

## **Socially Constructed Learning Activity: Communal Note-Taking as a Generative Tool to Promote Active Student Engagement**

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### **Abstract:**

*This narrative account by an instructor and two students examines a generative note-taking method called “communal notes” based on social constructivism. This method was conceptualized and implemented in an Educational Psychology course in the fall of 2014 in order to help students organize, review, and share the new knowledge acquired in class with their peers. Through the use of visual representations such as pictures, cartoons, symbols, and written language drawn and written on large sheets of paper covering their desks, students engage in a socially constructed note-taking process with their group members to express their thinking and learning. The goal is to help not only the note-takers but also their peers, as they freely share and make sense of their notes in the verbal and written means. The authors reflect on the versatility of communal note-taking, reaching beyond an isolated learning experience and creating learning relationships that result in greater depth within the social construct. This method serves as a tool to foster a rich student-centered environment where students become active agents of their own learning as they co-construct knowledge with their peers.*

### **Key Words:**

student-centered learning, social constructivism, co-construction of knowledge, generative note-taking

## Introduction

“Don’t copy everything! Only write down those words that are important.” I was getting increasingly frustrated when students, quarter after quarter, frantically copied in their notebooks everything they saw on the PowerPoint despite repeated reminders about not mechanically copying every word. I often encountered resentful and hostile glares on students’ faces as if I had robbed them of great opportunities to learn. Sometimes I had to push the button to block off the computer screen so that students would focus on discussions at hand. Having gone through this experience in almost every course, I began wondering about the very act of note-taking, whether it truly helps students learn more when they take notes. Is there a more effective and deliberate note-taking method to promote active thinking rather than merely passively copying what they see and hear? How about applying note-taking within the context of social constructivism instead of considering it as an individual endeavor? These questions pushed me to reconsider note-taking as an essential learning tool for students to go beyond recording information or facts, but to engage in reflecting on their learning at hand in the company of their peers.

## Note-Taking Practice in the University Classroom

For many college students, taking notes is an automatic response to instruction, ingrained in their long years of schooling, starting with grade school. While there are different functions and methods of note-taking, prior research indicates that note-taking in general facilitates students’ learning (Kiewra, 1988; Kiewra, Dubois, Christian, McShane, Meyerhoffer, & Roskelley, 1991; Kobayashi, 2005). The common functions of note-taking include encoding (process of recording notes) and external storage (review of notes), both of which contribute to learning, with more importance on the external storage function (Kiewra et al., 1991). Extending this dichotomous model, Kiewra et al. (1991) proposed three functions of note-taking: encoding (take notes/no review), encoding plus storage (take notes/review notes) and external storage (absent self from lecture/review borrowed notes). These functions were created based on two notions: (1) repetition, which states that repeated exposures to information results in greater learning and (2) generative processing such as developing summaries, graphs, tables, examples, and conclusions, which asserts that generating relations or connecting aspects of present learning to one another and to prior knowledge results in greater learning outcome. In particular, when compared with verbatim note-taking, generative notes are considered more difficult to produce during lecture, since the information processing demands of lecture are great, starting with keeping up with often fast-paced talk, comprehending multiple concepts at different levels of hierarchy, making internal and external connections, deciding on what and how to write the interpreted information, while attending to mechanical aspects of note-taking (Kiewra, 1991; Kiewra et al., 1991; Kobayashi, 2005; Piolat, Olive, & Kellogg, 2005). These challenges can be ameliorated by the use of organizational tools and lecture cues given to students in order to reduce the cognitive loads to process the new information more effectively (Titsworth & Kiewra, 2004; Makany, Kemp, & Dror, 2009).

While generative note-taking normally requires more time and effort compared to verbatim or less generative note-taking, it becomes an essential tool for students to

organize knowledge as they build connections among different ideas through the use of non-linear representation method such as graphic organizers including a matrix (Makany et al., 2009; Robinson, Beth, Odom, Hsieh, Vanderveen, & Katayama, 2006). The spatial display of information directs students' attention to critical ideas as well as identifying across-concept relations, both of which are not readily detectable in linear forms of notes (Robinson et al., 2006). Structuring new knowledge using non-linear methods offers a visually accessible format by "putting concepts and examples into a semantically more connected network of mental representations," resulting in a more "optimal knowledge management system than traditional note-taking" (Makany et al., 2009, p.632-633). This generative form of note-taking holds promising practice to help students organize their thinking with internal connections (relationships within lecture ideas) and external connections (relationships with prior knowledge).

