

This document contains discussions that were led by my advisor, Dr. David Brooks, for two semesters of my seminar classes. The discussions begin with making suggestions for the book that he was writing called the Unified Learning Model (ULM).

Discussions from my second seminar include papers by Smoot, Kennedy, how to motivate students and teachers, evolution, and working memory.

Editing the ULM - Spring 2012 Seminar Discussion

Chapter 1

I think that the tree example in the Working Memory section is a good place to talk about priming. You could say something like: What you say about the tree would likely be the result of what was primed in your memory. The effects of priming vary and take many forms. According to Daniel Kahneman, "...you must accept the alien idea that your actions and your emotions can be primed by events of which you are not even aware." Your working memory is effected by lots of different factors. Many of which you are not even conscious of.

Chapter 2

Describes and activities are misspelled in the second paragraph. Understand is misspelled in the last paragraph

In the fourth paragraph, I think it would be useful to provide some examples of the things that people use for system 1 especially for teachers. You could talk about teachers that seem to have eyes on the back of their heads and can anticipate an interruption before it happens. For ordinary things that use system 1, you could talk about tasks that are automated like reading and walking. When you

speak about experts, you could give the example of weather forecasters from an article by Shanteau (see reference and link to article below).

Shanteau, J. (1992). Competence in experts: The role of task characteristics. *Organizational Behavior and Human Decision Processes*, 53, 252-266.

http://kstate.co/psych/cws/pdf/obhdp_paper91.PDF

Chapter 3

In the Motivation section, you could talk about the problems that are mentioned in Chapter 3 of *Thinking, Fast and Slow*. Kahneman mentions that the failure on the minitests of the “bat and ball problem, the flowers syllogism, and the Michigan/Detroit problem having something in common”. The inability to solve these problems seems to be “...a matter of insufficient motivation, not trying hard enough”. System 1 causes the students in the study to stop thinking before drawing the right conclusion. Kahneman says that “it does not seem to be unfair to call the self monitoring of these young people and their System 2” lazy. Those who get the problems correct seem to be devoting more attention to them. He calls them “engaged”.

Chapter 4

In Part 1-Characters of the Story: Kahneman has a few words to say about why multitasking doesn't work. He states that "The often phrase 'pay attention' is apt: you dispose of a limited budget of attention that you can allocate to activities, and if you try to go by your budget, you will fail." As you can see from this statement attention is limited. It can only be stretched so far, and when that boundary is passed, you can no longer attend to items beyond that. You can only hold so many things in your attention at one time so if you try to ignore that rule disaster could be the result of those actions.

Chapter 5

Children are especially vulnerable to making errors in accounts of eye witness testimony. An example can be found in an article by Greenhoot et. al which was “...motivated by both real-world issues surrounding children’s event memory and testimony and theoretical questions about the factors that influence children’s interpretation and recall of information.” In this article, the authors mention a study by Leichtman and Ceci where a stereotype about an individual seemed to distort their memories of him. In the study, the children's expectations about the male visiting their classroom were manipulated. Children told that the man was clumsy and bumbling were more likely to remember false things about him that were consistent with this manipulation. When children weren’t given expectations, they were less likely to report remembering such things.

The Relations Between Children’s Past Experiences, Social Knowledge, and Memories for Social Situations

Greenhoot, et al.

<http://www.psych.utah.edu/people/people/tsethlikai/publications/greenhoot-tsethlikai-wagoner-2006.pdf>

Abstract: This study explored the relations between 5- and 6-year-olds’ (N = 40) past social experiences, social knowledge, and interpretation and recall of social situations. Children were read stories depicting a fictional child’s behaviors, and path analyses related children’s impressions of the story character and story recall to their expectations about social situations and parent reports of their behavioral histories. Children’s behavioral histories predicted their social expectations, which predicted their impressions of the character, and their impressions shaped their memories of the character’s behaviors. These links, however, varied according to the complexity of social knowledge. The findings suggest that individual differences in children’s interpretation and recall of identical events may be partially explained by variations in past experience and background knowledge.

