AC 2012-3119: SUPPORTING SELF-AUTHORSHIP DEVELOPMENT: THE CONTRIBUTION OF PREPAREDNESS PORTFOLIOS

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Supporting Self-Authorship Development:
The Contribution of Preparedness Portfolios

Abstract

Recent calls for changes to engineering education have resulted in the implementation of various pedagogies (e.g., problem-based learning). These calls have even stemmed the emergence of a variety of new and innovative pedagogies, such as preparedness portfolio. While these pedagogies are a promising first step toward improving engineering education, it is important to find ways to evaluate the effectiveness of these pedagogies in a comprehensive and holistic way. This study employs a specific student development framework, self-authorship, to analyze the effectiveness of a specific pedagogy, creating preparedness portfolios. Self-authorship unites different areas of student development (i.e., intellectual, identity, and relationship) to produce a holistic analysis and also because scholars in higher education consider development toward self-authorship to be a main mission of higher education.

The purpose of the study was two-fold: (1) to determine whether or not (and in what ways) the portfolio experience helps students become self-authoring individuals; and (2) to make some observations about the effectiveness of the self-authorship framework as a means to evaluate pedagogies in general. To address these purposes, we engaged engineering undergraduates in creating preparedness portfolios in which they looked at their future in light of past experiences. Our findings suggest that creating preparedness portfolios does support student development toward self-authorship. In addition, through this work, we have identified some strengths and some limitations of the self-authorship framework as an analytical tool to assess new pedagogies.

Introduction

Scholars, policy makers, and industry leaders challenge the engineering education community to reconsider the ways in which we recruit, retain, and educate future engineers.[1-3] These calls for transforming engineering education have resulted in the adaption and implementation of a variety of innovative pedagogies, such as problem-based learning, cooperative learning, and portfolio construction. In order to better understand the educational benefits of these innovative practices, researchers and educators use a variety of evaluation techniques. One potentially significant technique is the use of student development toward self-authorship as a lens through which to assess the educational value of these pedagogies.

Broadly defined, student development refers to the ways in which students grow and mature. It also includes the exploration of how students make meaning of the world. The self-authorship framework is a holistic approach to student development, which brings together intellectual, identity, and relationship development. Within this framework, intellectual development refers to the ways in which individuals construct meaning of the world and gain knowledge; identity development refers to a process of securing and trusting an internal compass; and relationship development refers to maintaining one's internal compass, while engaging in mature relationships. In order to support student development toward self-authorship, educators first must be aware of the importance of student this construct.

More specifically, one strategy that has been shown to both challenge and support student development is reflection—making meaning of past experiences. Reflective activities that encourage and challenge students to engage with difficult and often murky areas have the potential to support students as they grapple with various issues, such as values and beliefs. Moreover, researchers have shown portfolio construction to be a promising mechanism for engaging students in reflection,[4] thus indicating that portfolio construction is a means to support student development toward self-authorship. In our work we had engineering undergraduate students construct preparedness arguments in the form of an online portfolio. In these preparedness arguments, students articulated their readiness for future engineering practice based on past experiences. We are particularly interested in the educational significance of preparedness portfolios when constructed in a studio setting. In order to do this evaluation, we need a framework that adequately and accuracy captures students' experience.

Through this research endeavor, we are (1) providing background on the concept of self-authorship and related student development frameworks; (2) describing our methods; (3) presenting our findings; and (4) concluding by demonstrating how the findings relate to a using self-authorship as a framework to evaluate pedagogies.

Background

Self-authorship is a promising framework for exploring the impacts of preparedness portfolios, and other innovative pedagogies, because higher education scholars consider student development toward self-authorship a main mission of higher education.[5-11] For example, growth along the student development dimensions—intellectual, identity, and relationships—is fundamental to what it means to be a modern citizen. According to Baxter Magolda, a prominent self-authorship scholar, the defining characteristics of a self-authoring individual are also important "learning outcomes of higher education"—

> Educators, legislators, and the American public concur that learning outcomes of higher education should include effective citizenship, critical thinking and complex problem solving, interdependent relations with diverse others, and mature decision making (p. 69).[10]

Educators have historically focused on students' intellectual development. While this focus on knowledge acquisition and meaning making is definitely important, there is merit in examining other domains of development as well (e.g., identity and relationship) in order to obtain a more comprehensive view of student development. For example, by attending to students' identity development, educators can examine the ways in which students understand community norms while grappling with and defining their personal ethics. Further, by including relationship development, educators can assist students in understanding and engaging in healthy and mature relationships. Self-authorship combines these three domains for a more holistic perspective of student development.

