensitive to Presentation</i><br>(+)
| PS - Freedom<br>PS - Face threat<br>PS - Dom/Compliance<br>E/M - Ability<br>O - Passion (instructor) | ![Venn Diagram](image) | **Main theme:** Sensitive to the presentation of information and impressions given by the instructor.
**(+)** positive polarity
- Needs enjoyment when learning (freedom).
- Feels bad when not grasping things as well as others in the class are (face threat).
- Learning is understanding, not just memorizing (growth mindset).
- Prefers to understand the parts first, then the whole (structure).
- The instructor should be passionate about teaching (other).

| (-) PS - Dom/Compliance<br>AL - Practical<br>AL - Self-direction<br>MR – Referential (2) | ![Venn Diagram](image) | **(-)** negative polarity
- Do not like "book pushers" (dominance/compliance).
- Do not like learning without seeing a real world application (practical).
- Presentations should not be "canned"—standardized; no Powerpoint, please (referential mode of reception)
- Learning includes inputs from both inside and outside of the classroom (self-direction).
- Discouraged when instructor treats student as inadequate or disrespectfully (face threat)
• This assent-to-learn model is effective, but not all-inclusive. For example, Number 10’s expression of religion which was not a part of this assent-to-learn model. The model could have been adjusted to include religion and to accommodate religious participants in the study.

A tabular and graphical (Venn diagram) summary of each factor is shown in Table 13. The summary shows the highest-ranking aspects of each factor, assuming that most students focus more on what they want rather than what they do not. Factor loading for factors 1 and 2 are almost evenly split, 10 and 9 respectively. Only four loaded on factor 3, two with one polarity and two with the opposite polarity. The Venn diagrams and the listed model categories show what part of the assent-to-learn model was emphasized and most important to each factor. Mindsets are included and prove to be mixed. The following abbreviations are used in Table 13 to indicate category on the Venn diagrams in Figure 3. E/M - Epistemological Beliefs/Mindsets, AL - Adult Learning, MR - Modes of Reception, PS - Preservation of Self, and O - Other.

**Discussion**

Students cannot be evaluated as substandard because they do not respond as we believe that good students should as pointed out by Kohl (1994). Students usually do not begin with not-learning (Kohl, 1994). Students begin by trying to figure out how they, the students, will approach learning and whether or not they believe they can learn the material at hand. What is interpreted so many times as indifference is actually the student’s uncertainty and confusion. How do we approach something we have never seen
before, especially if we have nothing familiar with which to relate it? How will I learn it? Should I learn it? Can the instructor help me? How in the world will I use this? This is an opportunity for the instructor to step in, try to ferret out what the concerns are, and then help to address these concerns. As Kohl (1994) pointed out even difficult students can respond positively with a little help.

As hooks (1994) explained, the worst thing an instructor can do is forge ahead attempting to overpower students. “More than any other class I had taught, this one compelled me to abandon the sense that the professor could, by sheer strength of will and desire, make the classroom an exciting, learning community” (hooks, 1994, p. 9). Students are vessels full of their thoughts, dreams, ideas, goals, and attitudes, and that has to be included in the teaching equation. When we ask to put something in a student’s mind (teaching), that student is assessing what he or she is willing to take out or lower in priority to make “room” for what we offer. The student may decide not to make room for it. Instructors have to allow students to make these decisions without undue pressure and timelines.

The participants of this study were grouped into three categories or factors. (Factoring as used as part of the Q method is a means of grouping.) The first group focused heavily on epistemological beliefs with mostly growth mindsets (Dweck, 1988, 2006; Schommer, 1998). This group of participants believed that processing mistakes was a part of learning, i.e., these students expressed no fear of making mistakes; these students believed that they learn through their mistakes. These participants strive to understand processes as applied to many situations, not just the situation at hand. These
students want to learn to fish, not be given a fish. These students expect their instructors to be knowledgeable.

The students of group one were concerned with experiencing as part of the learning process, or doing as a part of learning (Knowles et al., 2005). The students did not express face-threat concerns or concerns with the general learning environment. Participants (students) who were interviewed focused on processing mistakes and learning from them but also commented on preferring a personal relationship with the instructor. Overall these students were straightforward, confident, not dependent on the instructor, and focused on “getting it done.” This is why I labeled this group Self-directed. These students had developed independent learning strategies, which were definitely true of the three core participants that loaded on this factor.

The second group of participants depended more on the interactions between themselves and instructors. What these students decide to learn and how they decide to learn depends on their perceptions of the instructors. These students focused on what the instructor should do to facilitate their learning, and this is why I entitled this group as Not Self-directed. The students of group two follow rather than lead. These students expected the instructor to start with basic concepts and then build to more complicated ones, step-by-step without any discontinuities. The students of this group viewed Powerpoint presentations as generally boring. The students expected the instructor to be more concerned with students than with the course schedule. These students felt that they learn best when test problems are exactly like the homework problems (remembering end results rather than learning the underlying concepts; accepting fish instead of learning
how to fish) and they felt that they learn better when experiencing success. These students were willing to argue for points (grade points) instead of learning from mistakes, but were not concerned with general classroom conditions, society’s views of learning, or cultural issues in general. These participants react rather than act.

There is nothing wrong with these students or their viewpoints, but they indicate a focus that is shifted to the instructor. These participants took less responsibility for their learning than those in the first group, *Self-Directed.* If the students of the second group do not learn, they view it as the instructors fault. “I could have done better if . . .” The one core participant of this group did express a sense of responsibility but was highly focused on his personal relationship with the instructor. He, this core participant, felt that knowing the instructor as a person enhances learning. (This could have been a personal view of his relationship with me. He had just successfully completed a course with me, but he felt that I should have been more available.) Regardless, the focus is with the instructor, how the instructor acts and reacts, and how the student feels he or she is affected by the instructor.

Care must be taken, in this case by the researcher, not to jump to false conclusions. Nothing in the data indicates that the first group is good and the second group is bad. The first group, *Self-Directed,* could easily be full of expert hoop-jumpers or not-learners (Kohl, 1994). “Let me get this done so that I can just move on.” A year from now the first group of participants may demonstrate that they have learned very little. It can only be said that these students have strong strategies for meeting the requirements of the course or satisfying the requests of the instructor. The second group
of participants, *Not Self-Directed*, may have been implicitly taught that hand holding is what good instructors do—an implicit curriculum within their previous education (Eisner, 1979). With effective directions from the instructor these participants could easily become good learners. The data of this study must be taken at face value. Students do not always see an indication of what a fact means within the scope of what is being taught. The traits that were expressed by the participants of each group were observable and recordable, but the source of these traits seemed to be illusive in some cases (Stephenson, 1979, 1980). Using these data as a guide the instructor will still have to determine “what’s what” on a person-by-person basis working from the observations at hand. Factual observations provide more information about these participants than would have been obtained without the study. Both groups can contain good learners and it helps to have an organized approach for reaching them.