Leichtman, M. D., & Ceci, S. J. (1995). The effects of stereotypes and suggestions on preschoolers’ reports. *Developmental Psychology*, 31, 568–578.

http://www2.psych.ubc.ca/~hhyeung/psyc412/Leichtman_1995.pdf

Abstract: Children's (N= 176) reported memories of a strange man's visit were studied. Three- to 6-year-olds were interviewed repeatedly after the event in one of the following conditions: (a) control, in which no interviews contained suggestive questions; (b) stereotype, in which children were given previsit expectations about the stranger; (c) suggestion, in which interviews contained erroneous suggestions about misdeeds committed by the stranger; and (d) stereotype plus suggestion, in which children were given both pre- and postvisit manipulations. Results from open-ended interviews after 10 weeks indicated that control participants provided accurate reports, stereotypes resulted in a modest number of false reports, and suggestions resulted in a substantial number of false reports. Children in the stereotype-plus-suggestion group made high levels of false reports. All experimental conditions showed dramatic developmental trends favoring older children.

Chapter 6

Learning Principle 3: Working Memory and Motivation

In paragraph 7, where you talk about being tired you could discuss how motivation is lost. Kahneman mentions that “Unlike cognitive load, ego depletion is at least in part a loss of motivation. After exerting self control in one task, you do not feel like making an effort in another, although you could do it if you really had to.” System 2 requires effort that depletes your motivation. It can cause you to lose motivation to the point that you can not longer participate in a task because you are tired and extended beyond the limits of what your System 2 can do.

Chapter 7 - Heredity

Overestimated is misspelled in the second paragraph.

In paragraph 2, you talk about massive IQ gains being found for several countries. This has even been happening in the US and other developed nations. According to Ulric Neisser, “These gains are far too rapid to result from genetic changes. There evidently are substantial environmental influences on g, even if

we do not clearly understand them at the present time. Moreover, the sheer size of the gains undermines the very concept of ‘general intelligence.’” He attributes the gains in IQ to test taking sophistication, nutrition, schooling, child-rearing practices, and the visual and technical environment.

Neisser, U. (1997). Rising scores on intelligence tests. *American Scientist*, 85, 440 ±447.

<https://www.americanscientist.org/issues/issue.aspx?id=881&y=0&no=&content=true&page=4&css=print>

Chapter 8 - SES and School Performance

Building, percent, and supervisors are misspelled in the first paragraph.

I would change the last part of the last sentence in the first paragraph from “are so high based on test performance” to “are so highly based on test performance”.

My only other comments would be that I think that offering some suggestions for improving SES gaps would be useful.

Discussion 2 - Smoot

Are any anomalies revealed? That is, do some informants appear to advocate notions clearly in opposition to those of others?

I like the quote that you choose to use from Smoot. I think that it stresses the importance of learning as the outcome of teaching and that it doesn't matter what or how something is taught so long as something is learned. There were two additional things that I would add to your list of what the teachers had in common. The first would be that several of the teachers mentioned how they enjoyed when students experienced that aha moment when learning occurs. The second is that the teachers themselves also find it important to continue learning, both about their subject matter and their students. It is important that they do so to become even better at what they do.

Discussion 3 - Kennedy

Let's discuss the Kennedy Paper

Reflect on how that paper may affect how we posted for the 2nd discussion (Smoot).

Kennedy: "Social psychologists are persuaded that researchers as well as laymen tend to overestimate the influence of personal traits and under- estimate the influence of situations on observed behavior. The author of this article suggests that education researchers and policy makers may be overestimating the role of personal qualities in their quest to understand teaching quality. ..."

The main themes that I believe flow through these stories include enthusiasm, creativity, dedication and compassion. These teachers seem to love the profession, enjoy the challenge of excelling in spite of "the system" and embrace the individuality of every student. They use creative approaches to make curriculum relevant, exciting and challenging to students in a safe and trusting environment. Many attribute their success to the help of a mentor and honor that tradition by mentoring others. They have compassion for their students without regard of ability, or life status. These are the teachers that get to work early and leave late; they are the kind of teachers that are involved in afterschool clubs and activities – not the ones racing the students out the door at last bell.

If you look back on most of the posts we made regarding Smoot's book, we attribute a majority of the qualities of great teachers to personal characteristics. These teachers seem to be able to find a way to succeed in any situation from teaching in charter schools to working with students with special needs to providing instruction in prisons. The teachers in the book rarely seem to attribute their success to their situations in fact as Phil pointed out they seem to excel in spite of "the system". I don't think that focusing on personal traits is a bad thing, but I think that it is hard to measure these characteristics and that is what is so frustrating.