### **What is Communal Note-Taking?**

As a firm believer in social constructivism, which posits that learning and cognitive maturation into higher level thinking develop via social interactions (Vygotsky, 1978), I have endeavored to create a student-centered learning environment in my classes for students to co-construct knowledge with their peers and instructor (Ahn & Class, 2011). Following this philosophy, in my Educational Psychology course which is a prerequisite course in the Teacher Education program, I conceptualized and implemented a generative note-taking activity called "communal note-taking" in the fall of 2014. In each weekly session, as soon as students arrive in the classroom, they immediately put their desks together in the same groups of 4-5 people to take notes on a large sheet of butcher paper covering their desks. A group representative comes to the front to pick up the same sheet continuing from previous sessions, along with different color markers. As students trickle in to be seated, their large "notebook" is there in front of them, reminding them of previous learning experiences leading up to the present (See Figure 1). At the beginning of each session, students are given a few minutes to review previous learning using their communal notes, pointing to their drawing and words and explaining their "learning path" to each other. During this review activity, students' prior knowledge is activated as they remember the pictures, symbols, and key phrases on the notes from previous sessions. (Wetzels, Kester, van Merriënboer, & Broers, 2011). After the review activity, I start a new session with a two-minute motivational video clip, followed by a minute to take reflective notes based on a given question, ending in group and whole class discussions.

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removing boundaries in note-taking, students are able to consider the subject matter from perspectives that may have been limited through these more structured note-taking activities. During this activity, the focus is on *sharing* their notes. As time allows, students walk around the class to view other groups' notes. In a short time, as they look at theirs and other groups' notes, students realize using different colors and markers is more helpful than using pencils alone to organize weekly learning and for clear visual effect. More importantly, since verbatim note-taking is not expected, they learn to use fewer words to express essential ideas. Students are also reminded that doodling during class is acceptable as long as it helps them focus and process information better. Research on the impact of doodling has indicated that it can facilitate deeper mental processing by reducing daydreaming without detracting from verbal processing resources used for listening (Andrade, 2010). Week after week, students build on previous weeks' notes by using this method, which treats encoding as a creative and expressive endeavor and external storage as a process rather than a one-time review occurring before an exam. The weekly review process embedded in class also helps remember information from recent sessions, with the goal to transfer new knowledge from working memory to long-term memory (Woolfolk, 2009).

In order to aid student learning, when I lecture on a conceptually heavy topic such as the differences between Piaget's and Vygotsky's theories of cognitive development, I deliberately slow my speech to allow students more processing time to think and take notes. I use short key phrases with symbols and pictures representing the concept (e.g. "disequilibrium" with an unbalanced beam) to identify central ideas, and locate 3-D visual aids using a T-diagram on the whiteboard, providing organizational cues as to differences between the two theorists. Before addressing such topics, I remind students not to focus on writing down all the words but to capture only key phrases and ideas central to the presentation. After presenting, I give students time to reflect individually on what they had just heard and written before discussing with group members. Though brief, the time to pause and "digest" the new knowledge through asynchronous reflective note taking accompanied by group discussions is critical, especially when the concepts they have just learned are complex. Organizing central and subordinate ideas and making internal and external connections with the content places great cognitive demand on students (Kiewra et al., 1991). During this phase to make sense of the lecture presentation, students explain their understandings to their peers, which is similar to "thinking aloud," and they hear other group members' perspectives on the same presentation. Finally, at the end of class before I collect the notes for the next session, I give students an opportunity to take pictures of their own notes for those students who are concerned about not taking their individual notes home.

One critical aspect of communal note-taking is that it is inseparable from peer discussions. While students usually take notes first, if something does not make sense, they can turn to their peers to clarify questions. Conversely, after discussing with peers, they often go back and notate additional understanding of the material or new insights they gained from discussions. As socially constructed activities, communal note-taking and group discussions are reciprocated and take place organically in order to aid student understanding and remembering of the concepts. In this model, the presence of the instructor become less important, as co-construction of knowledge with peers takes the center stage and the role of the teacher becomes that of a facilitator during the co-

construction process (Vygotsky, 1978). This is reflected in the physical structure of the class as well: The focus of attention is not on the instructor but the students themselves, as they face one another in their groups. Grounded in the theory of social constructivism, the communal note-taking method accompanied by peer discussions thus becomes an instrument to foster a rich student-centered environment and promote active and continuous student engagement throughout the session and quarter.