The third group of participants seems to be conflicted at first glance. This is a bipolar factor with two participants expressing the exact opposite points of view of the other two participants. Both polarities express both fixed and growth mindsets. Similar to the second group they expressed a dependence on the actions of the instructor, but with a heightened sensitivity. By rearranging the negative statements to align with the positive statements (Table 11) a clearer picture emerges that shows that the participants are taking different views of the same themes: how these students feel they learn, how information is received by these students, what these students want from instructors, and personal focus. These participants are not confused. They are strongly influenced by the instructor’s presentation style and attitude toward them as students. I labeled this group
Sensitive to Presentation. The participants of the positive polarity are internally focused and focused on the personal while those of the opposite polarity are outwardly focused and seem to focused more on the impersonal.

A core participant loaded on the positive polarity. He was home schooled and admitted that he was somewhat uncomfortable in a classroom setting and missed the freedom of being able to learn however he chose. He found instructors somewhat limiting. Conversely he also expected a fair amount of direct support from the instructor. This is an example of what I mean by “conflicting.” He wants independence, but he wants to be supported. It is interesting that this factor contained more distinguished statements in the top five plus and top five minus rankings of any of the factors (see Table 10, distinguished statements indicated by *), 8 of 10 statements. These participants may have had mixed viewpoints, but they were very consistent about them.

The third factor or group strongly and clearly exhibited the need of some students to connect with their instructors. This group expressed their sensitivity to presentation as a priority, but the same theme was expressed by the other two groups as well, albeit to a lesser degree. Teaching and learning are human activities accompanied by a need for human contact, consideration, and support. Although professional distance should be maintained in teaching-learning relationships, friendliness, sensitivity, and caring have to be present also (Noddings, 2002). The third group provides a clear reminder of this simple fact: teachers have to care.

Although the three factors or groups were distinct, there were also points of agreement. As shown in Table 12, all of the participants generally agreed that students do
not feel that they need more visual reviews. Students do feel that it is harder to learn if they sense that the instructor does not care. Students need to see the reasons for and the intermediate steps that lead to an outcome. All three factors (groups) included statement 1, “Learning is understanding and comprehending concepts, not just memorizing” in their top choices. The three groups expressed the need to see the usefulness of what is being learned. These viewpoints reflect positive views of learning and of things these participants feel they have to do to learn. Again, these are no bad students.

**The Assent-to-Learn Model**

The assent-to-learn model was adjusted to fit the concourse, so effectiveness was designed into the process. Epistemological beliefs and mindsets seem to provide an effective core, but the other categories are necessary to gather a more complete picture. It is more effective to develop what Schommer-Aikins (2004) referred to as an embedded model—a model consisting of combined models. Preservation of self is probably the next most effective addition because it allows the most versatility and contains the participants personal concerns. This category includes face threat, domination and compliance (power), freedom—personal and academic— and cultural sensitivity. It also could have included racism, sexism, homophobia, religion, political views, trust, and any number of other categories depending on the research question(s) and the participants. Adult learning was added because the participants were adults (Knowles, 1968; Knowles et al., 2005), and the modes of reception category was added based on the possibility that teaching is performative (Butler, 1998; hooks, 1994), so learning could be affected by
how students receive the message (lecture or presentation) as media (Michelle, 2007; Zenor, 2012).

The assent-to-learn model is intended to be flexible and applicable. What if half the class had been female? Then the need to include sexism may have been more pronounced. What if most of the class had been openly Christian or Muslim? The religious views of a topic may have been included to see how they affected the participants’ willingness to learn that topic. A “born again” Christian may reject Darwin’s theories out of hand regardless of how effectively the topic is taught. Although I am presenting the advantages of a flexible model, it is also true this model reflects my personal views. I personally believe that fixed models are to be avoided. Before I return to currere I need to ask where I would have fit compared to the participants in this study.

**Where Do I Fit?**

“Where do I fit” is a difficult question to answer. Is “fitting” in reference to me now or me then? For the time being I think the most direct approach is evaluate a comparison to me now. The students who participated in this study are now. It can be argued that I have far more educational experience, but it can also be argued that I have many of the same concerns and questions that my students have. In my opinion one of the tricky things about currere is that we always evaluate from “now” whether or not we accurately remember the past or visualize the future. Much of what I remember is now, just as my view of the future is now. I see no conflict in comparing myself to my students now. The students’ “now” also includes their pasts and futures.
On what factor would I load? This can be closely estimated but not directly determined because the Q method compares variances, not adherences to a mean. If I add my Q sort to the existing set and reprocess the sorts, the results will be different because the added comparisons of variance between the other participants and I would cause shifts from the original result. So how can an approximate comparison made?

First I sorted the 52 statements then compared my +5, +4 and -5, -4 entries to those of the factors. My sort matched most closely to those of factor 1. Next I added my sort to the existing 26 participants, re-ran PQMethod, and tried to see if I could find a solution close to the current outputs. The first trial run placed me squarely on factor 1, but with changes in some of the other loadings. These changes occurred between factors 1 and 2 with one change between factor 3 and a confounded loading. I then forced my entry to load completely on factor 1 and evaluated the other loadings. The number of changes dropped to 3 between factors 1 and 2. The high- and low-ranking statements changed very little. Therefore, I concluded that I would load on factor 1 rather than on one of the other two factors.

Subjectively, I am more in agreement with factor 1 than with the other two. Is this how I viewed learning and teaching “then” or how I view it “now”? Since the current description of my learning experiences is based on my current interpretation of my memories, I have to say “now.” I am describing what I remember through the lens of my viewpoints as they exist now. I may or may not have had the same viewpoint at the time the event occurred. Now I am focused on growth mindsets, for me and for my students. I believe that correcting mistakes is an effective means of learning. How many mistakes
are made between the time a person first tries to play a musical instrument and the time he/she can play it well? Competence and proficiency are accomplished with practice, and practice includes the process of correcting mistakes. I believe that the degree of learning, or what has been learned, is best expressed by a person’s ability to show that which he/she can use and apply. I believe that learning is more meaningful when a clear purpose is at hand. I feel a stronger affinity with teachers that I deem to be knowledgeable and I believe I will learn more from them. I believe that the more open students are to new and unexpected experiences, the more they will learn. I believe I became a much better learner when I came to the conclusion that smart is relative at best if not outright illusive. No matter how much I know there is infinitely more that I do not know. This attitude allows me to relax, focus, and enjoy learning. Learning becomes the focus, with its frustrations, lumps, and all. I do all I can to help students see the advantages to this approach to learning.

It is ironic that to accomplish a relaxed and open attitude towards learning I had to sacrifice my focus on practicality. It has become all right to learn things that do not have an immediate use, or sometimes to learn something with no use at all. Who knows what the future will bring? I thought learning to type (use a typewriter) was one of the most useless things I had to learn. (It was a seventh grade class using mechanical typewriters.) But over the years I cannot think of any skill I have used more. I typed reports in college and later on at my jobs. At this moment in time I am entering these words with a keyboard. Is there anything such as useless knowledge, or does it just seem useless now?
The barrier or difference between my students and me is almost nil. I’m older, more experienced, more familiar with the subject matter I teach, and I have far more academic training than my students. However, many of my learning attitudes are or were the same as the students, including those of the participants of factors 2 and 3, not just factor 1. (For example, in general I do not like the way most people use Powerpoint.) Looking at my students is like looking into a mirror.