Self-authorship scholars characterize college student development as the growth from external definition to internal definition;[5,6] more specifically Kegan describes this transformation as a progression from the socialized mind to the self-authoring mind.[5] According to Kegan, at the socialized mind, individuals are "had" by their experiences, rather than owning and "having"

their experiences.[5] For example, when individuals are "had" by their experiences, they are limited in their ability to step outside of and reflect on those experiences. Kegan depicts the transition toward self-authorship as a growth in the ability to "have" experiences, rather than being "had" by experiences.[5]

According to self-authorship scholars,[5,6] development occurs along three dimensions: intellectual, identity, and relationships. These dimensions are defined as follows:

- Intellectual (beliefs): Exploring and then deciding what to believe and where one's ideas come from, which involves the question—how do I know?
- Identity (intrapersonal): Understanding one's place in the world, and deciding what type of person he or she wants to be, which involves the question—who am I?
- Relationships (interpersonal): Exploring the renegotiation of respectful relationships, which involves the question—what relationships do I want with others?

Along these three dimensions, there is potential for movement from a socialized mind (one defined by an external definition) to a self-authoring mind (one defined by an internal definition). This movement along the three dimensions is illustrated in Table 1.

Table 1. Progression of student development from external definition to internal definition.

Development Dimension	External Definition (Socialized mind)	Internal Definition (Self-authoring mind)
Intellectual (Beliefs)	View knowledge as certain, dependent on authority	View knowledge as contextual, self as knowledge constructor
Identity (Intrapersonal)	Define values and beliefs externally	Define values and beliefs internally
Relationships (Interpersonal)	Engage in dependent relationships	Engage in interdependent (mutual) relationships

In order to better understand the students' experiences developing preparedness portfolios in light of their journey from the socialized mind to the self-authoring mind, and in order to assess self-authorship as a framework for assessing pedagogical approaches, the following research questions emerged:

1. Does the creation of a preparedness portfolio in a studio context promote student development toward self-authorship?
2. What are the merits of self-authorship as a framework to analyze pedagogies such as the portfolio studio intervention?

Methods

In this section, we describe the portfolio activity and the associated studio intervention, and present our data collection and analysis approach.

Portfolio Studio. In the context of a one-credit portfolio studio, we engaged engineering undergraduates in creating an argument about their engineering preparedness. Over the course of an academic quarter in spring of 2010, students argued their engineering preparedness based on evidence drawn from all life experiences. These preparedness arguments were developed in the form of an online portfolio. The portfolios were developed in five, two-hour studio sessions, in

which students were involved in brainstorming, peer reviewing, and sharing. In this studio setting, students were given freedom to approach the activity in a variety of ways with a only a few guidelines about what their portfolios should contain: (1) a professional statement that presents an argument for one's engineering preparedness; (2) artifacts that support the preparedness claims made in the professional statement; and (3) annotations that link the artifacts to the claims made in the professional statement. These guidelines helped structure the portfolio activity; within this structure students had control over the content.

Data collection. At the end of portfolio development and after grades had been assigned (and with human subjects approval) all students were invited to participate in a research study about their experience developing a preparedness portfolio in the one-credit portfolio studio. Students were offered a small compensation for their participation. Three female students volunteered to be interviewed. One student (Emily) was a sophomore in Chemical Engineering; another student (Victoria) was a junior in Chemical Engineering; and the third student (Crystal) was a junior in Mechanical Engineering. Crystal was a returning student, who had completed a humanities degree as a traditional undergraduate student. She worked for a few years and then returned to school for an engineering degree. Both Emily and Victoria were traditional college-aged students (i.e., matriculated to college immediately after high school graduation).