In the next sections, two of my students from the spring 2015 course share their perspectives on communal note taking. I invited them based on their deep discussion board reflections about this learning activity, desire to write with me, and differing perspectives. Their experiences differ in that Teresa's was based on her participation in Educational Psychology and Steve's occurred in two separate classes I taught: Introduction to Contemporary Schooling as well as Educational Psychology. Hearing their first-hand accounts and analyses of communal note-taking will add to the understanding of this method.

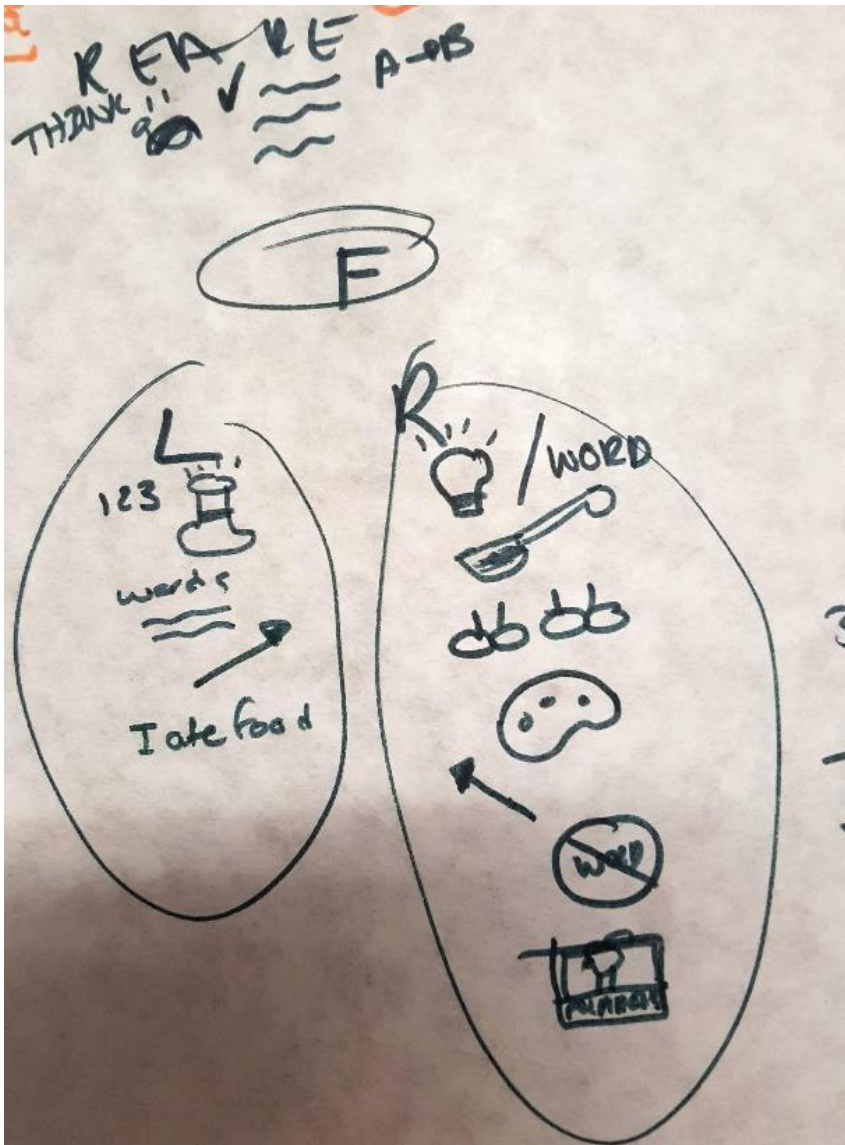
### **Student Perspective One: Teresa**

My initial reaction to the communal note-taking process was one of apprehension. Throughout my K-12 education, as well as my current college career, I have always been taught to write everything down. If something was written on the board or on a PowerPoint slide, I presupposed that all of the information provided was considered important. Consequently, this resulted in a notebook filled with "important" information, but when the time came to having to use all of what I wrote, for example in an exam, most of the time I found myself just *memorizing* what was on my notes from start to finish. Unfortunately, once the exam was over, all of what I remembered was gone as soon as I finished, proving that I didn't really capture what was in the information, but I just remembered it in order to pass the exam. The "memorize-in-order-to-pass" behavior has always been instilled as part of my education and I found myself wanting to emulate it during the first day in Educational Psychology. As soon as the instructor pulled up her PowerPoint presentation on the board, I immediately took out my notebook and writing utensils in order to be able to copy down everything that she presented or said during class. However, when the professor divided us into groups and handed us a large sheet of butcher paper telling us to express ourselves, I found myself dumbfounded and confused. I couldn't understand why I was discouraged to use my notebook and why was I being confined to that sheet of paper. Additionally, the idea of expressing myself without necessarily writing down words didn't make sense: How else would I be able to make sense of what I wrote without giving a definition or a set of words that would explain it? Due to this fear, I found myself initially having to work twice as hard because I wrote down both on my personal notebook and on my sheet of paper every single time. Even though I allegedly had the opportunity to retain the information twice, all that happened was that I found myself working twice as hard without obtaining any feasible results. Once again, I just went back to wanting to copy everything down so that I was able to remember.

In order for me to be able to gain something from this class and from my own note-taking experience, I knew I had to approach this differently. Therefore, I decided that the best option was to leave my notebook aside and to take meaningful notes on my section of the large sheet of paper; these would be in the form of pictures and/or key phrases

that would help me understand the concepts we discussed in class. One of the first instances in which I did this in class was when we as a class reviewed all of the parts of the brain. For this activity, I decided not to explicitly write what each component of the brain contained, but instead drew pictures or wrote some small phrases. This is why I decided that instead of literally writing down that the left side of the brain controls “science,” for example, I would simply write down the word “science” in capital letters and physically position it on the left side