

Linking experiences with emotions and the development of interpretive repertoires

Norah I. McRae

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Abstract In this paper I consider the case of one student, Todd Alexander, through analyzing the transcripts of his interviews between him and his teacher (Wolff-Michael Roth). I examine the role that emotions play in the development of the interpretive repertoires that Todd employed as he talked about his scientific and his religious beliefs. I identify how lived experiences support the development of emotions and what educational conditions are necessary to allow for appropriate lived experiences. In so doing we might be able to support educational conditions that result in interpretive repertoires that allow for acceptance of multiple perspectives with a moral grounding, leading to students who are well positioned to be valuable contributors to society.

Keywords Emotion · Hands-on learning · Ethico-morals · Discourse analysis · Social constructionism

The basis for this paper is derived from the epistemological materials provided of the reflections of Todd Alexander and the transcripts of conversations between Todd Alexander and Wolff-Michael Roth who was his teacher at the time of the conversation. The focus of this paper will be the link between the hands-on application of learning and the development of the emotional-volitional and ethico-moral dimensions (Roth 2007) in a student and why it matters.

The analysis will be based on the transcript found in the Epistemology II project interview between Todd Alexander and Wolff-Michael Roth. This transcript was made during a two-year long study at a private all boys school in central Canada. The purpose of the study was to determine physics students views about knowing and learning. The theoretical foundation of the study was derived from discourse analysis and the idea that speakers make tenuous statements and then back these statements up with additional statements that they consider unquestionable. These unquestionable statements are their

N. I. McRae (✉)
Curriculum and Instruction, Faculty of Education, University of Victoria, Victoria,
BC V8W 3N4, Canada
e-mail: nmcr@uvic.ca

“discursive resources” and these resources are pulled from a set of “interpretive repertoires” (Edwards and Potter 1992). The study then analyzed these repertoires and through that analysis determined how the students could either reconcile or not reconcile their religious and scientific beliefs. One focal point of the study was to examine the interpretive repertoires used by a student Todd Alexander, and identifying that within the two repertoires identified of “rational” and “subjective” whether the student favored a social construction or an absolute approach (Roth and Alexander 1997). Todd used a social construction approach (an epistemological claim) in his talk about science both in rational and subjective terms and in his talk about religion in rational terms. In his talk about religion in subjective areas he makes absolute statements (an ontological claim). These approaches seemed to give Todd the ability to reconcile his religious beliefs and his beliefs in science and give him an important spiritual resource to call upon when making difficult decisions.

In this article, I consider the question of whether Todd’s self-identified preference for a hands-on approach to learning (the “third level of learning” as he defines it) leads to the experiencing of positive emotions that then allowed him to be more open to multiple viewpoints and an inclination towards social construction and an ability to have some sort of spiritual resource to guide them. If this can be shown to be the case then the implications for education could be significant. The world needs people who have a high degree of tolerance for ambiguity and yet also have some moral compass (whether based in religious belief or not) to help them navigate this ambiguity using an ethico-moral value system. An analysis of this sort is important as it may help shed light on how we can create educational conditions that develop students who are better able to tackle life’s complex problems while still connecting with their humanity and the humanity of those around them. This analysis will examine the question of whether one way to link a student’s knowledge to their humanity is through opportunities to attain this “third level” of learning—or applying learning in real-life situations. In doing so the emotional-volitional dimension of the learning experience might be made evident, and the student could therefore be open to also developing an ethico-moral dimension to this experience depending on the context where this learning experience occurs.

In this paper I adopt the same assumptions used in the original study, i.e., that beliefs, attributes, ontologies, epistemologies are discursive achievements (Roth and Lucas 1997). This implies that language, or what is spoken, does not in and of itself represent reality, but rather “constitutes, maintains and reconstitutes it.” This concept of the role of language and its use in helping us discover our identity (Self) and communicate ourselves in relation to the Other is supported in the thinking of Derrida who made links between lived experience and language (Derrida 1998) and the philosophy of Bakhtin (1993). Bakhtin believed in the importance on an individual’s worth, the hidden soul and the “unfinalized self.” The human and social experience, as demonstrated by the use of language, is dynamic and relational. Supporting the connections that can be made in analyzing conversation is the thinking of Vygotsky who claimed that emotions are at the very heart of thought, and that these emotions, expressed through conversations, formed social relationships that are the building blocks of all higher cognitive functions (Vygotsky 1986). Through using an analysis based on what is being said we can come to understand a person’s lived experience and through that identify some useful concepts to build our shared understanding of the world around us. As a result, there is benefit to analyzing discourses. Talk can be analyzed as it is available, accountable, situated and embodied and as such is both the “terrain/context and tool of human activity” (Roth 2008, p. 35)