With the goal of exploring if and in what ways the portfolio studio challenged and supported student development, the interviews consisted of questions about the students' overall experience constructing the portfolio and participating in the portfolio studio. These questions were developed with an eye toward targeting each developmental dimension and the concept of self-authorship more holistically. See the appendix for interview questions and targeted dimensions; these provide a structure for future researchers interested in using self-authorship as a lens to explore their data. Some of these questions emerged from the literature;[12] however, it should be noted that the current self-authorship literature includes very few validated instruments.

Data analysis. For this study, the post-interviews were the primary source of data. However, the post-surveys and portfolio content served as a backdrop for the analysis (i.e., validating findings from the post-interviews). In this paper, we provide themes through describing, comparing, and contrasting the experiences of three students as they developed a preparedness portfolio in a studio setting. Using a constructivist grounded theory[13] approach the first author explored the data at the participant level to understand the three students individually, and then compared their experiences to find emergent themes related to self-authorship.

More specifically, based on the self-authorship literature we identified markers (e.g., behaviors, emotions) of self-authorship as a way to operationalize what this construct could look like. Using this as a grounding piece, we (1) filtered the interview transcripts to identify units of conversation that reflect the students' preparation and/or engagement with being and/or becoming self-authored individuals; (2) sorted these meaningful units of conversations into themes; (3) wrote narratives for each participant based on the themes; and (4) conducted thematic analysis across the three participants.[14] In order to ensure rigor, the first author conducted the analysis while continuously engaging the other two authors in conversation about the data.

Findings

In this section, we focus on answering the first research question—does the creation of a portfolio in a studio context promote student development toward self-authorship? Our analysis revealed two main findings: (1) students constructed meaning of themselves through their past experiences and (2) students constructed meaning of themselves through others' perspectives. We then use these findings in the concluding remarks as the underpinning to answer the second research question— what are the merits of self-authorship as a framework to analyze pedagogical approaches?

For each of the following two findings—constructing meaning of self through past experiences and others' perspective—we provide an overview, illustrate how the finding connects to self-authorship, and elaborate on the finding through examples and quotes from the three participants.

Constructing meaning of the past

While building the portfolio, students constructed meaning of past experiences and their background. The process of examining past experiences in light of future goals prompted students to reflect on and understand these past experiences in new ways. This meaning making contributed to the students' confidence, awareness of growth, and re-acknowledgement of their passion for engineering.

Connecting to self-authorship. Confidence is a marker of self-authorship because when individuals begin to see themselves as capable there is potential to develop their internal voice. Through developing the portfolio, both Crystal and Emily became more confident in their engineering abilities. Further, awareness of personal development is an important aspect of being able to internally define values and beliefs, which is a marker of a self-authoring individual. For example, as a second year engineering student, Emily often gave herself little credit for growth. Through portfolio construction, she recognized her development and potential trajectories forward. Finally, passion is a marker of self-authorship because it can be associated with things or experiences that are internally important. While building the portfolio, Victoria recognized that the rigorous day-to-day activities of engineering education can often be de-moralizing. Through developing the portfolio, she rekindled her passion for engineering. The following examples from the three participants further illustrate these connections between building a portfolio in a studio setting and the students' development toward self-authorship.

Crystal: Gained confidence in her unique background. Through interactions with both peers and the facilitator, Crystal gained confidence in (1) her unique story and identity as an engineer and (2) her ability to tell her engineering story through the portfolio. She described this revelation as a result of interactions with peers—

> the response I got from my peers, who were like, wow, that's amazing that, you know, you have like all this life experience, you have experience like, you know, a completely different field, and it was interesting to me just like the support that I felt from peers and from Ken, too, about, you know, hey, you know, this -- all this life experience you have is really cool, and maybe if an employer wants someone who fits in this perfect box, maybe it's someone who you don't want to work for.

> So I guess kind of like -- it kind of like changed my scope as to…Just not feeling like, oh, I need to kind of like hide what I know already or like, you know, also just being able to really explain and show people, yes, maybe I have this really like weird or diverse background, but it all still relates to engineering in some way.