It is also not easy to change personal characteristics as Kennedy points out. She states that "...it would be easier for us to improve teachers' effectiveness by altering their work assignments than it would be to alter their enduring personal characteristics such as their educational backgrounds or test scores." This makes a lot of sense. You can give teachers more planning time, materials that are better aligned with learning outcomes, and reasonable workloads. You can also measure and compare teachers based on these things. It would be a lot simpler to give a teacher an extra half hour of planning time than to try to make them more creative.

Another thing that is difficult to control for are the individual students that teachers have in their classrooms. Students who are disruptive and don't want to cooperate or to even be in school can effect both the teacher and the other students. It was "...found that stronger and weaker schools differed in part in their proportions of students who attended school, were on time, and did their homework. These are all indicators of student cooperation and willingness to be taught." These factors can be influenced by teachers to some degree but what is important to consider is that they can vary from class to class throughout a teacher's day and can impact the classes' performance as a whole.

Kennedy does say that "...some teachers are better able than others to accommodate the variety of stresses and strains they may face in their work. And to the extent that this is so, these differences may be due to differences in personal qualities." Based on this you can conclude that she is saying that not all of the teacher's behaviors are influenced by the

situation, but she seems to be trying to stress is that situational factors should be factored into the equation.

What seems to separate the great teachers is how they are able to cope with the factors that are out of their control. I think that these skills result from having the traits that we used to describe the teachers interviewed in Smoot's book.

Discussion 3 - Response 2

I could find the post that I wanted to respond to with this so I started a new thread.

One of the things we haven't really discussed yet are the teachers in Smoot's book that don't assign grades. What makes them successful? Since I don't have much experience in working in K-12 schools, I don't always feel comfortable responding to some of the posts from those who have. I don't really agree with the discussion that has been going on about using the Myer's Briggs test to determine what subject someone should teach. I am an ISTJ. My I and J numbers are both very high and I am most closely on the fence between S and N. Being such a strong I means that if I were teaching a classroom of 30 students all day it would really wear me out (the reason I say this is that my first "real" job was as a waitress and just doing that for a few hours was really draining for me), but I have always enjoyed teaching people about computers in one on one situations like when I teach someone how to do something in Blackboard for example. Doing that isn't what people tend to think of as being a traditional classroom teacher, but I think that the reason that this works for me is because it is in my area of expertise. That and it's a more comfortable social situation for me since I am pretty shy (I guess you could say this situation is best for me because I am such a strong I). I could also teach someone more than they would ever want to know about raising rabbits and that is a result of having a mentor who is a rabbit judge and has raised them for over 60 years. My "grade" for my knowledge about rabbits was placing first in 4-H showmanship at the Iowa State fair when I was a junior in HS. I don't have rabbits anymore because I no longer live on a farm, but I can still remember most of what I learned about showmanship from him as a result of lot of practice when I was in junior high and high school. I think that the

fact that I know a lot about rabbits is because of my mentor and has nothing to do with me being an ISTJ.

Discussion 4

Response 1

I wondered the same thing based on what the question of what to do with the "lower quality" teachers and I think that is a good question to raise. Measuring teacher effectiveness in the way Buddin does discourages people from going into the teaching profession and encourages them to leave it or to try to find a job at a "better" school where students receive higher scores on standardized tests because that is how their effectiveness is being measured. Doesn't this have the opposite effect that we want it to? Wouldn't it be better to try to get what he considers the most effective teachers into the schools that have the most need to improve their standardized scores because the students come from disadvantaged backgrounds? Wouldn't it make more sense to invest money into helping the "ineffective" teachers improve? We want the students to learn. Why shouldn't the teachers?

Response 2

I enjoyed both your responses and the way that they discussed things from a scientific perspective. My background is in the social sciences (my undergrad degrees are in psychology and human development) and I found the courses that I took in cognition to be some of the most interesting. As Dr. Brooks pointed out, it is important to consider the data and to me the model put forth by Buddin is misleading. Using the most readily available data can be dangerous because as many people pointed out it does so at the expense of excluding some very important variables. Buddin's study drew attention because it supports the legislation that has had a lot of money invested into it. As researchers we know that you shouldn't draw conclusions based on one study only because it supports the outcome that it's expected to. Buddin overwhelms the reader with statistics that are hard to understand and it couldn't even be replicated by the authors of the second article. Unfortunately, the article by Briggs and Domingue probably won't get as much attention as the first article, but it should.

Discussion 5 Paying Teachers or Students?

How to motivate?