of my picture of the brain. According to Kiewra (1988), when one participates in this form of *non-conventional* note-taking, it allows for the note taker to see the “concepts and their interrelationships... represented in graphic diagrams (p.45).” This proved to be true when it came to my drawing of the brain. Because of the arrangement, not only was I able to create a distinct connection, but my peers were able to do so as well. When the time came to discussing my notes with my group mates, I was able to explain my representation without having to resort to solely reading definitions from the sheet. There was an obvious association that the word “science” was important and the fact that it was positioned on the left as well.

I found group discussions of the notes that we wrote and drew on the large sheet with group mates communally helpful. With time I sometimes forgot or couldn’t understand what I had included on the paper. However, being able to interact with my peers gave me the opportunity to revisit and reminded me of what I learned. As I discussed with my partners and they helped me make sense of what I drew, they also made suggestions on pictures that would help me better visualize what it was that I was trying to portray on my notes. For example, with the word “science” pertaining to the functions of the left-side of the brain previously mentioned, one of my partners suggested that instead of writing only the word “science” in big letters, I draw a beaker or a picture of something that I associated with science. Taking this suggestion, I went ahead and erased the word “science” from my drawing and decided to instead draw the beaker that he suggested. Thanks to this, I will always be able to make a clear association with that beaker, which is a symbolic representation of “science,” and the left side of the brain (See Figure 2). As weeks passed by, I found myself moving further away from my old habit of automatically writing down everything in my notebook without thinking to expressing myself more clearly on essential concepts that I was learning.

**Figure 2. Teresa's Communal Notes Drawing of the Brain**

Participating in this experience has allowed me to internalize and express the knowledge that I was provided. When it comes to communal note-taking, these kind of notes are really useful for achieving this purpose. This comes in especially handy when I am expected to perform well on a test or writing a report. As for my personal case, this moment came when I had to study for our midterm exam. The fear of not being able to retain all of the concepts we talked about in class caused me to want to have all of the information within arm's reach. Thus, I took pictures of all of the notes I had made up to that point. Interestingly, I discovered that while I was studying, the notes that I wrote/drew had become so internalized in my memory that I did not need to take a look at the pictures to be able to understand them. While I did remember them, it wasn't in a manner in which I only remembered what the definition meant. Instead, I was able to remember a picture or key phrase, which helped me to be able to apply the concepts on the questions posed in the exam. Revisiting the example of the brain once more, there

was one question on the midterm exam based on a scenario in which I as a teacher had to find out what side of the brain worked best for the student and how I could use his strengths to build skills in the language realm. I remember vividly not having to go back to my notes, or in this case the pictures, because the image of the brain I had created on that sheet of paper was so ingrained in my memory that I did not need to take a look at my notes. I just closed my eyes and I was able to visualize it.