Emily: Validated her engineering potential. Through the portfolio activity, Emily recognized personal and professional growth. Because she had few engineering-specific experiences, the overall studio structure (e.g., small groups, peer review, freedom) contributed to her "confidence" for her future in engineering. She even articulated this confidence in terms of her "potential" to be an engineer. Additionally, the studio structure contributed to her "engineering thinking," and allowed a space for her to recognize the importance of a specific experience (i.e., tutoring). The overall structure of the portfolio studio—"less rigidity" and "more freedom"—"taught [her] to think like an engineer." While reflecting on her experience as a tutor, she recognized the personal significance of this experience and shared this meaning with others. Furthermore, she described realizing her passion for and expertise in the subject she was tutoring, which contributing to her sense of confidence—"being in this position and it just really powerful, and I've never felt that confidence before."

Victoria: Developed a re-awareness of her passion for engineering. Portfolio development helped Victoria to remember why she was pursing engineering; it revived her passion for the field. She participated in the portfolio during spring quarter of her junior year, which had a challenging workload. While in the midst of all the stress, the portfolio activity allowed her the opportunity to take a "breather" and reflect on all of her accomplishments. This reflection helped renew her passion for engineering—

> [it helped me] realize like what I was interested in, it brought me back to like what I came to do engineering for, like why I chose engineering, like I wanted to help people, like renewable energy. Instead of just maybe taking classes, there's so many other like aspects to engineering, you learn about, like, oh this is pretty cool, and then it's like, oh, I don't actually know which one I want to do, but then I was like, oh, yeah, I want to help people and work with renewable energy sources, and brought me back to like seeing what I was actually wanting to do before, since there's so many–chemical engineering was like so many different fields you can go into.

Constructing meaning from others

In the portfolio, students constructed meaning from their interactions with the portfolio studio facilitator and studio peers. Further, to demonstrate their engineering preparedness, students envisioned what their intended audience (e.g., industry and graduate schools) expected in a portfolio, which impacted their choice of experiences to reflect on. These students recognized and acknowledged the significance of others' opinions in validating their past experiences and background. Specifically, these three students reported struggling with identifying the "right stuff" to include in their portfolios, and the support of others in the portfolio played an important role in overcoming this challenge.

Connecting to self-authorship. Through exploring and grappling with undefined constraints and making decisions regarding portfolio content and structure, these three students began engaging with trusting their internal voice, which Baxter Magolda describes as the initial stage in self-authorship.[6] In order to understand what they wanted to include in the portfolio, these students went through a process of gaining confidence in themselves. In this process, other people (i..e., peers and facilitator) in the study environment played an important role by supporting and validating past experiences, and providing benchmarks of what other engineering students are doing. For example, one student (Crystal) went further than trusting her internal voice. She built an internal foundation and secured internal commitments through recognizing the importance of including her prior background (i.e., literature degree) in the portfolio. Before portfolio development, she struggled with her identity as an engineer because prior to portfolio development, engineering authority figures questioned her non-engineering degree. Through interactions in the portfolio construction, she recognized that this distinct background was an important part of her, and not to include it would be an attempt to fit into a specific "engineering box." In recognizing the importance of her unique background, she decided that if presenting a specific type of engineer was required for a certain job, then the job wasn't the right one for her. Crystal's experience can be seen as self-authorship development because she went through a process of trusting, building, and securing an internal identity, which Baxter Magolda describes as path toward self-authorship.