When I was reading the articles, the question that came to my mind was: What is the best way to motivate both students and teachers to perform at their best? The two studies looked at the effect of providing monetary incentives to both groups and it was found that this worked better for students than for teachers. If this is the case, it may make one wonder: what is the best way to invest the money? All three articles involve a large investment of resources with more going towards the incentives for teachers than to the students in the article from the Teachers College Record. So should more money be going to the students? After all, it is their performance that is being used to measure the quality of their teachers. I think this is an indication that the teachers aren't be evaluated in the most effective way.

The USA Today article noted that Arne Duncan's faith in merit pay was not shaken as a result of the NCPI study. (page 2). His spokeswoman, Sandra Abrevaya, went on to say that "While this is a good study, it only looked at the narrow question of whether more pay motivates teachers to try harder,...". Her quote is concluded with her statement that the study "...did not address the Obama administration's push to 'change the culture of teaching by giving all educators the feedback they need to get better.'". So maybe the question comes down to what feedback do teacher's need to be receiving to get better and how should it be provided if merit pay isn't the answer? The ULM stresses the importance of feedback in learning indicating that it "... may be what matters most." and I think that feedback needs to be provided to both the students being assessed and the teachers that are being evaluated (page 143). I doubt that students are given the chance to review the questions that they missed on the standardized tests that are being used to evaluate them. I know that I never had that opportunity when I took the Iowa Test of Basic Skills, the ACT or GRE and would have been curious to know at least the general subject matter of the questions that I had difficulty with.

This information would probably be of interest to the teachers too so that they could know if there were particular areas where the students in their classes were struggling that could be focused on in classes (maybe this gets provided now? I am not a classroom teacher so I don't know). To me, having some kind of feedback would probably be valuable to both the students and teachers.

I have noticed that several of us have quoted the following statement about teachers from the NCPI study: "Eight in ten said they didn't change the way they taught to improve their odds of earning a bonus." Most of you that have commented on this seem to agree that this is a problem and I feel the same way. If you want your students scores to improve, wouldn't it follow that you would want to try to improve your teaching as well? I guess they may have thought that they were already teaching effectively enough to earn the bonuses, but to me that defeats the purpose of giving them out. The bonuses also do not provide feedback to the teachers that don't receive them. These teachers may wonder what they need to be do to get better so that their students will achieve higher scores in hopes that they can eventually earn the bonuses themselves.

The last issue that I will address is what effect teacher bonuses have on the culture of a school that result from some teachers not being able to receive the incentives offered. The third article was about implementing a District Awards for Teacher Excellence (D.A.T.E.) program in Texas. The program is state funded and all districts "...are able to receive grants, but participation is voluntary" (page 12). This incentive pay program has been operating for three years from 2008-2011. One of the things that I found interesting about the article were the reasons that schools gave for not participating in the program or for only participating in it during the first year. The administrators at schools that didn't continue D.A.T.E. beyond the first year indicated that they made this decision because "55% agreed that D.A.T.E. had no impact on teaching practices and professional behaviors, and 45% of them agreed that Year 1 D.A.T.E. caused resentment among teachers and that the program had a negative effect in the district" (page 38). In schools that choose not to participate in D.A.T.E at all the numbers were even higher with approximately 70% saying that they were concerned "...about D.A.T.E.'s potential

impact on school culture and professional collegiality." (page 25). If a teacher's students aren't performing at a level where they are able to receive an incentive, how does this make them feel about teachers whose students are? What can they do to improve their teaching so they can receive an incentive and what kind of feedback are they going to get to help them with that? Maybe they could trade students from one of their classes with a teacher that was able to receive a bonus (same grade level and subject). To me, it is really easy to see why this would cause problems with the culture at a school. How can a system like this motivate a teachers whose students aren't doing well to get them to do better and what is in it for the students?

MORE NOTES for Discussion 5 - Didn't use

In the article from the Teachers College Record, the authors ask an important question regarding studies conducted as a follow-up to theirs. They state that "We are then left with a conundrum: Is it possible to elicit maximal test performance without offering monetary incentives?". They feel that if there is a way to do this it would be more worthwhile to study it rather than to replicate their study. I agree with them on this point, but I don't know what else could be used to motivate students to this level. I also wonder if using money as an incentive would work as well for younger students as it did with the high school seniors.

Like JonRoss, my parents gave me small monetary incentives for earning good grades but that wasn't the only thing that motivated me to perform well in school.