The communal note-taking process has granted me the possibility of venturing into the world of possibilities that exists outside of passive note-taking. While I believe it is true that in order to learn information one must be able to have a way in which to write it to be able to remember it, the way in which this is done must hold meaning for the participant. This is not to say that for some just writing a word or two helps in the learning process, but it is also important to understand that what might work for some does not necessarily work for others. Whether students find it fit to write down a couple of sentences or expressing the information they have learned with a picture, what matters is that they are able to do so as members of a community in which learning doesn't take place in isolation, but instead where they are encouraged to interact with their peers to make sense of what they are presented with and to be able to teach other what they have learned.

### **Student Perspective Two: Steve**

The nature of the subject matter and the classroom culture played a role in creating a unique approach to note-taking in each of these classes. Introduction to Contemporary Schooling served mainly as a survey of the modern climate for teachers and the issues and obstacles encountered in their chosen profession while Educational Psychology is much more rigorous intellectually as it tackled the dominant theories of child development and learning. While communal note-taking was a positive experience in each of these environments, the format had a more profound effect in Educational Psychology because it allowed me to create a visual map of the relationship among complex theories of Piaget, Vygotsky and Kohlberg, among others. Rather than treating each of these topics as an isolated idea, I was able to create a tapestry that fostered a thorough understanding of these root concepts and ultimately assisted in the creation of our own teaching philosophies.

As Teresa related from her experience, I was hesitant when this new method was introduced. I was clearly shepherded into standardized forms of note-taking during my K-12 experience, and the introduction of a different toolset for note-taking such as markers and butcher paper typically represented an unfamiliar activity in the classroom setting. As a means of introduction, the professor shared a video on "divergent thinking" that presented detailed illustrations of relationships between key concepts. Although this was not emphasized heavily as a direct model for communal notes, it was presented immediately adjacent to the first note-taking activity and offered a strong example of the format's potential. Following this model, I felt more empowered to explore my own ideas in a visual medium before settling on a personal approach. Ultimately, the success of this format relies heavily on students gaining this confidence to express new knowledge in their own words and drawings. Once this obstacle is overcome, the format yields many benefits over more traditional note-taking methods. Research by Kobayashi

(2005) found that note-taking approaches that used paraphrasing and summarizing produced deeper semantic processing, while verbatim reproduction does little to stimulate thinking. Communal note-taking furthers this method of thinking by driving students to make complex representations of ideas within the moment of learning. In doing so, it concurrently reduces the detrimental mechanical demands of note-taking as identified by Kiewra et al. (1991) such as spelling, grammar and notation style that diminish the immediate connection between the teacher and student.

The second aspect of communal note-taking is discussion and personal reflection on the topics captured on the large paper. My experience working within the small group environments was overwhelmingly positive and nurturing in a manner that promoted expansion of ideas and deeper reflection, particularly when dealing with more difficult concepts. During a discussion of the principles of Piaget and Vygotsky, for example, I was able to reinforce my understanding of the material by first recording my personal notes on the communal paper, discussing the concepts with my group and then amending my notes with additional diagrams to emphasize relationships between the two that my group stimulated. Although there was healthy debate, group members asked pertinent questions and offered support when sharing ideas. Every group member had the opportunity to share and clarify his/her understanding of concepts studied. Furthermore, personal representations of notes were always respected regardless of artistic ability levels.

In the past, I viewed note-taking as a passive activity, during which I would capture all necessary information from lecture so that I could reflect upon it and commit it to memory on my own time. I never considered that this activity could be constructed to become a generative function capable of developing complex thought immediately in the moment of learning. Kiewra et al.'s (1991) studies demonstrated that students directed to record generative notes were incapable of doing so in many cases. The flexibility of communal notes is a key characteristic that allows students of any learning abilities to create meaningful translations of material in their own rendering. The discussion of these representations permitted me to see differing interpretations of the material that reinforced my understanding by incorporating alternate perspectives. As a student who typically identifies as a verbal-linguistic learner, I increasingly found myself stretching to share my ideas in a visual format because it required me to process the information more deeply and deliberately in the company of peers.