Emily: Uncomfortable sharing, validated by sharing portfolio, gained confidence in experiences. In the context of the portfolio activity, Emily recognized and acknowledged the importance of others' perspectives, both those in authority positions (such as parents and educators) and those in more peer positions (such as other students), and how others' views were significant to her personal beliefs and validation. While developing the portfolio, she wanted to know the "right stuff" that should be included in the portfolio. The freedom of the portfolio activity contributed to her ability to "think like an engineer" (see above theme – *constructing meaning of the past*), as well it also contributed to her feeling uncomfortable about choosing portfolio content, and she desired external formulas to define the "right stuff"—"I did feel a little uncomfortable making it, just as I said like a million times, just not knowing if I had enough stuff or if it's the right stuff to be putting in the engineering portfolio." Even though she felt uncomfortable with the flexible nature of the portfolio activity, the facilitators' encouragement helped ease this discomfort. She described interactions with the facilitator as positive, "he [facilitator] was really encouraging and definitely always made me feel comfortable with the stuff that I was doing." Additionally, sharing her portfolio with peers contributed to her sense of discomfort because she often compared herself to others and felt as though others would judge her engineering preparedness. She described this discomfort as feeling "awkward," "anxious," and "embarrassed," and being "self-conscious about my writing." In the end, sharing her portfolio content actually contributed to a sense of her validation of past experiences.

Crystal: Uncomfortable sharing, validated by sharing portfolio, gained confidence in distinct background. Crystal recognized and acknowledged others' perspectives and how these views are significant to her personal validation. She identified and accepted perspectives of others who were both in authority positions, such as parents and educators, and those in more peer roles, such as other students. Before developing the portfolio, previous authority figures (i.e., advisors and interviewers) questioned her background in both linguistics and engineering, which often

made her doubt her identity as an engineer. She described reflecting on an interaction with a potential employer, which caused her to consider whether or not to share her background—

> I just remember the interview that I had over the phone with the company, the person from the company was just really questioning my background, and at this point that made me feel like they thought that I was somehow like lying about all the stuff I had done. They were like, oh, well, I need to check your -- check like your, uh, references and make sure you really are who you say you are, so that kind of like -- made me feel like, oh, geez, maybe I shouldn't be presenting the fact that I have…They were like, you know, typically we see people who they do well at math and science in high school, then they go to college for engineering, then they just come to us for an internship, and we don't see people like you, so we need to figure out who you are, so kind of questioning like -- Yeah, like my identity as an engineer and whether or not I really could like cut the muster in engineering, so. . . I mean it kind of makes you feel kind of crummy, you know, it made me feel pretty like -- it kind of did make me question like am I an imposter, like am I -- am I just trying to like pose as an engineer, do I really have these skills, am I -- should I even be kind of, you know -- should I even pursue this, or am I just kind of like kidding myself about being able to do the math and science, because I -- I don't think I was necessarily like weak in those skills in high school or at any point in time, but it definitely wasn't always my strong suit.

These previous experiences sharing her background contributed to her feeling "very nervous" about sharing her portfolio in peer review; she thought "they're [peers] going to think I'm weird and they're going to be really questioning like, oh, why are you doing engineering." However, other students had a positive reaction to her portfolio and her unique background. Furthermore, other students encouraged her to be more aggressive in her claims, rather than passive. These interactions with peers and the portfolio facilitator were quite important to contributing to her confidence in her story as a unique engineering. And she recognized that if a potential employer questioned or did not value her background, maybe the company was not the correct fit for her. She recognized the powerful role these interactions were in validating her background—

> [The facilitator] in particular, I feel like he's -- he's really helpful and empowering students, and I feel like just hearing -- hearing from him as someone who's an educator, you know, if these people [future employers] want to put you into that box, maybe you don't want to work for them, like that just made me like lay down all these fears that I had, basically, so -- and it was just -- sometimes it just takes like one sentence from someone who you respect as an educator to really like change your mind-set on things.

Victoria: Confident sharing her portfolio, relied on others' opinions. Throughout portfolio development, Victoria relied on and valued the opinions of external authority figures (e.g., facilitator, industry audience). Initially, when starting the portfolio activity, she struggled with what content "should" be in an engineering portfolio. Throughout the course of portfolio development, the facilitator's suggestions were quite important to her decision-making of what experiences to include and ways to approach the presentations of those experiences. For example, in the context of the data collection interview, when evaluating whether or not she was pleased with the portfolio content, she discussed the facilitator's perspective—"Yeah, definitely.