Return to Currere

I have little to add to my regressive. Again I am reminded how similar my students’ struggles are with mine. I wonder if these struggles are typical for all students or only the technically oriented? Schommer-Aikins, Duell, and Barker (2003) found little difference between disciplinary domains for undergraduate students using her (Schommer-Aikins’) epistemological belief survey. The 2003 study results may or may not extrapolate to the assent to learn, but based on the strong influence epistemological beliefs had in the assent-to-learn model it should not be surprising if it did.

The need for trust was reflected in some of participants’ comments although the topic was not addressed explicitly. For example, feeling that the instructor is knowledgeable is a trust issue (factor 1). Feeling that instructors should care is a trust issue (factor 2). Blue Sky Research believed that the university is poorly managed. He had no faith or trust in the administration of the university. I feel that trust is important because I need to trust that students are putting forth at least a minimal effort to learn. I
look closely at students’ efforts. I have noticed that generally as the semester progresses and trust builds, so does learning, or at least observable learning efforts.

Progressively, I think it is important to build understanding between students and instructors. Both seem to enter the classroom with ideas of “how things should be” only to find that the situation at hand is nothing like that which is expected. As a leader the instructor should help everyone to embrace the situation at hand. (Gently rather than severely seems to work better although some students need to be shocked or shaken.) My current understanding of engineering technology students has been influenced by the results of this study, and there are several things that I can definitely do to help students learn more effectively, and I believe I should do them, and I believe I should do them in an effort to perform more effectively as a teacher.

• Openly present mistakes as part of the learning process. I do this now to some degree, but currently engineering technology students seem to need more. That includes minimizing the “penalties” for mistakes. A please wonders, “If learning from your mistakes is optimal, why are points assessed before mistakes are fixed?” If mistakes are part of learning, the instructor has to make them affordable in the eyes of the student.

• Thoroughly explain problem solutions step-by-step and completely. It is easy to assume that students carry over what they have learned in previous courses. This may or may not be true, especially if the student has not learned his way through a previous course. The instructor should not skip steps because “you should know that.” (My most vivid memory of this approach was in an
engineering textbook. The problem solution given contained a huge gap from one point to another, followed by the rationale that it did not need to be covered because “this is intuitively obvious to the casual observer.” (I do not have the source, so treat this as paraphrasing. These words and the situation have stuck with me for life as an example of poor teaching.)

- Explain in detail the necessity, usefulness, and the need for the course content using “real world” applications as examples when I can. I emphasize those elements that I know will be used in the future. That which a student learns today will serve as the basis for what needs to be learned in the future in a building block sense. Also, no company asks for a grade point average after a student is permanently hired. All that matters after being hired is performance, and performance will possibly be poor if little has been learned.

- At a personal level, put more effort into appearing to be caring. It is not enough to be caring. A teacher must be perceived as caring. The Canadian teacher may have very well cared about Nokum’s grandson, but how would the grandson know unless it was expressed to him (Bouchard, 2006).

- Based on this study I believe these changes and improvements will address many of my students’ learning issues, along with simply being a nice, caring, supportive person. This has to be negotiated semester by semester. Being too nice can be disruptive (students avoiding tasks), but being nice enough helps. I believe taking the actions above will also foster trust.
Analytically I see a huge opportunity to create a comfortable subjective learning space within the classroom, for students and for me, based on the results of this study. This study has not introduced new ideas so much as it has forced me to review and to make corrective changes to my current teaching methods, especially in the classroom. My top priority is to focus more on caring. We are what we are, both the student and I. In conjunction with caring this has to be the starting point for everyone. Neither students nor instructors can effectively approach each other from the standpoint of what should be. Everyone has to accept that which is, that which exists. Personally, I see no horror in that. We need to look at the facts, which usually are our opinions and viewpoints when viewed subjectively, and at least try to ignore the values and connotations we are in the habit of placing on our opinions and viewpoints. Then usually situations and people do not seem as bad as they may first appear. For example, it is very important to recognize that the participants of this study are not good or bad. They are all reasonably honest students who have varying views of learning and of what is required to learn. As instructors we have to do what we can to dispel our biases and the students’ biases toward us. Strict instructors are not necessarily bad. Lenient instructors are not necessarily good. Drop the tendency to assign value and work to bring the best from everyone. And instructors have to lead this charge toward openness, reduced judgment, and shared experiences. It is before this backdrop that I would practice the items listed above under my progressive, i.e., present mistakes as part of the learning process, thoroughly explaining problems in detail, explaining the usefulness and necessity of the material being taught, and strive to be caring and supportive toward students in a more effective manner.
The Synthetical

For the synthetical I prefer to deviate slightly. *Currere* is a series of introspections. It focuses on self. But in this case my synthetical of past, present, and future will impact the students I teach, especially if I use this study to alter how I teach. In that light my synthetical also should include what I have learned from the participants of this study. I should include the participants’ (students’) opinions, not just mine. This also helps to balance the effects of my blind spots. There are always aspects of a person’s being, habits, and expressions of which he or she remains unaware until someone else points them out. Although the participants of this study responded in general, it would be narrow minded of me to think that some or many of these responses did not pertain to me directly. As I accept and include the results of this study more broadly, it becomes best for me to view this as *our* synthetical, not just my synthetical.

Again, when I look at my students I see reflections of myself. I see the same doubts and concerns that I had, and have, as a student. This belief on my part is reinforced by the fact that I was well aligned with an existing factor rather than implying a fourth factor independent of the other three. I also see developing learning strategies expressed among the students depending on the students’ confidence, acquired knowledge, and interests. It is within this infinite combination of opinions, feelings, thoughts, and concerns that the instructor must pull together strategies and actions that encourage learning. One size never fits all. There are no “silver bullets.” What works today or in this situation may fail miserably tomorrow or in another situation (hooks, 1994).
The instructor’s method must include trial and error as well as hard data as an effective means of evaluating students’ reactions. The trial and error process provides a feedback loop to inform the instructor of what is and what is not working. Instructors have to include abductive reasoning as well as assignment scores and other hard data. Not all circumstances can be reasoned. Passing does not always equal learning. Some teaching solutions will be the results of hunches, guesses, and raw intuition in response to what the instructor observes. Sometimes instructors have to be bold enough to move away from reasoning and training and simply react to the circumstance at hand as long as it is obvious that students are benefiting. Some instructors do this naturally. These people are called good teachers. The rest of us have to learn, or in most cases, unlearn, and work to grow as time passes. And we all have to care. I have to constantly ask, “How would I feel about this”? 

For me the synthetical is not a combination of the previous facts expressed in the regressive, progressive, and analytical. The synthetical is my reaction to it all plus the results of this study. The synthetical consists of how I plan to use the facts presented and gathered to this point in my life. My “take away” is that my teaching has to be flexible, inclusive (include the students’ feedback), and caring (sensitive to how students feel) in addition to meeting the standards of the course I am teaching. I have to include subjectivity, both the students’ and mine, as well as objectivity. I have to implement an effective implicit curriculum of caring about the future that complements the explicit curriculum reflected in the syllabus and textbooks (Eisner, 1979). Implicitly students should be taught that learning is not “this or that.” Learning is “this and that.” Learning is
non-linear, iterative, and abductive. Topics are inclusive and interconnected, not compartmentalized (Dweck, 2006; Schommer-Aiken, 1988).