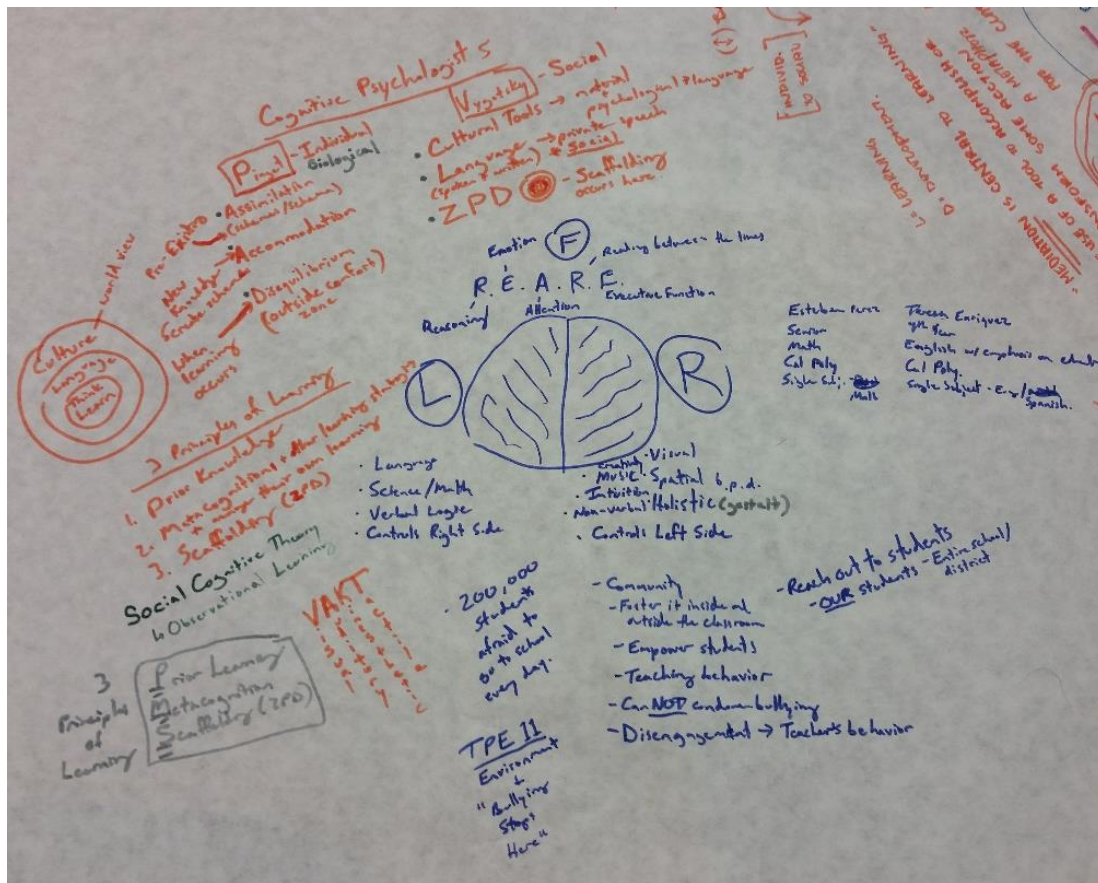
One standout activity within the Educational Psychology curriculum was the detailed breakdown of brain function described by Teresa. Following a kinesthetic activity that provided an overview of the brain's geography, we were given time to take notes and reflect in our groups. This activity stood out because it centered on a more concrete scientific model of the brain's function rather than theory. In this situation, the reflection process correlated strongly with research by Chi, de Leeuw, Chiu and Lavancher (1994) that showed particular success in learning complex structures through visual representations (p. 441). I encountered the process of self-explanation repeatedly while learning the details of brain function through the personal creation of visual representations and the verbal clarification of ideas that allowed me to assign deeper meaning to the complex processes. The brain model taught during this activity

demonstrated the impact of communal notes not just in terms of theoretical musings, but in the understanding of fixed scientific concepts.