Because I know our teacher was saying that it was very interesting reading my professional statement, it shows my personal side, and so that's good." Before starting the studio, she thought industry expected to see only engineering-related experiences (e.g., internships, research). Portfolio development, and particularly the encouragement of the facilitator, helped broaden her conception of what counts as engineering (e.g., co-curricular activities), and what she could use to demonstrate her engineering preparedness. Even though at the end of portfolio development, she recognized the importance of including co-curricular experiences and showing her personality in the portfolio, she was still unsure if her portfolio aligns with engineering industry's needs. For example, many of her statements about specific things she included in her portfolio (e.g., demonstrating her personality or reasons for pursing engineering) were followed by, and almost qualified by, statements such as, "I think employers really care about…"

Concluding Remarks

The findings of this research—students constructed meaning of themselves through their past experiences and through others' perspectives—are consistent with our previous research findings about preparedness portfolios developed in a studio setting.[15] In this paper, we examined these findings through the lens of self-authorship, which allowed us to bring to light two important ways in which the construction of a preparedness portfolio in a studio setting supported student development toward self-authorship.

This research was guided by two questions: does the creation of a portfolio in a studio context promote student development toward self-authorship; and what are the merits of self-authorship as a framework to analyze pedagogy? In answering the first research question, the results suggest evidence that the portfolio activity supports student development toward self-authorship. Specifically, the findings reveal that through the portfolio activity students engaged in self-authorship behavior—constructing meaning of self through past experiences and the perspectives of others. Through constructing meaning of their past experiences, these students self-reported gaining confidence in their engineering preparedness and remembering their passion for engineering. Because these findings are markers of self-authorship, we inferred student development toward self-authorship. For example, confidence is a marker of self-authorship because when individuals begin to see themselves as capable there is potential to develop an internal voice. Further, awareness of personal development is an important aspect of being able to internally define values and beliefs. Finally, passion is a marker of self-authorship because it can be associated with things or experiences that are internally important to someone.

These results are promising indicators of student development toward self-authorship; however, future research could guide exploration of alternative explanations of the findings. For example, gaining confidence and passion from constructing meaning of one's past could also indicate simply those things, rather than a movement toward self-authorship. While alternative explanations are plausible, returning to the methodology and methods associated with self-authorship could be a fruitful next step. Through our second research question—and what are the merits of self-authorship as a framework to analyze and evaluate various pedagogies—we begin the initial steps of this analysis.

Self-authorship is a promising framework through which to view and assess the educational significance of a given pedagogical approach. The holistic nature of self-authorship along the three developmental dimensions (i.e., intellectual, identity, and relationships) has the potential to capture the intricacies of complex data. The self-authorship literature has taken steps toward concretely defining the construct and associated dimensions; however, the literature base is still emerging. For example, there are few validated data collection instruments. In contrast to other educational theories, such as self-efficacy, self-authorship has been studied to a lesser degree. While we acknowledge the limitations of the self-authorship approach, we believe the approach offers a variety of merits for researchers and educators. First, self-authorship is a complex theory that includes a variety of dimensions (i.e., intellectual, identity, and relationship development). This broad theory provides a more holistic approach to exploring and researching student development, which aligned well with the preparedness portfolio data. In this research, we needed a theory that was broad enough to capture what was going on in the data without going outside of that theory. Finally, the ambiguous nature of the theory lends itself to flexibility in application.

In evaluating self-authorship as a potential framework for assessing pedagogy, this work was an important first step. First, this research built a foundation for such an endeavor through (1) exploring self-authorship applied to a specific context (i.e., preparedness portfolio and portfolio studios) and (2) evaluating both the strengths and weakness of such an approach. Future, work could explore deeply into these two areas through applying self-authorship as a lens to other pedagogies.

Bibliography

1. National Academy of Engineering of the National Academies. (2004). *The Engineer of 2020: Adapting Engineering Education to the New Century.* Washington, D.C.: The National Academies Press.

2. National Research Council. (2009). *Rising Above the Gathering Storm* Two Years Later: *Accelerating Progress Toward a Brighter Economic Future*. Washington, D.C.: The National Academies Press.

3. The Royal Academy of Engineering. (2006). *Educating Engineers for the 21st Century.* London: The Royal Academy of Engineering.