Emotional dimensions of science, religion, and learning

Throughout the interview, the role of emotion in science, religion, and learning is quite evident, as we can read in his description of preferred ways of learning. The idea of hands-on application to learn concepts is introduced by Todd in his reflection entitled “Who Knows?” where he describes his theory of learning based on what he calls “levels.” The first level is when a student memorizes and regurgitates facts from a textbook or lecture without really understanding them, the second level is when the student understands the material and can apply them to problems from the text or set up “perfect problems.” The third level is what Todd describes as the level “obtained when this idea can be taken with me outside of this ideal world into life and used to solve non-classroom related problems.” He equates the attainment of level one as being equivalent to what a computer could do, and level two as something a higher level computer that has been programmed could do, but level three he identifies this as knowledge which is “selectively human,” and he goes on to call this “type of knowledge the most useful and pure” and that if he can apply it successfully then he knows what he has learned is “useful and I have an ability to use it as a human.”

Whereas this notion of “third level” learning is introduced in Todd’s reflective essay it is discussed in greater detail with his teacher during the follow up interviews. There are several examples of the transcribed epistemology that demonstrate the link between the application of knowledge, an experience, and Todd’s emotions.

Todd: I try to do the third level, but it is tough, as it is difficult to actually take a part of science, a part of what we call concrete textbook science and take it outside but if you do it, you can do it, you realize that you

MR: but you did it in a sense

Todd: when we did the labs

MR: when you do your own labs and when you decide

Todd: I like that, and it gives us some independence too

MR: ya, because then you can work at the third level, because you always apply your

Todd: knowledge.

In this passage Todd states that he “likes” this application of knowledge and it also gives him “some independence” which is articulated as a positive attribute. Even though Todd acknowledges earlier in the excerpt that it is “tough” and “difficult” to do he makes the case that it is worth it because of the deeper learning and sense of independence—or control over his own learning. Further in the conversation the following interaction occurs after Todd has explained how he prefers to first “experience” a concept through a lab exercise prior to seeing the concept in a textbook:

MR: so you first want to see them?

Todd: it’s easier that way, I find than just memorization

MR: what in terms of interest, how is it more interesting? Or what is more interesting?

Todd: well that way, if you do the experiments, you think a lot about the experience, you are doing something you wanna know, and you are asking questions you wanna find out instead of being told something and then trying to figure out how it applies, I remember there is the curiosity level like you are saying how does this work, and figure something out instead of getting something and having to apply it to something

MR: but if you had to you could learn a subject, I don’t know, whatever it is, it doesn’t even have to be science from the textbook

Todd: ya, which would be annoying and boring

MR: because basically you wrote in the essay that may be leads to level, tier 1 or tier 2 learning.

Todd: and you'd pass the course and you'd get and A in it, and it wouldn't be of any value to you. When you get into life, regurgitating a textbook isn't gonna help you.

Todd refers to this way of learning—an experience as “easier” and his preference. Interestingly, in a previous segment Todd had indicated that experiences were sometimes “tougher” to apply, but here he articulates how understanding the concepts is made easier through application. So even if learning through an experience is both “tougher” and “easier” in Todd’s case, it is still seen in a positive light. When the interviewer probes Todd about interest he goes on to identify that when he has a lab experience he is doing something he “wanna” which speaks to his level of intrinsic motivation. Tapping into this intrinsic motivation feeds his curiosity and interest in the subject. Not having this opportunity, which would limit learning to Level 1 and Level 2 as categorized by Todd, is viewed by Todd as “annoying and boring” and “wouldn’t be of any value” and would not be able to help Todd when he gets “into life.” This section links Todd’s applied learning to positive emotions and his belief that this approach will better help him in “life” and the emotional-vocational dimension is made explicit.