One major difference between the two classes in which I experienced communal note-taking illustrated the limitations in students' willingness to adopt this new format. While Introduction to Contemporary Schooling was focused on presentations and essays, Educational Psychology included a mid-term exam. In the two weeks prior to the exam, I felt an anticipatory anxiety at my lack of traditional notes from the classroom sessions to use in preparation for the exam. Although the professor always allowed students to take pictures of the communal notes at the end of class if they chose to, as Teresa previously mentioned, the trained response of the K-12 experience made me feel as if I was at a severe deficit without exhaustive notes regarding every detail of the subject matter. These concerns were alleviated by a review session one week before the actual exam that allowed me to demonstrate the depth of my knowledge in a practical format that mirrored the exam format. My experience preparing for the exam mirrored that of Teresa in that my knowledge from the repeated discussion and reflection on the visual representation of these ideas made the physical notes virtually superfluous. Therefore, I did not need to refer back to my photos of the notes when creating my study guide. I found during my studying that the knowledge had transferred successfully from my working memory to long-term memory through constant reflection during class, which was supported by my success on the exam.

Adjusting to the communal note-taking format required a transitional period to acclimate to the process. Apprehension toward adopting a radically different method was the most obvious obstacle, but more practical issues also became apparent as we worked. In one class, two artistic students immediately dominated the note-taking space on the large paper, not understanding that the sheet was a long-term tool that we would be using for weeks rather than a single class activity. Although these efforts were wonderful to look at and definitely aided in future recollection of the notes captured, space quickly became scarce. New ideas had to be tucked into nooks and crannies on the paper, which made it difficult to draw connections between different concepts through visual representation. My other group skewed toward the other end of the spectrum, with individuals staking claim over small separate plots in the corners of the page, with the center real estate largely unclaimed. These problems corrected naturally as we adjusted to the format. When we received a clean sheet of paper a few weeks into the class after exhausting the space, we regulated the space more judiciously. Additionally, my groups in both classes became more open in sharing verbally, as we became acquainted over the course of the class. For example, my lack of confidence in my handwriting and drawing skills ceased being a hurdle for me. Sharing my perspective began to take precedence and I openly expressed my ideas on the page rather than hold back for fear of how they would be judged by the group. Everyone seemed to rally around the common goal of processing and capturing the new knowledge in words and pictures we could understand rather than getting hung up on personal insecurities (See Figure 3).

Figure 3. Steve's Communal Notes



From my personal experience, the real power of this new note-taking method was twofold. First, the note-taking was never an isolated experience. The notes were tied to discussions with my fellow group members that enabled me to reflect and digest the material in the moment of learning, rather than capturing facts to be memorized later on my own. The creation of meaningful discourse gave me concrete examples and visual aids to anchor this knowledge. The second aspect of this note-taking method that I found inspirational was seeing the immediate impact of social constructivism in action. Each group I participated with created a wholly unique pastiche that was unavoidably representative of the members of the group. Simply watching the notes take shape helped me learn the material while getting to know the individuals in my group far beyond the surface level. Diverse viewpoints were always welcomed within my group as they offered immediate feedback from a different perspective while ideas were still forming. For this reason, a multicultural makeup offered optimal results. Periodically, when the instructor gave us the opportunity to walk around the class to view the notes of other groups, it became clear that each group formed its own balance as a group. For these reasons, I would not hesitate to find ways to incorporate this approach as appropriate within my own classroom when I start teaching.

## Potential Limitations of Communal Note-Taking

As shared by Teresa and Steve and many students in class, this method of note-taking made them uncomfortable initially, since it moved away from the traditional method of note-taking and forced them to think differently about the very purpose of the note-taking practice. Because of the unconventional method rooted in social constructivism, in a fast-paced quarter system or intensive summer course, students may not have sufficient time to get used to this method, as it requires more time to sink in and allow them to fully develop their own style of representing thoughts. Another potential limitation is in taking the notes home. Some students expressed their frustration in class, especially at the beginning of the quarter up to the mid-term exam. Although students were able to take pictures of the communal notes at the end of each class session, without an individual notebook that gives students a sense of security, some students expressed their anxiety such as Teresa and Steve. This is where each individual instructor can explain the purposes of this method of note-taking transparently and adapt it to the unique needs of his/her class, since it is not a fixed model. For example, the large sheet can be modified into smaller sheets like puzzle pieces, which would provide a more transportable format for individual students.