4. Turns, J., Sattler, B., Eliot, M., Kilgore, D., & Mobrand, K. (in press). Preparedness Portfolios and Portfolio Studios. *International Journal of ePortfolio.*

5. Kegan, R. (1994). *In Over Our Heads The Mental Demands of Modern Life*. Cambridge: Harvard University Press.

6. Baxter Magolda. (2001). Making Their Own Way: Narratives for transforming higher education to promote self-development. Sterling: Stylus Publishing, LLC.

7. Kegan, R. (2000). What "Form" Transform? A Constructive-Developmental Approach to Transformative Learning. In J. Mezirow (Ed.), *Learning as Transformation* (pp. 35-69). San Francisco: Jossey-Bass.

8. Baxter Magolda, M. B. (2000). Teaching to Promote Holistic Learning and Development. *New Directions for Teaching and Learning, 82*, 88-98.

9. Baxter Magolda, M. B. (2003). Identity and Learning: Student Affairs' Role in Transforming Higher Education. *Journal of College Student Development, 44*(1), 231-247.

10. Baxter Magolda, M. B. (2007). Self-Authorship: The Foundation for Twenty-First-Century Education. In P. Meszaros (Ed.), *Self-Authorship: Advancing Students' Intellectual Growth, New Directions for Teaching and Learning*. San Francisco: Jossey-Bass.

11. King, P. M., & Baxter Magolda, M. B. (2005). A Development Model of Intercultural Maturity. *Journal of College Student Development, 46*(6), 571-592.

12. Baxter Magolda, M. B., & King, P. M. (2007). Interview Strategies for Assessing Self-Authorship: Constructing Conversations to Assess Meaning Making. *Journal of College Student Development, 48*(5), 491-508.

13. Charmaz, K. (2006). Constructing Grounded Theory: A Practical Guide through Qualitative Analysis. London: SAGE Publications Ltd.

14. Miles, M. B., & Huberman, A. M. (1994). Qualitative Data Analysis: An Expanded Sourcebook (2nd ed.). Thousand Oaks: SAGE Publications Ltd.

15. Kilgore, D., Sattler, B., & Turns, J. (in press). From Fragmentation to Continuity: Engineering Students Making Sense of Experience Through Development of a Professional Portfolio. *Studies in Higher Education.*

Appendix

Table A-1. Interview questions with the associated self-authorship dimensions.

Interview	**Self-Authorship Dimension Targeted***
01. What are your chief take-aways from this experience?	all
02. Thinking back on your experience with portfolio development this quarter, what was the most surprising thing about it?	all
03. What was the most rewarding thing about it?	all
04. What was easy or enjoyable about creating your portfolio?	
05. What was the most challenging or unpleasant thing creating your portfolio?	all
06. Please describe the aspects of your portfolio you like the most.	all
07. Please describe the aspects of your portfolio that you like the least, besides the Catalyst or Google formatting limitations.	all
08. How would you change your portfolio if you worked on it more in the future?	all
Learning Environments	

09. What expectations did you have when joining the portfolio studio? Did you experience align with these expectations? Please explain.	all
10. In what ways was the portfolio experience different from the rest of your undergraduate coursework?	cognitive
11. In what ways was the portfolio experience similar from the rest of your undergraduate coursework?	cognitive
12. What is your view of an ideal classroom environment that is conducive to your needs? In this environment, what is the role of the educator? What is the role of the student? How do you feel when the educator evaluates you or your work?	cognitive, interpersonal
13. Did the portfolio studio align with this view? If yes, please explain how? If no, how could it better align?	cognitive
14. People have said that working on the portfolio influences how they view the courses they have taken or plan to take. Is this true for you?	cognitive
15. How useful was working on portfolio in regard to current coursework, future plans?	intrapersonal, cognitive
16. How does creating a portfolio compare to other things you have done?	cognitive
Interactions with others	
17. Describe your interactions with peers in the portfolio studio.	interpersonal
18. Describe your experiences with peer review - both receiving and giving feedback. What did you gain from these activities?	interpersonal
19. How do you deal with encounters with people who hold different views from yourself?	interpersonal
20. During the portfolio studio, did you encounter people who held views different from yourself? If yes, how did you handle the situation? If no, how would you hypothetically handle the situation?	interpersonal
21. Do you think you handle these types of situations (encountering people with different views) differently since participating in the portfolio studio?	interpersonal
22. Generally, do you think the portfolio activity has better prepared you to work in teams?	interpersonal
23. Do you think the portfolio has made you more open to others' ideas?	interpersonal
24. Often working in groups people offer up ideas that the group does not take up, has this happened to you? Please explain the situation, your attitude and feelings. Do you think this portfolio experience has influenced how you would respond to such situations in the future.	interpersonal
25. Describe a time you were advised to take a certain course of action, but didn't agree with this path and want to take another path. Do you think this portfolio experience has influenced how you would respond to such situations in the future.	interpersonal
26. Describe a situation when you felt like you were being pulled in different directions. Do you think this portfolio experience has influenced how you would respond to such situations in the future.	interpersonal
Decision-making	