I have to imply the worthiness of the teaching/learning process to the students as well as improve course content. At this time I would begin with the points discussed in my progressive (present mistakes as part of the learning process, thoroughly explain problems in detail, explain the usefulness and necessity of the material being taught, and strive to be caring and supportive toward students) with the understanding that these points may or may not apply with a new group of students. I can conduct additional surveys, discussions, and Q studies in an effort to better understand each group’s interests and concerns as time goes on. Implementing my progressive and monitoring students’ attitudes and feeling constitute my overall plan with details to be developed in situ along with the order of developing a concourse.

So Who Cares?

I think the question is, “Who should care”? And my answer is, “We all should.” I have witnessed hard, objective engineers study specifications and data for months to decide what car to buy only to make their final decision based on the styling or color or status of the car. Did we objectively vet our friends when we first met them, or were we subjectively attracted? How do most people decide which political candidate to vote for? As Bell (1996) observed, “All too many of those who do vote—swayed by appeals of their prejudices—vote against their interest” (p. 9). Most human decisions are made subjectively, or with significant subjectivity, but most professions focus on being as
objective as possible when making decisions. “This is our objective assessment.” Is it that people feel they have to justify and defend themselves and give good reasons for their decisions? Is objectivity a shield to help us hide our personal prejudices and biases? Is it that we do not want to take responsibility for our decisions and views in life? I do not know. I do know that subjectivity plays an important role in everyone’s life every day whether we wish to admit it or not. If it is true that subjectivity plays an important role in our lives, then we should openly include subjectivity to become more understanding, effective, and honest with ourselves and with others. To ignore subjectivity is to live with our heads in the sand.

One major issue has always been how do we define, evaluate, and discuss subjectivity without wandering off track? Stephenson’s (1953, 1980) definition of subjectivity solves the effects of wandering as far as existence goes and completely bypasses the “tributary emanating from some subterranean ‘stream of consciousness’” (Brown, 1980, p. 46). “A person’s subjectivity is merely his own point of view” (p. 46). By adhering to Brown’s definition of subjectivity there is no fear of confusion. Subjectivity has been objectified in that expressed subjectivity can be treated as objectively as numerical data (Smith, 2001). A person gives an opinion and that expression becomes a fact though its content may not be, and the reason for or the source of that expression can remain unknown and unidentifiable. So, now what reason do we have to try to exclude subjectivity from our daily decision making other than our subjectivity may be “wrong”? What grounds do any of us have to tell another person what to think or feel? Why not accept these expressions of subjectivity as data and
include them in our life processes since *we do it anyway*? If we openly include subjectivity, at least we can know what and why instead of insisting on something that really does not exist, such as pure objectivity. There is no “purely objective.” And there is no reason to exclude “subjective.” We all should care.

In addition, since 1935, we have had a direct means of evaluating human subjectivity, the Q method. A unique property of the Q method is that it was designed specifically to study human subjectivity by Stephenson, a man who understood both qualitative issues as a psychologist, and the quantitative issues as a physicist (Sloan, 1990; Stephenson, 1935, 1953). Can subjectivity be evaluated by other methods? Absolutely. Schommer-Aikins (2004) used purely statistical (quantitative) methods to study students’ epistemological views. On the other hand Dweck and Leggett (1988) and Dweck (2006) used purely qualitative method (observation of responses to a controlled situation) to study students’ subjective responses. Not only were their methods very effective, they strongly agreed even though their topics and methods were different. Any method is effective if used properly, and so is the Q method.

I prefer the Q method for this study because it allows participants to speak openly without being limited by my research interest. I am interested in the participants’ interests and opinions. The Q method does not force everyone towards a common, one-size-fits-all mean, and treat those that vary as deviants. Results are achieved through comparisons of the variances between the participants. Participants become the focus instead of sources of the focus. In fact the participants create the categories of interest. At the same time the Q method is mathematically structured which provides a repeatable order (not results) in
processing the data. The Q method allows the qualitative and the quantitative, the subjective and the objective to work in concert and bring about a clear understanding of what a group of participants is feeling and thinking at any given time about any given topic. The Q method takes advantage of our natural tendency to group ideas and thoughts and to share during the process. In this way the Q method emulates human behavior. I think that I am receiving more of the participants’ true feelings and thoughts than I would with only surveys or interviews alone. (Sometimes the participants are surprised at their own honesty.) I admit that my subjective response to Q was favorable from the beginning. To date, I have not seen, read, or heard any reason to change that position.

**Concerns**

In an imperfect world there is no reason to view the Q method as perfect. First and foremost, the Q method is only applicable when studying human subjectivity. It is not a statistical method *per se*. It is a method that uses statistics and not always in conventional ways. For example, the Q method can use factors that have single entries, and centroid factoring is an option as is manual rotation. No “pure” statistical system uses the centroid method to determine factors or allows the manual rotation of factors.

One of the most challenging parts of using the Q method is the formation of the Q sample. Are the statements diverse enough and comprehensive enough to cover the topic at hand and to allow for a wide range of viewpoints? When a Q study results in the dreaded one factor solution, the diversity of the Q sample and the diversity of the
participants are suspected first. The more diverse the Q sample and the participants, the richer the results of a Q study.

Although not-learning was implied by the participants as a possibility, not-learning was not discussed explicitly or even implied by the participants. There is still an open question as to whether or not students consciously non-learn, or if they identify any of their responses as an expression of not-learning. Do students delineate between learning and non-learning? Do all students not-learn or only adept students? I saw nothing in this study to strongly indicate that students do or do not consciously not-learn.

I do not have many concerns regarding the integrity of this research. I tried to address all of the concerns I was aware of when conducting this study, from ensuring that the students could openly express their voice to including my subjective biases and carefully applying the Q method.

What Next?

This study can proceed in any number of directions. Some directions that interest me are:

• Are these results typical for engineering technology students in general, i.e., if I repeat this study with a new group of engineering technology students and use the same Q sample, would the resulting factors be similar? If a new Q sample would be developed for a new group of participants, would the concourse and the results of the Q study be similar?
• Would the same group of participants hold the same views three to five years from now? (A longitudinal study.)

• Would the results of this type of study be different for students of other disciplines, i.e., participants across disciplinary domains?

• What is the best way to include other models: assume the form of the assent-to-learn model *a priori* and use it to drive the development of the concourse or develop the concourse first and then align and revise the assent-to-learn model to fit the concourse? Does it make a difference?

• Can the Q method be used as an evaluative process for each new class? The main concern is the possibility, or even probability that a “fixed” Q sample may not effectively apply to all classes. There is no assumption or expectation of generalizability, but sometimes there is enough overlap between groups to justify using a pre-developed Q sample. What are the conditions of this overlap?

• What are the attitudes of engineering technology students toward different topics, subjects, and classes?