Todd has a strong sense of what he thinks the value of an education in science is. Thus, he states that “God has given us the mind in order for us to do what is good and what is right for the betterment of the world and for each other, and science is very much an aspect of that.” In this statement Todd identifies the volitional aspect of an education in science. For him it is about using the mind he was given to learn science in order to make the world a better place. Experiencing a science education then is more to Todd than feeling positive about it. Its value also comes from providing him with a deeper understanding so that he can make the difference he wants to make. This segment also then begins to reveal Todd’s ethical and moral position.

On page 11 Todd and the interviewer are engaged in a discussion about truth and what truth is. Todd states: “truth is more on an emotional level, a spiritual level, not so much on a factual level, that, it changes so quickly, so rapidly in the modern world.” For Todd he makes the connection again between knowing something and an emotional response that confirms that knowing for him. Here we can see an example of how emotions play a role in his rational repertoire, allowing him to take a social construction approach to navigate the transient nature of truth.

Further in that segment of the conversation the interviewer asks Todd about how he might determine which truths are right from a moral and ethical point of view:

MR: you sort of mentioned, and I had in mind the moral and ethical that you mentioned, but is there moral and ethical are there truths, are there things that are right?

Todd: yes there are

MR: but who sets these?

Todd: it's on a personal level, no one sets, a different God, we know at a personal level, each of the human beings is, you know within yourself what is right and what is wrong and, it is kind of being, it's part of having God within you.

In this exchange Todd articulates his view of how each human has a built in moral compass that is an expression of God within—a fundamental depiction of what makes him human and an absolute position to guide him. Here we see evidence of the “absolute” approach to his repertoire that helps ground and guide Todd. This further supports a claim

Todd made earlier in one of his reflective essays and connects his belief in God to an emotional experience rather than cognitive understanding:

I mean like look at intangible things, like love and beauty, and I think that equates to God for me, because, I mean these things, you don't understand why, but you know that it exists, you know certain things are beautiful, and you know you love certain things, like you can't explain why, you just do, and there is no scientific approach to it, and that becomes part of the religious thing it's almost like an emotional side, an emotional spiritual side to it, I mean everyone's got one, I get that with my religion.

Given his previous comments we know that he considers this spirituality that guides his ability to discern right from wrong as being founded in emotions. It is through this exchange that we see the ethico-moral dimension in Todd and note the link between his emotions and this dimension. It is important to emphasize at this point that the emotions aroused in Todd are positive ones. He equates God to "love" and "beauty," all of which are very powerful, positive images.

As the interview continues, Todd and the interviewer begin to discuss who should be making moral and ethical decisions around such issues as genetic engineering and how Todd would be guided should he be working as a scientist or a doctor. Todd describes how he would make these difficult decisions:

Todd: you have to look inside yourself, you have to look at all the aspects, and think about it clearly, because ultimately you can find it only inside you, then its not so much a cognizant thing, it's an emotional thing, a spiritual thing

MR: so inside you is spiritual, emotional, but also God?

Todd: ya, that's where God is

MR: and that's where you would look

Todd: ya, that's where you have to look. That's when you know, that's where the right is.

Again we see Todd making the connection between emotions, volitional choices, ethics and morals. He would have to "think about it clearly," so use his cognitive abilities and knowledge, but then ultimately be guided by his emotional side to make those difficult ethico-moral decisions. In his subjective repertoire about religion he relies on an absolute construct to help guide him, and one that has emotion at its core. We know from previous excerpts that it is not just any type of emotion that is critical, but positive emotions.

We can see how Todd clearly identifies himself as a religious person. He goes further to link his identity to a specific faith (Christian) and church (Anglican). His affinity to the Anglican church also seems derived from an emotional base:

I am very Anglican, very Anglican, for me it is a spiritual, I am attached to the church, and for me there is so much more, I draw so much strength from the church, there is this, my faith lies there and there is so much power and strength that I get from the church, so I have to, it's an emotional thing, I feel that, I don't get that in another church.

This segment of the conversation links his emotions to identity and an identification with a specific institution associated with his faith. Again, these emotions have positive connotations, he uses words such as "power" and "strength," he is "attached" to his church, which gives him "so much strength." Why the Anglican church? It generates an emotional "thing" that he does not get "in another church." Being an Anglican is part of

his identity and rooted in an emotional response. In this statement is Todd's absolute statement within his subjective repertoire of religion, again emotion seems to be an influencer.

Todd and the interviewer go on to talk about the role that religion plays in connection to culture and the differences displayed by people from different cultures with regard to religion:

MR: would you then see that there are cultural differences?