## Benefits of Communal Note-Taking

The differing experiences of the two students highlight the versatility of communal note-taking, which allows students to create unique final products that reflect their own experiences blended with the input of their fellow students. However, many common themes ran throughout the individual experiences. Both Steve and Teresa initially had reservations toward the new method of note-taking due to their reliance on traditional note-taking methods learned earlier in their schooling. Their reticence was short-lived as they became acclimated and understood that their learning in the class would be enhanced through group discussion. Communal note-taking reaches beyond an isolated learning experience and creates learning relationships that result in greater depth when actively internalizing concepts learned in class. This process achieved added impact by pushing both Teresa and Steve beyond their comfort zones to incorporate alternate modalities of learning within the social construct such as visual representations that broadened the scope of learning. Their shared experiences offer support for the universal benefits of communal note-taking.

From the instructor's perspective, this method of note-taking yields multiple benefits. First, not only did this activity serve as a springboard to spur current discussions, but it became a method to review key concepts students learned from previous sessions. The group review embedded at the beginning of each class session treats external storage as a *process* rather than an isolated *product* occurring before evaluations. The spatial visual artifact physically placed in front of the group each week continuously reminds them of their past learning experience, which helps internalize the new knowledge in the long-term memory as meaningful chunks of information. This was accomplished through a tangible "cognitive map" that students created each session to trace back their thinking and learning to previous weeks. I did not have to repeat the same presentation, but I could guide students by simply giving this prompt: "Use the sheet in front of you to teach your group members what you learned last week." Since students often

remember what they and their peers drew and shared previously, they are able to activate prior knowledge during the review process, which prepares them to connect to the new knowledge they are about to construct in class (Wetzels et al., 2011).

Another benefit that emerged from this experience was the reciprocity between group discussions and note-taking both founded in social constructivism. As the two students voiced, these two activities complemented each other. Rather than treating them as isolated endeavors, note-taking used in conjunction with group discussions provided coherent socially situated learning activities that enabled students to continuously express their understandings with one another, using a variety of written and verbal means. Each individual voice contributed uniquely to the group's dynamic with differing perspectives and expressions. These socially constructed learning activities inevitably engendered vibrant discussions, which helped students organize their thinking and learning in the company of peers.

Finally, and most importantly for me as the instructor, I began to see gradual changes in my students' thinking about the whole notion of note-taking. As Teresa and Steve pointed out, when students walked into my classroom at the beginning of the term, they were conditioned to automatically copy whatever was on the PowerPoint. In fact, they were desperate not to miss a single word before I turned to the next slide! Here I saw the "damage" that has been done during their K-12 and university years: Note-taking as merely a passive act of learning. To undo the damage and rethink note-taking as an active endeavor situated in a social context was a major paradigm shift. As the two students shared, when they first attempted this generative method of note-taking that required deep and creative encoding, they were very uncomfortable. There were hardly any drawings or writings on the sheet. However, as students continued to participate, I saw changes taking place. The empty space on the large sheet began to disappear and became filled with pictures of a brain, T-chart and Venn diagrams of Piaget's and Vygotsky's theories, and phrases that were meaningful during class. By Week 5, some of the sheets became so full that they had to use another sheet.

Seeing the transformation in students' active participation through group note-taking and discussions from the beginning to the end of the ten-week term, I realized that this communal note-taking method served as a tool to foster a rich student-centered environment causing deeper learning and reflection among students. It is by no means a fixed method but an organic method with procedures that can be shaped by differing students' needs, course content, class size, and many other dynamic factors in the classroom. The true power of this method rests on the socially constructed process of learning in which students become active agents of their own learning as they co-construct knowledge with their peers. This is in stark contrast to teacher-centered learning in which instructors play the primary role as the dispenser of knowledge that treats students as passive recipients of learning. The communal note-taking method experienced by Teresa and Steve point to the need of such a tool to promote deeper thinking and learning in the classroom. After all, note-taking is "not an objective by its own right but a tool and an aid for learning" (Makany, 2009, p.621). Questioning the very purpose of note-taking may be the first step instructors and students can take to improve learning experiences among students.

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