• How would teachers respond to any of the topics expressed above? Do teachers consider subjectivity and the assent to learn when teaching and how? Would the results of group teaching participants be similar to the results of this study of student attitudes?

• I plan to explore and include trust and how it affects the assent to learn. The problem to date has been finding a researched study of trust. Most material
published on this topic relates to salesmanship and I do not wish to become a salesman. I want to develop the topic of trust as it pertains to a learning-teaching environment.

I plan to continue refining my understanding of subjectivity in learning. I will continue to refine my use of the Q method to study subjectivity.
REFERENCES


APPENDICES
APPENDIX A

IRB APPROVAL

NOTICE OF APPROVAL

September 11, 2013

Roland Arter
Curriculum and Instructional Studies
The University of Akron

From: Sharon McWhorter, IRB Administrator
Re: IRB Number 20130904 - "The assent to learn: An exploration of engineering technology students’ attitudes and beliefs towards learning in a classroom environment"

Thank you for submitting your IRB Application for Review of Research Involving Human Subjects for the referenced project. Your application was approved on September 11, 2013. Your protocol represents minimal risk to subjects and matches the following federal category for exemption:

☐ Exemption 1 - Research conducted in established or commonly accepted educational settings, involving normal educational practices.

☐ Exemption 2 - Research involving the use of educational tests, survey procedures, interview procedures, or observation of public behavior.

☐ Exemption 3 - Research involving the use of educational tests, survey procedures, interview procedures, or observation of public behavior not exempt under category 2, but subjects are elected or appointed public officials or candidates for public office.

☐ Exemption 4 - Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens.

☐ Exemption 5 - Research and demonstration projects conducted by or subject to the approval of department or agency heads, and which are designed to study, evaluate, or otherwise examine public programs or benefits.

☐ Exemption 6 - Taste and food quality evaluation and consumer acceptance studies.

Annual continuation applications are not required for exempt projects. If you make changes to the study's design or procedures that increase the risk to subjects or include activities that do not fall within the approved exemption category, please contact me to discuss whether or not a new application must be submitted. Any such changes or modifications must be reviewed and approved by the IRB prior to implementation.

Please retain this letter for your files. This office will hold your exemption application for a period of three years from the approval date. If you wish to continue this protocol beyond this period, you will need to submit another Exemption Request. If the research is being conducted for a master’s thesis or doctoral dissertation, the student must file a copy of this letter with the thesis or dissertation.

Approved consent form/s enclosed

Cc: Francis Broadway – Advisor
Cc: Valerie Callanan – IRB Chair

The University of Akron is an Equal Education and Employment Institution
APPENDIX B

PARTICIPANT CONSENT FORM

You are invited to participate in a study being conducted by Mr. R. Arter in Summit College of The University of Akron, Akron, OH.

This study is completely about your opinions, attitudes and viewpoints of learning in a classroom environment. If you decide to participate, you will be asked to develop a list of key points based on your inputs. A week or so later you will be asked to sort those statements from most important to most unimportant. You are not required to participate in both parts, although you are encouraged to do so.

Participation in the project is completely voluntary. If you agree to participate, you may refuse to answer any questions and may withdraw from the study at any time without penalty. If you are currently a student in my class your grade in the course is in no way contingent upon participation, and participation is not mandatory.

Your confidentiality will be protected throughout the study. No personal names will be used. Any data obtained from you during discussion and conversation, instruction and participating in the Q process will be kept confidential and will not be viewed by anyone but the researcher. Any identifying information collected or retained by me will be kept under lock and key and will not be shared with anyone.

There are no anticipated benefits or risks to you as a participant, aside from helping you and helping the researcher gain a better understanding of how and why students make the learning decisions.

If you have any questions about the research project, you can call Mr. Arter at 330-972-6784.

This research project has been reviewed and approved by The University of Akron Institutional Review Board for the Protection of Human Subjects. Questions about your rights as a research participant can be directed to Ms. Sharon McWhorter, Associate Director, Research Services, at 1-330-972-7666.

Thank you for your participation!

I consent to participate in this project:

Name __________________________ Date __________________________

[Signature]
APPENDIX C

REPRINT OF STEPHENSON’S 1935 LETTER TO NATURE MAGAZINE

On June 28, 1935, William Stephenson penned the following letter to the Editor of the British science journal Nature, thus initiating the development that has come to be known as Q methodology. The letter eventually appeared in the 24 August 1935 issue of Nature (p. 297), which was 77 years ago today.

Technique of Factor Analysis

Factor analysis is a subject upon which Prof. G. H. Thomson, Dr. Wm. Brown and others have frequently written letters to Nature. This analysis is concerned with a selected population of n individuals each of whom has been measured in m tests. The (m)(m-1)/2 intercorrelations for these m variables are subjected to either a Spearman or other factor analysis.

The technique, however, can also be inverted. We begin with a population of n different tests (or essays, pictures, traits or other measurable material), each of which is measured or scaled by m individuals. The (m)(m-1)/2 intercorrelations are then factorised in the usual way.

This inversion has interesting practical applications. It brings the factor technique from group and field work into the laboratory, and reaches into spheres of work hitherto untouched or not amendable to factorisation. It is especially valuable in experimental aesthetics and in educational psychology, no less than in pure psychology.

It allows a completely new series of studies to be made on the Spearman ’central intellective factor’ (g), and also allows tests to be made of the Two Factor Theorem under greatly improved experimental conditions. Data on these and other points are to be published in due course in the British Journal of Psychology.

W. Stephenson
Psychological Laboratory,
University College,
Gower Street,
June 28.
## APPENDIX D

### A SAMPLE Q SORT FORM

Code Name: ___________________________________ Date: ____________

Which statements best (or least) reflect your attitudes and beliefs about learning?

**Least true**

| 2 | 3 | 5 | 6 | 6 | 8 | 6 | 6 | 5 | 3 | 2 |

**Most true**

| -5 | -4 | -3 | -2 | -1 | 0 | +1 | +2 | +3 | +4 | +5 |

**Check:** Is each entry unique? (No double entries or skipped values, please.)
• What thoughts, opinions or feelings led you to select your +5 choices (most true)?

• What thoughts, opinions or feelings led you to select your -5 choices (least true)?

• How did you determine your 0 selections (neutral)?

• What other issues about your assent to learn came to mind as you filled in this form?

• Is there something additional that you think I should know to assist in my understanding of your answers?

• Is there any topic or statement that you feel should have been included or was missing from the list of statements?

• Did my presence influence any of your selections, and if so, how?