Todd: the moral and ethical are basically pretty close, the culture is rather different, it's a shame that we are so emotional, because it's such an emotional thing they take it so personally and they get so upset with it that they fight each other.

In this exchange Todd's comments again make the link between emotion and cultural differences around religion. It is also interesting that Todd identifies the negative side to emotions and how that can lead to conflict. He talks about people with different religious beliefs taking things "so personally" and getting "upset." Here Todd illustrates his use of social construction in his rational repertoire of religion. Perhaps Todd's ability to see how negative emotions can create harm under the name of religion has enabled him to take a social construction approach and avoid an absolute approach in his rational repertoire of religion. In discussing what is sometimes viewed as a contradiction, the belief in science and the belief in religion, Todd and the interviewer talk about how Todd is able to be able to reconcile both himself:

Todd: for me it's not a threat but for other people, it becomes, they feel it as a threat

MR: but do you think that is because they don't understand science?

Todd: ya, I think very much that they are ignorant of science I think we should have said that the people in science who are atheist have not had a good experience with religion or either they became so rational that they ignore the emotional and the spiritual side, which can be done.

Todd's articulation of how he is able to reconcile his beliefs in both science and religion are grounded in a positive experience. He talks about scientists who are atheists are such because they have not "had a good experience with religion." Todd's experiences with both science and religion have elicited positive emotional responses in him and as such provided him with the ability to reconcile these two potentially contradictory belief systems. This experience allowed, for Todd, the link to positive emotions, which he has stated is the basis for his spiritual connection:

Todd: why the sky is beautiful, everyone says, so many people agree on it that's basically a fact, but it doesn't explain it, it's just energy, it's emotion, it's spirit

MR: so it is spiritual, and that's where you draw on, that's probably liken to God

Todd: ya, the energy, the spiritual, the emotional, it's there.

It might be that to use Gilbert and Mulkey's (1984) *truth will out device* concept, Todd is able to articulate his reconciliation of two conflicting repertoires through being guided by his emotional senses. Having had positive experiences both in his exposure to science and in his exposure to religion has provided him with an emotional predisposition inclining him to find congruence with both sets of beliefs.

The circumstances of Todd's educational experience are relatively unique. He is part of an exclusive boys school where the tuition is expensive. The expectation of families sending their sons to this school is that they will be well prepared for further post-secondary studies and careers of influence. The school provides not only a focus on an

academic experience, but also a religious experience. Students are expected to attend chapel regularly and to fully participate in the Anglican church of the school. Most families sending their children to this school want them to have a religious context for their education. Todd himself comes from a religious home and during the course of the interview talks at some length about the religious beliefs of both his mother and his father that have clearly influenced him as he freely expresses his Christian beliefs and his specific identification with the Anglican church. Todd goes on to talk about the context in which he has had these positive experiences that have provided him with a space to reconcile his belief in science and his religious beliefs:

Todd: I've been brought up in a household, in a school where they've been wanting to be part of each other, where science and religion, I mean I go to the chapel in the morning and then to physics class and back to chapel, where it has just been with each other and they have been a part of each other and I draw from both places, so my parents, have put them also together, so I have always grown up with them being unified, so I really didn't feel that conflict.

This context has provided Todd with an environment that has supported his belief in science and his belief in religion, "they've been wanting to be part of each other." This has allowed him to draw upon both to understand the world and to give him a place to consider both scientific principles and ethico-moral ones. He is able to "draw from both places" and "have always grown up with them being unified." Due to the positive emotions he associates with both his educational experiences and his religious experiences this results in his not feeling "that conflict."

Despite this integration of the two beliefs Todd goes on to relate that it his religious beliefs, energized by his emotions, that helps him solve problems:

Todd: I find that when we have problems, we draw on our religion not on science, science is there just for man to use, but there is not the energy in it: like when we have problems and difficulties you draw on your religious and your spiritual side, when you have a problem you look at your religious side you are not looking for a textbook, you don't read a book about it, you look into yourself, or I do at least.

