

WIP: Using ePortfolios to Enable Life Project Mentoring Among First-Year Engineering Students

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Abstract

This is a work in progress. ePortfolios are portfolios in electronic form. These are known to promote folio thinking, a reflective technique that allows students to describe their learning experiences through a purposeful gathering of objects. This systematic gathering of proof of learning and professional development could also empower students as they build a digital presence whilst thinking about their life projects. The concept of a life project—a long-term plan that propels one toward their goals—integrates many areas of one's life, including upbringing, values, and extracurricular activities, among other personal dimensions. Reflecting on these aspects of life can be critical to developing a sense of belonging and mattering in college for first-year students. In addition, the transition to residential college life can be overwhelming and decisive on their pathway to completion of their degree. This is especially true for students from first-generation or limited-income (FLI) families, however most first-year students struggle to envision their future selves. To improve students' sense of belonging, our engineering school has implemented ePortfolios in conjunction with a new mentoring and advising system to scaffold the undergraduate experience. This work in progress showcases a qualitative study to examine the potential for ePortfolios to be used in the context of the student's lived experience and for the creation of life projects. We engaged with undergraduates in open-ended interviews, and transcribed data is being analyzed using Grounded Theory. Preliminary findings provide light on how students use ePortfolios, perceived problems, and the key benefits they find in the tool.

Keywords: eportfolio; e-portfolio; life project; undergraduate engineering education; mentoring

Introduction and Theoretical Framework

Portfolios have traditionally been used to display projects, methods, and products in the fields of design, architecture, and the arts. They are also commonly used to display teaching evidence, research milestones, and other areas of academic and professional life. Portfolios foster “folio thinking” which is “... a reflective practice... defined as a purposeful collection of artifacts that characterize the learning experiences of the portfolio owner” [1]. EPortfolios are portfolios in electronic form. They are a “digitized collection of artifacts including demonstrations, resources,

and accomplishments that represent an individual group or institution” [2]. They are a systematic gathering of proof of learning and professional development. They could empower students, instructors, and staff to develop a digital presence. They hold the potential to aid evidence gathering for accreditation, internal promotion, and provide a mechanism to connect with industrial and other external partners. As an undergraduate academic tool, ePortfolios can be used for integrating and reflecting on the student’s learning career, in line with Yancey’s multiple curricula of higher education which involves learning beyond the classroom. This framework integrates the experienced curriculum, a delivered curriculum, and the lived curriculum [3]. Despite the range of current uses, there is an opportunity to better harness their potential for supporting and mentor undergraduate students in their professional growth [4].

Much of the literature embraces the use of ePortfolios as a catalyst for student learning [5]. However, only a small portion of the literature considers a use beyond institutional learning spaces. Those that do refer to ePortfolios as an online personal environment for lifelong and life-wide learning [6], a bridge between the life project and university, or a metacognitive activity to develop personal and professional life plans [7]. The paradigm of Life Construction [8] used in developmental psychology, and the new concept of Life Design [9] relate to new ways of thinking about career development. These conceptualizations offer the opportunity to examine the use of ePortfolios in the building of a student’s Life Project. A life project is a framework that demonstrates one’s plans for the future, key orientations, critical areas of focus, and the decisions required to achieve one’s vision [10]. In addition to professional goals, life projects integrate many areas of one’s identity, including upbringing, values, and extracurricular activities, among other personal dimensions. With their orientation toward folio thinking and potential for housing personal aspects of oneself, ePortfolios might be a key tool for integrating personal and professional aspects of one’s identity in the creation of a life project [11]. We aim to utilize ePortfolios as a vehicle to support students to curate their own experiences, as a way to reflect on their own identity and personal goals. What if the ePortfolio becomes a window into a student’s life project?

ePortfolios have also been described as “a living portal” for the students to express themselves in relationship to others [12]. Therefore, we see an opportunity for them to facilitate deeper mentoring relationships. Faculty and other mentors can have a “window” into broader evidence from the student’s learning pathway--something beyond grades and transcripts. Regarding the use of ePortfolios for advising and mentoring, the literature states that many students have outstanding experiences that may be useful in building connections with mentors. However, these encounters are never discussed [5]. As Nguyen found in her research (2013), ePortfolios serve as a sharable narrative of identity; a new understanding of self, and they can create a space in the present to both refigure the past and imagine one’s future [12]. Thus, the living gateway helps to share identity with others and is reinvented in narrative, text, and conversation [12]

possibly enabling a more wholesome connection to mentors. This, in turn, might support the development of a sense of belonging – a key outcome of successful mentoring [13] - while also providing mentors with a basis for giving personalized advice on many important matters [5]. The current study looks to explore the following research questions: How are first-year students perceiving and experiencing the use of ePortfolios? How have others, faculty, life designers, or academic advisors been interacting with the students' ePortfolios? We believe this exploratory study's findings can help by providing information on the actual and possible applications of this tool in the transition of first-year college engineering undergraduates.