• Do you have any general comments or inputs?
APPENDIX E
THE CONCOURSE

- Learning is applying what we learn in class to a physical activity.
- Learning results from inputs of information from both in and out of class.
- Learning is understanding concepts.
- Learning is the understanding of fundamental building blocks before moving on.
- I don’t like to learn if I don’t see a real-world application.
- I don’t like to learn if I don’t see a reward.
- I expect to see something that leads to a financial gain.
- My learning is affected by how things are presented: for example, presenting with Powerpoint, page after page, becomes boring.
- My learning is affected by how things are presented: for example, reading from the book with no extra examples or inputs from the instructor.
- I want to see more in-depth explanations of how problems are solved.
- I want to know that what is offered has to do with money.
- Learning reflects comprehension.
- Learning reflects the ability to apply.
- If I cannot apply what I have learned, I haven’t learned it.
- Learning relates to other topics, it exhibits parallels between the content of many subjects.
- Learning is based on a building block approach.
- I don’t like the memorization associated with learning.
- General education, learning about various societies – how does memorization impact learning in this respect.
- Learning of other cultures is important.
- I have to accept the existence of my cultural bias, and do my best to keep it low, down, “toleranced.”
- I have to accept my personal biases.
- Education as learning – A structured process in a building.
- It is important to get along with other people.
- Regard for other people is important.
- Information as a whole is important, but it’s a second step. You have to understand the parts first.
- Learning can be uncomfortable.
• Learning can be challenging.
• Learning *about* exercising, but never exercising is not learning.
• Working in classroom “kicks it out.” It detracts from what is actually going on in a real-world sense.
• I want to see “with my fingers,” not just with my eyes.
• Learning is like job satisfaction: If I feel satisfied with my boss or instructor and I feel like I am succeeding, then it is easier to learn.
• If the boss or instructor does not care, it becomes harder to learn.
• If an instructor seems to make me feel small or disrespected it hurts my willingness to learn.
• Does it make sense to argue about homework or test points instead of using that time to learn more?
• If I feel something should be done a certain way and the book recommends another way, I follow the book to reduce the chance of making a mistake and losing points.
• Mistakes are part of the learning process.
• We are penalized for making mistakes.
• Resolving mistakes and problems “sets” the information in my mind.
• I learn more if the instructor is approachability.
• I don’t learn much from instructors that seem to feel that they are above us students.
• I’ll give the instructor the respect he/she gives me.
• Low accessibility to the instructor impairs my learning.
• Instructors do not seem to collaborate so that the content of one course flows into the other courses of the curriculum.
• Continuity is very important.
• Learning is gradual over time.
• If the material is not being received after a point, the instructor should go back and review.
• In a classroom setting instructors cannot compensate too much for “poor” students without penalizing the “good” students.
• I would like to see more Penopto presentations to augment classroom presentations – visual review of material. Helps to find “where I lost it.”
• I like to receive information in different ways from difference perspectives.
• I would like see Penopto set up as a brief summary review.
• Is using new presentation technologies in the classroom “cheating”?
• I want to see the steps of a process, not just the inputs and outputs.
• Societal influences impact learning and education. I compare myself to others.
• Society ties our learning and education too closely to our worth as a person.
• I don’t like studying things I really do not want to learn, especially when I don’t see the value of the material.
• I need to enjoy what I learn and the career I select.
• I feel bad when I am not grasping things as quickly as the people around me.
• I am discouraged when the instructor treats me as if I’m inadequate.
• People don’t know how to communicate with each other.
• Humor, history, practicality makes for a good presentation from an instructor.
• I don’t like instructors that are book pushers (insisting on students buying a large number of books).
• Instructors that consistently catch students’ interests are better teachers.
• The instructor should be passionate about what he/she teaches.
• The instructor’s should not seem like a form of media.
• The instructor should want to be with students.
• I learn best when the instructor can present the same info in different ways.
• I learn best when the instructor shows the reasons for the intermediate steps not just the outcome.
• I learn best when the instructor understands the material.
• I learn best when the instructor starting from a basic concept and move towards an advanced concept
• I learn best when the example problems should be similar to the homework problems.
• I learn best when other sources of information about the topic being taught are added in addition to the textbook.
• I learn best when the instructor is not concerned with the dates on the syllabus but how the students are learning
• I learn best when I see the purpose of doing something.
• I learn best when understanding the information rather than memorizing it.
• I learn best when working in sequence instead of jumping around (I do best when a topic is fully covered, then move to another topic, then come back to the original topic).
APPENDIX F

THE CONCOURSE STATEMENTS, MAPPED INTO THE
ASSENT-TO-LEARN MODEL

Epistemological Beliefs/Mindsets

*Ability to learn (determined at birth to develops over time)*

1. Learning is understanding and comprehending concepts, not just memorizing. (1)
2. Learning can be uncomfortable. (14)
3. Learning can be challenging. (24)
4. Mistakes are part of the learning process. (33)
5. Resolving mistakes and problems “sets” the information in my mind. (40)
6. I learn best when the homework and test problems are exactly like the example problems covered in class. (46)
7. It does not make sense to argue about homework or test points instead of using that time to learn more? (51)

*Structure of knowledge (compartmentalized to integrated)*

8. Information as a whole is important, but it’s a second step. You have to understand the parts first. (2)
9. Continuity is very important. (15)
10. I want to see more in-depth explanations of how problems are solved. (25)
11. Learning relates to other topics and exhibits parallels between the content of more than one subject. (34)
12. I learn best when the instructor shows the reasons for the intermediate steps not just the outcome. (41)
13. The instructor should start with basic concepts and progress in sequence to more complex topics without jumping around. (47)

*Stability of knowledge (absolute to evolving)*

14. I learn best when other sources of information about the topic being taught are added in addition to that of the textbook. (3)

*Source of knowledge (expert to experiential)*

15. I learn best when the instructor understands the material. (16)

*Speed of learning (quick learning)*

16. Learning is gradual over time. (26)
Adult Learning (Andragogy)

Usefulness/needs
17. I don’t like to learn if I don’t see a meaningful result, purpose or value. (4)
18. Working in classroom “kills learning out.” It detracts from what is actually going on in a real-world sense. (35)

Practical application
19. Learning should focus on applying what we learn in class to a physical activity. (5)
20. I don’t like to learn if I don’t see a real-world application. (6)
21. Learning reflects the ability to apply. (17)
22. Learning about exercising, but never exercising is not learning. (27)
23. I want to see “with my fingers,” not just with my eyes. (42)

Self-direction
24. Low accessibility to the instructor impairs my learning. (7)
25. Learning results from inputs of information from both in and out of class. (48)

Modes of Reception (learning as reception of a message)

Transparent (accept presentation as-is)
• None: No student expressed accepting anything as-is.