Again we see that Todd is guided by his spiritual side, which is fueled by emotion, especially when faced with dilemmas. He acknowledges that his cognitive side does not help him navigate these waters: "you don't read a book about it, you look into yourself, or I do at least." When Todd refers to "energy" to him it represents his spiritual beliefs that are linked to emotions: "Yea, you draw so much energy and so much strength from somewhere, and I don't think. It's gotta be, it's gotta come from an emotional level, spiritual basis." This demonstrates again the link for Todd between a positive experience, a positive emotion and the ability to exercise his beliefs, his volition, in that way that defines him as a human being able to make ethical and moral choices.

Revaluating the emotional-volitional and ethico-moral dimensions of learning

The importance of the emotional-volitional and ethico-moral dimensions of learning and in the development of identity are explored in this paper (Roth 2007). Roth's work has shown that these dimensions are only deployed through concrete actions or the lived experience of praxis. In the analysis of Todd Alexander we examined his lived experience in learning science through his "third level" and his lived experience as an active

religious person. Both of these conditions created positive emotions in Todd. In the first instance he had positive emotions towards the learning of science, in the second instance he had positive emotions in his religious experiences both at school and at home. According to Vygotsky (1986) we need to consider the role that emotion plays in relation to motivation and the formation of the multiplicity of identity depending on context. By examining the role that emotion played with Todd and considering previous work on the interpretive repertoires that Todd uses, we can make a connection between the influence that Todd's experiences (be they educational or spiritual) had on the triggering of positive emotions that led to their development of his interpretive repertoires of social construction and absolutes. These repertoires enable Todd to allow for multi viewpoints and have a moral compass to guide his decision-making. This supports Roth's claims that through providing students with learning opportunities that help them develop the emotional-volitional and ethico-moral dimensions they will develop science (in this case, but any subject) related dimensions of identity, build their "practical wisdom" (Ricoeur 1992), and create a greater appreciation for their discipline in the long run. Roth's work also points out that these learning opportunities need to be involved in something for the common good to enact emotional-volitional and ethico-moral dimensions and a "judicious application" of concepts and theories. In the case of Todd Alexander, his context is a school and family where strong and positive religious experiences are provided and reinforced. This context provided Todd with the grounding for his ethico-moral stances. In a more generalized sense, an ethico-moral grounding can be found in a number of contexts, not only religious ones. Many organizations are involved in work for the common good that are based on humanitarian principles that are not based in religious belief. These too could provide nourishing ground for the development of this dimension in students.

This analysis has revealed an additional element to the work done on how students might formulate their discursive repertoires. There seems to be an element of emotion that acts as an underpinning to these repertoires, whether they be rational or subjective and whether related to scientific knowledge or religious beliefs. Emotion as an important consideration was also reflected in the work of Ricoeur (1992) who considered emotion as the driving force behind the development of self-esteem, and that self-esteem was an ethical aim for humans. The role that emotion plays seems to be that of a thermometer that allows Todd to gauge whether his repertoire feels right for him. It confirms for him that a social construction approach or an absolute approach works best for him. It is neither too hot nor too cold, but just right. If the emotions are positive then the position of the repertoire is comfortable, if the emotions are negative then the repertoire needs to be adjusted or there is discomfort. As educators we have a range of possibilities to create positive emotional experiences for our students. One powerful method for doing so could be through providing opportunities for students to apply their learning in a hands-on practical manner. Todd's experiences of learning in this way gave him a deeper appreciation for the science he was learning, triggering positive emotions and leading to the strengthening of his ability to take a social construction approach to his scientific discourses be they rational or subjective. It might be the case that for a student such as Todd, providing him with even more opportunities to apply scientific principles in practical hands-on work that is for the common good would further strengthen his repertoires and provide him with even more abilities to reconcile his scientific and religious beliefs. Not only would he be learning at his preferred "third-level" but he would be doing so within a moral context which is clearly important to him as a human being.

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Author Biography

Norah I. McRae has a BA (University of Alberta), MBA (University of Alberta), PhD (in progress, University of Victoria). She is the Executive Director of Co-operative Education Program and Career Services at the University of Victoria. During her time at the University of Victoria, Ms. McRae has presented conference papers on the following subjects: student preparation on-line, international co-operative education, enhancing the student learning experience, co-operative education and student engagement, integrating learning from co-operative education back into the classroom. Ms. McRae's publications include an article in the *The Journal of Co-operative Education* entitled: “Preparing for the Work term: On Line” and co-authoring a chapter in *The International Handbook for Co-operative Education* entitled: “Co-op Programs in Business and Finance.”