STUDENTS

This theory says that the effort that individuals are willing to invest in a task reflects the extent to which they expect to be able to perform the task and whether they value the rewards they will get or see the activity as important and worthwhile

We are then left with a conundrum: Is it possible to elicit maximal test performance without offering monetary incentives? If there are such strategies, it

may be more useful to investigate their utility in an experimental or quasi-experimental setting rather than conduct a true replication of the experiment reported here.

MY RESPONSE TO THIS ARTICLE

How to motivate?

The authors of the first article ask an important question regarding studies conducted as a follow-up to theirs. They state that "We are then left with a conundrum: Is it possible to elicit maximal test performance without offering monetary incentives?". They feel that if there is a way to do this it would be more worthwhile to study it rather than to replicate their study. I agree with them on this point, but I don't know what else could be used to motivate students to this level. I also wonder if using money as an incentive would work as well for younger students as it did with the high school seniors.

What is the best way to invest the money?

TEACHERS

...they didn't change the way they taught to improve their odds of earning a bonus.

importance of improving teachers' working conditions, not just their pay

According to district officials, districts most often participated in the D.A.T.E. program because

they believed it would improve the quality of student learning and teaching practices in schools

and less because school personnel deserved extra pay for the work they were already doing.

Teachers did not perceive negative effects from D.A.T.E., but they also did not indicate that the incentive plans were contributing much to school improvements. would improve the quality of student performance in schools. However, even more respondents rated this factor as having high importance in 2010 compared to

2009 (up to 81% from 73%). The same pattern applies to district officials' belief that D.A.T.E. would improve the quality of instruction in schools

49.8% Reason for not implementing a DATE program would be that it "would have a negative effect on school culture and professional collegiality".

45% of them agreed that Year 1 D.A.T.E. caused resentment among teachers and that the program had a negative effect in the district

Others suggested the need for improved strategies for measuring and rewarding the performance of school personnel. Among these responses, ideas for improvement primarily included the need for better tools to measure performance of teachers that work in grades/subject areas that are not tested by TAKS, as well as more advanced techniques for determining teachers' contributions to student growth.

left off at pg 48

karen

On a related element, the USA Today article commented about the Tennessee study not addressing the "push to 'change the culture of teaching by giving all educators the feedback they need to get better'" (p. 2). I had some trouble thinking of the merit pay process as one of being a feedback mechanism. I guess it would be one way to provide recognition, but, if we think about feedback in the ULM sense, then more information is needed. Feedback is not just about what's been done "correctly" but also what needs to be corrected.

Evolution discussion

form groups based on ideology

support the cross-generational accumulation of cultural knowledge pg7

I have proposed that the just-described conscious-psychological, working memory and controlled problem-solving mechanisms define the core of general fluid intelligence (Geary, 2005). In other words, 100 years of psychometric and cognitive research on general intelligence has identified the evolved mechanisms

that enable humans to cope with and learn from evolutionarily novel situations, not unlike Cattell's (1963, p. 3) original description, "Fluid general ability ... shows more in tests requiring adaptation to new situations, where crystallized skills are of no particular advantage." pg12

To illustrate modular plasticity, consider that the strong bias of human infants to attend to human faces, movement patterns, and speech reflects, in theory, the initial and inherent organizational and motivational structure of the associated folk-psychological modules (Freedman, 1974). These biases reflect the evolutionary significance of social relationships and recreate the microconditions (e.g., parent-child interactions) associated with the evolution of the corresponding modules (Caporael, 1997). Attention to and processing of this information provides exposure to the within-category variation needed to adapt the architecture of these modules to variation in parental faces, behavior, and so forth (R. Gelman & Williams, 1998). It allows infants to discriminate the voice of their parents from the voice of other potential parents with only minimal exposure. When human fetuses (gestation age of about 38 weeks) are exposed in utero to human voices, their heart-rate patterns suggest they are sensitive to and learn the voice patterns of their mother, and discriminate her voice from that of other women (Kisilevsky, Hains, Lee, Xie, Huang, Ye et al., 2003). pg 14

Evolutionarily Informed Educational Science 15

Teachers

My best and most memorable teacher was the art teacher that I had through 2nd grade in elementary school and then again from when I was a freshman to a junior in high school. She was great! The projects she assigned were creative, engaging, and challenging. She always gave good suggestions for improving projects. I was able to get recognition for the art work that I created in her classes. I have two favorite projects that I created for one of her classes in my junior year. The first was a collage that started with a picture of a room with an open violin case. We were then to cut out pictures from magazines that built around the image we choose. I used musical instruments and I found a picture of

a CD which I used to create the background of the image. I extended the colors from the CD out behind the images that I used from the magazine. I was really happy with the final result. The other project that I enjoyed was one where she took a picture of us doing what we wanted to do when we grew up. The picture that she took of me was on with an older Apple computer and I used that as the basis for a drawing with a computer key board that said some like “Computers, the keys to my future”. Turned out that is what ended being true when I choose my career after in my junior year of college..