Referential (compare presentation to own experience and personal views)
26. I would like to see more visual reviews of material to augment classroom presentations. Helps me to find “where I lost it.” (8)
27. Using new presentation technologies in the classroom is “lazy” teaching. (18)
28. Presenting with Powerpoint, page after page, becomes boring and impairs learning. (28)
29. Reading directly from a textbook with no extra examples or inputs from the instructor. (36)
30. Humor, history, practicality makes for a good presentation from an instructor. (43)
31. The instructor’s presentations should not seem like a form of media. (49)
32. I like to receive information in different ways from difference perspectives. (52)

Mediated (interpret presentation based on own skills and preferences)
• None: From a learning standpoint of view mediated reception seemed absent.
Most students do not have a formal teaching reference

Discursive (analyze meaning and value of presentation)
33. Good instructors collaborate so that they can present content that aligns with the content of other courses in the program. (19)

Preservation of Self

“Face threat”
34. If the instructor does not care, it becomes harder to learn. (9)
35. I compare myself to others. (20)
36. I feel bad when I am not grasping things as quickly as the people around me. (29)
37. I am discouraged when the instructor treats me as if I’m inadequate or is disrespectful. (37)
38. I learn better if I feel I am succeeding at it. (44)

*Cultural sensitivity (expressed the need, but no firm practices or experiences)*

39. Learning of other cultures is important. (10)
40. I have to accept the existence of my cultural and personal biases, and do my best to keep it low, down, “toleranced.” (21)
41. It is important to get along with other people and regard them as important. (30)
42. Society ties our learning and education too closely to our worth as a person. (50)

*Domination/compliance*

43. I don’t like instructors that are book pushers (insisting that students buy a large number of books, many of which are hardly used). (11)
44. I learn more if the instructor is approachability. (22)
45. I don’t learn much from instructors that seem to feel that they are above us students. (31)
46. I’ll give the instructor the respect he/she gives me. (38)
47. If I feel something should be done a certain way and the book recommends another way, I follow the book to reduce the chance of making a mistake and losing points. (45)

*Freedom: academic and personal*

48. I need to enjoy what I learn and the career I select. (12)
49. I learn best when the instructor is more concerned with how the students are learning than with the target dates in the syllabus. (23)

*Other… (Affects learning, but did not fit into the categories above)*

50. We are penalized for making mistakes. That impacts how I learn. (13)
51. The instructor should be passionate about what he/she teaches. (32)
52. The instructor should want to be with students. (39)

The numbers in parentheses indicate how the statements are ordered in the Q sample.
APPENDIX G

THE NUMERICALLY CODED Q-SAMPLE

1. Learning is understanding and comprehending concepts, not just memorizing. (1)
2. Information as a whole is important, but it’s a second step. You have to understand the parts first. (8)
3. I learn best when other sources of information about the topic being taught are added in addition to that of the textbook. (14)
4. I don’t like to learn if I don’t see a meaningful result, purpose or value. (17)
5. Learning should focus on applying what we learn in class to a physical activity. (19)
6. I don’t like to learn if I don’t see a real-world application. (20)
7. Low accessibility to the instructor impairs my learning. (24)
8. I would like to see more visual reviews of material to augment classroom presentations. Helps me to find “where I lost it.” (26)
9. If the instructor does not care, it becomes harder to learn. (34)
10. Learning of other cultures is important. (39)
11. I don’t like instructors that are book pushers (insisting that students buy a large number of books, many of which are hardly used). (43)
12. I need to enjoy what I learn and the career I select. (48)
13. We are penalized for making mistakes. That impacts how I learn. (50)
14. Learning can be uncomfortable. (2)
15. Continuity is very important. (9)
16. I learn best when the instructor understands the material. (15)
17. Learning reflects the ability to apply. (21)
18. Using new presentation technologies in the classroom is “lazy” teaching. (27)
19. Good instructors collaborate so that they can present content that aligns with the content of other courses in the program. (33)
20. I compare myself to others. (35)
21. I have to accept the existence of my cultural and personal biases, and do my best to keep it low, down, “toleranced.” (40)
22. I learn more if the instructor is approachability. (44)
23. I learn best when the instructor is more concerned with how the students are learning than with the target dates in the syllabus. (49)
24. Learning can be challenging. (3)
25. I want to see more in-depth explanations of how problems are solved. (10)
26. Learning is gradual over time. (16)
27. Learning about exercising, but never exercising is not learning. (22)
28. Presenting with Powerpoint, page after page, becomes boring and impairs learning. (28)
29. I feel bad when I am not grasping things as quickly as the people around me. (36)
30. It is important to get along with other people and regard them as important. (41)
31. I don’t learn much from instructors that seem to feel that they are above us students. (45)
32. The instructor should be passionate about what he/she teaches. (51)
33. Mistakes are part of the learning process. (4)
34. Learning relates to other topics and exhibits parallels between the content of more than one subject. (11)
35. Working in classroom “kills learning out.” It detracts from what is actually going on in a real-world sense. (18)
36. Reading directly from a textbook with no extra examples or inputs from the instructor. (29)
37. I am discouraged when the instructor treats me as if I’m inadequate or is disrespectful. (37)
38. I’ll give the instructor the respect he/she gives me. (46)
39. The instructor should want to be with students. (52)
40. Resolving mistakes and problems “sets” the information in my mind. (5)
41. I learn best when the instructor shows the reasons for the intermediate steps not just the outcome. (12)
42. I want to see “with my fingers,” not just with my eyes. (23)
43. Humor, history, practicality makes for a good presentation from an instructor. (30)
44. I learn better if I feel I am succeeding at it. (38)
45. If I feel something should be done a certain way and the book recommends another way, I follow the book to reduce the chance of making a mistake and losing points. (47)
46. I learn best when the homework and test problems are exactly like the example problems covered in class. (6)
47. The instructor should start with basic concepts and progress in sequence to more complex topics without jumping around. (13)
48. Learning results from inputs of information from both in and out of class. (25)
49. The instructor’s presentations should not seem like a form of media. (31)
50. Society ties our learning and education too closely to our worth as a person. (42)
51. It does not make sense to argue about homework or test points instead of using that time to learn more? (7)
52. I like to receive information in different ways from difference perspectives. (32)

The numbers in parentheses indicate the order of the statements in the assent-to-learn model. The categories are mixed similar to shuffling a deck of cards.
APPENDIX H
SHEET OF STATEMENTS FOR SORTING