Methods

Research Context

The **Johns Hopkins Whiting School of Engineering** is our main unit of analysis. In recent years, multiple changes have occurred in this R1 Institution. There has been a major revision of the undergraduate curriculum which looks to have a more personalized approach to learning and research for undergraduate students [14]. Part of these changes forced us to assess our current faculty advising system for undergraduates, identifying major gaps to address. In addition, due to policies that prioritize diversity, there has been a 94% increase in our first-generation undergraduate population in all our schools from 2017 to 2023 [15]. These are some of the reasons that motivated a decoupling of mentoring and advising where faculty become adult role models focused on undergraduate academic socialization, professional identity, and instilling a sense of belonging in the students. On the other hands, the professional academic advisors' main role is related to degree completion and administrative tasks that need to be fulfilled by the students on time. In this context of personalized learning, paired with first-year students who may be juggling the challenges of new residential college life away from home, as well as the difficulties of a curriculum that allows for the freedom of the journey, the ePortfolio comes in as a piece where students can reflect, but also communicate to others about what matters to them professionally and personally.

Participants

In August 2023, 520 undergraduate first-year engineering students at the Whiting School of Engineering, representing all engineering majors, began using an ePortfolio platform purchased by the institution. We sent an IRB-approved email invitation to these students to participate in this research. In addition, older students were invited to participate as part of a pilot program where they were given access to the ePortfolio platform. All engineering students were invited to an intersession short course in January 2024 by the previously named Career Services unit, rebranded as the Life Design Lab. These students were also invited to participate in our research.

A few months into our research, we have recruited undergraduates from various departments, genders, and undergraduate years. We have been able to recruit from only five of our nine engineering departments. It is important to note that the sizes of the departments vary greatly, with one department having a cohort of approximately 125 students and another having only 5 first-year students. The initial interview sample is summarized in Table 1. Due to previous reviews to this work in progress, it is critical for the context of this scientific audience to explain that this qualitative research is conducted under a **naturalistic paradigm** and does not seek to infer causality from a sample universe. We are looking to aggregate qualitative (verbal) raw data that, as mentioned in the next section, is being analyzed using Grounded Theory [16].

Total Participants to date	9
Departments	5
Cisgender male students	4
Cisgender female students	5

Table 1. Initial interview sample.

Data Collection and Analysis

The design of this qualitative study looks to witness processes as they happen naturally and not to do any experimental or quasi-experimental work. We are carrying out individual open-ended interviews [17] [18] [19] with students ranging from 30 minutes to 1 hour. Interviews are recorded on Zoom, or a mobile device, and transcribed using Parrot.Ai. Following our IRB protocol, data has been anonymized. We also keep a lab notebook to document each instance.

The main question that we are trying to uncover is: **How do students perceive and experience the use of ePortfolios?** Transcription of preliminary data is being analyzed using Grounded Theory [16] looking for salient themes [20] related to our theoretical framework and questions. To work with internal validity [21], we will have to negotiate the preliminary themes amongst the study team members [22]. However, we are not yet finished with the data coding or the entire data collection.

Preliminary Results

During the open-ended interviews, the students discussed the balance of quantity and quality in the entries and materials added to their ePortfolios. Openly, the students talk about the creative affordances [23] [24] of the ePortfolio platform, as opposed to the LMS (Learning Management System). They indicate that they had many possibilities, given by the platform, for curating their materials. The opportunity to express themselves are given by the organization of sections, selection of photographs, and the writing to reflect their own tone and “true persona”.

- *"What did I really derive from these experiences, and it forced me to really think about what I did and why ... it is completely personalized as opposed to just putting it into like a description box".*
- *"Talking about your perspective of things and making it about you and your thoughts is what makes it stand out."*

In relation to the concept of "living portal" [12], some of the students do perceive the ePortfolio as a window into other people's or students' lives.

- *"You go to show your professor, who could read it and see more about you and learn more about you. Also, you could read the professors and other people to learn more about them."*
- *"When someone asks you who you are, it is hard to think of what to tell them. And I think this really helped."*

There are also themes of "flux" and change in personality, background and goals that need to be adapted as students change and grow, overall, in their transition from high school students to first year engineering undergraduates:

- *"I basically talked about my past my educational background, my passions, my hobbies and I felt like that was enough, but I feel like they are subject to change in the near future."*

Lastly, students also talked about timing and barriers to start and commit to updating their ePortfolio. Some of them indicated that there were just "not enough things" to talk about at this point, or that it was hard to get started if they had not seen it in a course.

Preliminary Conclusions

This work in progress expands on actual and the potential uses of an ePortfolio for undergraduate engineering students. Because the roll out of the ePortfolios has been in an incremental pilot structure, it has not been easy to recruit students to participate. We believe they will be more interested once the use of the tool is incorporated as a policy at the University level. Thus, future work will require the recruitment of additional people to attain theoretical saturation. Additional questions about the concept of a "portal", from a mentor's point of view, will be addressed in a second research project once we launch the mentorship initiative in August 2024. Future work wants to provide insight into how academics, life designers, and academic advisors have interacted with students' ePortfolios.

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