27. Think about the various experiences that you revisited or reflected on during this term. Select one that stands out to you and tell me about it. What was the experience and what types of thoughts did you have while you were revisiting or reflecting on it?	intrapersonal, cognitive
28. Describe the decision-making process of choosing a specific artifact? How did you decide on the artifact? Why this artifact over other artifacts?	all
29. In retrospect, are you surprised by any of the artifacts you included in the portfolio? Tell me a little more about that.	cognitive, intrapersonal
30. In a situation where information is not clear cut, how do you go about making a decision? OR How do you make decisions in the face of conflicting information?	all
31. What was the most important decision you made while developing your portfolio? What was the decision? What were your options? Are you pleased with the decision?	cognitive, intrapersonal
Dilemma	
32. Please describe a dilemma you have faced in life. Describe how you experienced the dilemma, who was involved, how you handle it. If you were to face the same dilemma now (after the portfolio experience) that you would respond different?	intrapersonal, interpersonal
Thinking Process	
33. Did this professional portfolio activity get you to think? If yes, please explain in what ways. If no, explain why not.	cognitive
34. Has this experience led you to think differently about or approach other learning experiences at the university in new ways? Explain.	cognitive
35. People have said that working on the portfolio makes them think differently. Is this true for you?	cognitive
36. Do you believe that your experience creating a portfolio has resulted in a change in your values, beliefs, opinions, or expectations? Please explain.	cognitive
37. Tell me a story about one of the most significant learning experiences you had while here at the UW. What was it about this experience that made you identify it as one of your most significant learning experiences? What did you learn? Why do you think you learned so much? How do you think you will use what you learned in the future? Who was involved in the experience, and what were their roles?	
38. What do you see as the relationship between knowledge and truth?	cognitive
Future & Preparedness	
39. Do you intend to complete a major in engineering?	cognitive
40. If someone were to read your portfolio, would they think you were ready to work in industry or to attend graduate school?	cognitive, interpersonal
41. In your opinion, would the artifacts and annotations in your portfolio convince others of your readiness for industry or graduate school?	cognitive, interpersonal

42. In your opinion, would your professional statement convince others of your readiness for industry or graduate school?	all
43. Some students report learning about themselves and even being impressed by their accomplishments (gaining confidence), did this happen to you? Please explain.	all
44. Sometimes we've heard that creating the portfolio creates tensions between what one wants to do and what one should do. While creating the portfolio did you experience any tensions like this one? Please explain.	interpersonal
Comfort level	
45. Students have described having different comfort levels with the portfolio process and studio, could you talk about your comfort level? What made you comfortable? What made you uncomfortable? How did you get over the discomfort?	all
46. Have you experienced other situations where the comfort level was similar to the portfolio? If yes, could you explain the situation, what you did, what was different, the same?	all
Closing	
47. Did the portfolio contribute to your sense of empowerment? Please explain.	intrapersonal
48. Is there anything else that you think is important for me to know to understand how you experienced the portfolio studio?	all

* In addition to the development dimensions targeted, the question may illicit answers from other dimensions.