<table>
<thead>
<tr>
<th>1</th>
<th>Learning is understanding and comprehending concepts, not just memorizing.</th>
<th>1</th>
<th>Learning can be uncomfortable.</th>
<th>2</th>
<th>Learning about exercising, but never exercising is not learning.</th>
<th>4</th>
<th>Resolving mistakes and problems “sets” the information in my mind.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Information as a whole is important, but it’s a second step. You have to understand the parts first.</td>
<td>1</td>
<td>Continuity is very important.</td>
<td>2</td>
<td>Presenting with Powerpoint, page after page, becomes boring and impairs learning.</td>
<td>4</td>
<td>I learn best when the instructor shows the reasons for the intermediate steps not just the outcome.</td>
</tr>
<tr>
<td>3</td>
<td>I learn best when other sources of information about the topic being taught are added in addition to that of the textbook.</td>
<td>1</td>
<td>I learn best when the instructor understands the material.</td>
<td>2</td>
<td>I feel bad when I am not grasping things as quickly as the people around me. I feel bad when I am not grasping things as quickly as the people around me.</td>
<td>4</td>
<td>I want to see “with my fingers,” not just with my eyes.</td>
</tr>
<tr>
<td>4</td>
<td>I don’t like to learn if I don’t see a meaningful result, purpose or value.</td>
<td>1</td>
<td>Learning reflects the ability to apply.</td>
<td>3</td>
<td>It is important to get along with other people and regard them as important.</td>
<td>4</td>
<td>Humor, history, practicality makes for a good presentation from an instructor.</td>
</tr>
<tr>
<td>5</td>
<td>Learning should focus on applying what we learn in class to a physical activity.</td>
<td>1</td>
<td>Using new presentation technologies in the classroom is “lazy” teaching.</td>
<td>3</td>
<td>I don’t learn much from instructors that seem to feel that they are above us students.</td>
<td>4</td>
<td>I learn better if I feel I am succeeding at it.</td>
</tr>
<tr>
<td>6</td>
<td>I don’t like to learn if I don’t see a real-world application.</td>
<td>1</td>
<td>Good instructors collaborate so that they can present content that aligns with the content of other courses in the program.</td>
<td>3</td>
<td>The instructor should be passionate about what he/she teaches.</td>
<td>4</td>
<td>If I feel something should be done a certain way and the book recommends another way, I follow the book to reduce the chance of making a mistake and losing points.</td>
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<tr>
<td>7</td>
<td>Low accessibility to the instructor impairs my learning.</td>
<td>2</td>
<td>0</td>
<td>I learn best when the homework and test problems are exactly like the example problems covered in class.</td>
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<td>8</td>
<td>I would like to see more visual reviews of material to augment classroom presentations. Helps me to find “where I lost it.”</td>
<td>2</td>
<td>1</td>
<td>The instructor should start with basic concepts and progress in sequence to more complex topics without jumping around.</td>
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<tr>
<td>9</td>
<td>If the instructor does not care, it becomes harder to learn.</td>
<td>2</td>
<td>2</td>
<td>Learning results from inputs of information from both in and out of class.</td>
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<tr>
<td>10</td>
<td>Learning of other cultures is important.</td>
<td>2</td>
<td>3</td>
<td>The instructor’s presentations should not seem like a form of media.</td>
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<tr>
<td>11</td>
<td>I don’t like instructors that are book pushers (insisting that students buy a large number of books, many of which are hardly used).</td>
<td>2</td>
<td>4</td>
<td>Society ties our learning and education too closely to our worth as a person.</td>
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<tr>
<td>12</td>
<td>I need to enjoy what I learn and the career I select.</td>
<td>2</td>
<td>5</td>
<td>It does not make sense to argue about homework or test points instead of using that time to learn more?</td>
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<td>13</td>
<td>We are penalized for making mistakes. That impacts how I learn.</td>
<td>2</td>
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</tr>
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<td>The instructor should want to be with students.</td>
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<td>I like to receive information in different ways from different perspectives.</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix I
Sample Interview

Interview with KC, 31 Jan 2014

Arter: Why did you pick your particular selections, especially your +5 and your minus five? What were your driving factors?

KC: Ah, first, ah, my plus fives were…

Arter: (interrupts) You can look at your paper.

KC: (continues) …were understanding the basics to any topic ‘cause I can’t see [how that] if you don’t understand the basics you can progress on and grasp really in-depth parts of it. You know, especially in math and engineering if you don’t understand the core curriculum, you know, you are not going to advance on. My second choice, ah, for the plus five was, ah, understanding concepts is better than memorizing formulas and what not, and you can always reference something for a formula. So memorizing it is kind of irrelevant to me. If you understand it, and you know how to apply the formula. And so understanding to me is [a] giant part of my learning. And then a lot of my threes and fours were, ah, instructor interactions…

Arter: Uh-hmm

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KC: I am a very verbal and I learned old school style, you know. I like to do everything hands on, and, ah, I like to do everything in a systematic order and as things are presented to me in a systematic order that I can understand and see them I get it better then by jumping around, you know, missing intermediate parts of problems and stuff like that. So, ah, the way things are presented to me, and being able to talk to instructors, and approach instructors, just be personable with them, not just mainly focus on the learning aspect. I like to talk to people and learn things about them and just be personable rather than always so professional. So, I really like to interact with my instructors. I know a lot of people [are] kind of on the other spectrum I think, well it’s really a waste of my time, really, do they care about me and do they care that I have kids or that I work, or that, you know…and I think that’s part of you bonding with the instructor, you know? And, if people want to talk to each other, and at least the way I see it, most people want to be social, and interact…and it’s not just a face in a seat. You know? You know a little bit about them. And so I always try to know all my instructors a little bit. Some more than others. Ah, but on the other hand, for my “least,” ah, comparing myself to others, I just can’t do that, because I compare myself to Albert Einstein and I, you know, I never know that intellectually I’m going to be this high as standard as him then I always just going to dwell on that and not try to move forward. So, by comparing myself to my brother, who is a terrible person…

Arter: (laughs)
KC: *(laughs)*…I don’t…as a kid my brother was a horrible person, so when I—he was older than me—so when I moved through school all my teachers were always like, “Oh, there’s one of those boys from that family, they, you know, they’re a bad person.” So, you can’t compare me…

*Arter: My brother.*

KC: …because I’m totally different from him. And so, and in learning it’s the same way. Now, some people get things really quick and understand and other people take a little bit longer and they got to practice a lot, so comparing yourself to others really, to me, doesn’t make too much sense. Ah, as far as in the middle, my zero choices, I felt that those were things that you should expect, like learning is a challenge. You should expect learning to be challenging. It can be uncomfortable. You should expect to spend some time doing it, and it not to be 5 minutes. You know, it’s things like that that you should expect. Ah, making mistakes and, and fixing them, and that put it in your brain better. You should expect not to be perfect, because nobody’s perfect. So those items I, I think were kind of just a common item that you should expect when you in the learning process.

*Arter: Now did any of those statements leave you wondering like, what the heck? Like any of the statements strike you as bizarre, or kind of off point?*

KC: Naw.

*Arter: Okay.*

KC: Naw.
Arter: And, do you think that many other students kind of like go through some of the things you go through? (Just as KC starts to answer.) Let me reword the word “many.” Do you think that some of the students go through the same things you go through?

KC: Well, I’m a non-traditional student, so I don’t think that traditional students have gone through the steps of life, and can prioritize things, or can take doing bad at something as not, ah, let me…, ah, trying to rephrase, ah, I see a lot of younger students that just by being here they feel that “I’m here, I should…, I paid my money, you know, I should get my degree” (brief chuckle), but they don’t feel that they should have to work and progress through it. So, I feel that if they were a little more mature and went, you know, had some actual experience working and stuff. Now you can’t get somewhere and say, “Oh, I’m the CEO, I’m going to start off as the CEO.” (We both laugh.) You have to progress through that and work up the chain, and it’s learning, it’s saying, “Wait a minute.” And, I actually take it like it’s another job. I dedicate some specific time to it. So, I don’t think that some of the younger more traditional students do that, at least in some of my courses I been at because a lot of them are not looking for answers and looking to find them themselves. They’re looking for people to hand them answers, and I think part of being here is you going through the motions and, and embedding that stuff into your brain, not just trying to regurgitate something or just find a quick answer to satisfy a question. Ah, a little life experience to some of the traditional students would be great, because working for a manager that wants you to get things done now, and right, and you know,…and even if you do it wrong….

Arter: Doesn’t allow you all the excuses very readily. (laughs)
KC: Yeah, yeah. Even if you do something wrong, at least you tried. So…

Arter: Okay. That’s all I got. I just had a few questions.

KC: Okay.