The next two teachers I am going to talk about are ones that had strong points and weak points. They were both professors in my undergraduate major. People tend to think of the degree I got an easy major, but I took courses as though I was planning to go to graduate school. The most difficult one was Clinical Neuroscience. In that course, we had to memorize and correctly spell parts of the brain and the names of neurotransmitters. We also had to know what their functions were and where they were located in the brain. The reason that I liked the course was that it challenged me beyond what most of the other courses in my major had up until that point. The reason that I didn't like that professor is that I haven't retained very much of what I learned while I was there. It has been awhile since I took that course, but not so long that you would think that I would have forgotten most of what I learned. The problem was that studying for his tests involved cramming everything into my brain the night before the test by reading and re-reading my notes over and over. I didn't make any connections between the materials that would help me remember them in the future. I think the problem was that a lot of the material didn't get effectively stored in my long-term memory. The second teacher I am going to discuss was similar in what I would consider his weaknesses. The course was a 600 level Experimental Psychology course. In it we were graded for three things: labs, an essay test, and a research paper based on an experiment that we conducted as a class by recruiting our friends and roommates to participate. This course was also very challenging. The hardest parts were the statistical analyses that were involved and the topic of the paper which was lexical ambiguity resolution. I still have

that paper, and when I try to read it, I feel like I am reading something written in another language. I know that at one point however I had a pretty good understanding of it. Good enough that the professor for that course wrote one of my letters of reference for graduate school. The statistics I learned in that class are also pretty much gone from my memory. However, I am finding that the stats classes I am taking here are less difficult for me than I expected them to be so there must be something that more that retained than I think that I did..

The last teacher from my undergraduate major also wrote one of my letters of reference. She was my advisor for my honor's project. She falls under the category of a really good teacher because she provided me with a lot of guidance with the research project that I did. I received a research award early in the semester (after submitting what was basically my IRB proposal) and the work that we did ended up eventually being published. She gave me a lot of direction in designing the experiment, but she expected me to do the work of writing and gathering data myself (well, with the help of two other undergraduate students who I trained on the procedure for the study, coding, data entry, and reliability testing). It was a difficult study to conduct because it involved kindergartners and we had to get permission from a lot of different people to be able to conduct the study (IRB, the school district, principals, teachers, parents, and the kids themselves). Because of the relatively small sample of students we were able to recruit as a result of this and because we used a wide variety of scales to gather data about the students from parents and teachers, I was only able to analyze the data using correlations. We found something, but it wasn't quite what we expected to find. Having done a study like this makes the thought of writing a dissertation less intimidating.

Find TWO papers in 2007-2008 with working memory in the title or abstract that are of interest to you and summarize them in a brief abstract that YOU write. Please include a link to the paper in your response.

Write a brief summary of working memory as you would present this topic to a series of new college or university instructors in disciplines other than education or psychology (chemistry, English, artists, etc.)

It is important to understand working memory as it is essential part of a student's learning process. It is not something that just educators and psychologist need to understand. All students learn in the same way across disciplines. The resulting knowledge may be different but how that knowledge was acquired is the same. Working memory is where new information is first processed in the brain. Its capacity is limited as it can only hold approximately five to eight items. Working memory interacts with motivation and knowledge. If the information received there is attended to, it becomes a part of the student's knowledge also referred to as long term memory. Not everything that is in working memory is learned or becomes knowledge. For example, things like phone numbers remain there for just as long as it takes to look one up and then use the phone. Your goal should be to maximize the amount of information that gets moved from working term memory to knowledge. One of the important factor influencing working term memory is motivation. The more motivated the student is, the more working term memory is devoted to a task and as a result the more likely it is to get stored as part of their knowledge. You need to make an effort to motivate students so this happens. Knowledge is also important as related knowledge is activated by working memory so that it can be used to assist with its transfer. As knowledge increases, it begins chunking and automizing the processes and making it easier to move information from working memory to knowledge.