

Meaning and Impact: A Review of Personal Leadership Portfolios

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Abstract

In this paper we report our findings from examining 28 personal leadership portfolios, written by senior engineering students at the conclusion of a five-semester certificate program, to determine which activities or experiences were most meaningful to the students' development and what themes emerge in student descriptions of the program's impact. This paper adds to the community's body of knowledge on the types of leadership development experiences deemed most impactful to students, as well as on the use of portfolios as an assessment method.

In spring 2018, each student in the Zachry Leadership Program in Texas A&M's college of engineering created a personal leadership portfolio describing which experiences or activities in the program were most meaningful to them and how the program impacted their leadership development. In this study, we review the portfolio text using Hay's iterative coding process [1] to identify and quantify common themes. This process provides insight into which elements of our program are most impactful and why this is so, and suggests that analyzing portfolios can help us better understand how the program is impacting student leadership development by surfacing common experiences and perspectives.

Introduction

The Zachry Leadership Program is a relatively new leadership development effort for undergraduate engineering students at Texas A&M University. Students who are accepted take a series of five courses in leadership and earn a certificate after the successful completion of all five courses. The program began in January 2016 and the first cohort completed the requirements for the certificate in May 2018.

While we had collected feedback periodically throughout the five semesters, we were interested in understanding the graduating seniors' perceptions of the overall impact of the program. We were also interested in learning which activities or experiences they found most meaningful. Our goals in this analysis were to inform our own curriculum for future cohorts in our program and to share lessons learned with faculty and staff involved in leadership development programs for engineering students at other universities.

Program Background

The Zachry Leadership Program is a joint effort between the Texas A&M University College of Engineering and Zachry Group. The purpose of this program is to empower engineering students to become future leaders who are well versed in our free enterprise system, collaborative in their decision-making, and humbly self-confident in their behaviors.

The five-semester leadership program, commencing spring of sophomore year, is designed to provide a cohort of students with a broader perspective of the world in which they will live and work. Personal growth and self-improvement, rooted in reflection and dialogue, are the foundation of the program. Engagement with industry professionals and development of self-awareness helps them discover a sense for how they will fit into this world, a deeper insight into their individual potential, and a specific view of how they want to begin their professional careers. Students earn a certificate in Holistic Leadership upon completion of the program.

Students in the Zachry Leadership Program take a three-credit hour leadership course each semester. The course in each semester includes a mandatory pre-semester retreat that is an intensive, multi-day event consisting of experiential learning, interactive exercises and dialogue. During the semester, weekly class sessions include dialogue with peers, business simulations, personal reflections, case study discussions, and conversations with thought leaders from industry, government, and nonprofit organizations.

The student selection process includes an application, reference check and interview. The students must be in good academic standing, but their grade point average is not a consideration in the selection process. Rather, we select students based on commitment to personal growth, authenticity, and passion for making a difference. In 2018, 297 students applied for the 32 spots in the cohort.

The program is endowed and supported by Zachry Group, a privately held firm that specializes in turnkey construction, engineering, maintenance, turnaround, and fabrication services in the power, energy, chemicals, manufacturing, and industrial sectors. Zachry Group provides mentors who meet with students throughout the program and guest speakers each semester.

As students reflect on personal leadership qualities and practice functioning effectively in a team environment, they also explore the intersection of engineering and business. They learn more about the free enterprise system, market needs, stakeholders, and community needs. Each semester emphasizes a leadership theme including self-awareness, empathy, creativity, vocation, and lifelong learning.

Literature Review

We reviewed literature from multiple disciplines to learn about why developing leadership in engineering undergraduates is important, in what ways personal reflection helps with that development, and how portfolios can support that personal reflection. This brief review of that literature is not exhaustive and most likely omits some valuable contributions to the community's body of knowledge, but it summarizes some prevailing themes and provides a foundation for our assessment.

A number of studies point to the importance of developing leadership skills in engineering undergraduate students. For example, the National Academy of Engineering's *The Engineer of*

2020 report, written in 2004, notes that the engineers of the present age need, among other qualities, to be able “to understand the principles of leadership and be able to practice them” [2]. Others including Jablolkow note that it is important for engineers to develop nontechnical skills such as problem-solving, communication, collaboration, and the conviction to do the right thing and note that studying the humanities is an effective way for them to do so [3].

We also researched how experiential learning and reflection help students draw meaning. Peter Northouse’s extensive work around leadership development includes the Leadership Behavior Questionnaire and other tools that enable reflection and self-assessment of behavior [4]. Gathering formal and informal student feedback is another means of assessing student growth, according to Connaughton, Lawrence, and Reuben [5]. Bolden established reflection as “a representation of human consciousness. It refers to the process or faculty by which the mind has knowledge of itself and its workings” [6]. This kind of reflection can be particularly helpful in learning from challenging assignments or situations, according to Heslen and Keating. They note that when students are in learning mode, they are “intentionally framing and pursuing each element of the experiential learning process with more of a growth than a fixed mindset” [7]. Experiential learning is particularly helpful for developing leadership competencies including interpersonal effectiveness, strategic thinking, personal awareness, perspective taking, motivation, and self-regulation, according to Hezlett [8]. It allows for ongoing learning that accelerates as knowledge and experience build [9].

The assignment we gave our students involved the creation of an electronic portfolio (ePortfolio) that contained their reflections on the program and experiences. Williams notes that ePortfolios “allow students to collect and display diverse artifacts including photos, videos, music and more, and that they allow instructors to assess students more authentically” [10]. ePortfolios are also “easily accessible, sharable, and portable, and they are more environmentally friendly,” according to Jarrott and Gambrel [11]. In addition to collecting work, reflecting on it, and taking meaning from it, ePortfolios allow students to learn about webpage design and creation [12]. ePortfolios are also particularly helpful for people in transition [13], as our students in their final semester are, and in “enhancing engineering students’ graduate attributes [including] communication, critical thinking, problem solving, and teamwork” [14]. We were also encouraged by the findings about the long-term value of portfolios. Richardson and Wood found that they are “significant... in relation to lifelong learning records and personal development planning processes” [15].

Written portfolios have been found to encourage “purposeful collection of academic work over time,” and reflection on work [16]. Portfolios are also a good means of integration, allowing students to draw connections between assignments or experiences they may have previously seen as disjointed [17]. Corley and Zubizarreta introduce the term “portfolio thinking” to describe the benefits students get from thinking deeply, beyond knowing content information, accumulating credits, and earning grades [18]. In his book, The Learning Portfolio: Reflective Practice for Improving Student Learning, Zubizarreta writes that the portfolio “becomes a process of reflection, of organizing, prioritizing, analyzing, and communicating one’s work and its value”

that prompts personal insights that may not otherwise be realized [19]. Research also shows that students recognize the value of reflecting on experiences and creating portfolios [20].

Based on the extant literature, we expect our analysis of the leadership portfolios, in which students reflect on and describe their experiences in the program, will help us understand what was most meaningful to them and what impact the program had on their development as leaders.

Methodology

The focus of the last semester of the program is lifelong learning, and students create personal leadership portfolios to document their development over the course of the program. In the process, students explore who they are, what they value, and how they will use what they learned over the course of the program to shape their careers, personal lives, and contributions to their communities. Students review past reflections they have written, but they write the complete portfolio text during the last semester; it draws on those reflections but is a meta-reflection on the overall program created in a living document. It also allows them to reflect on who they want to be as they move into their next stage of life. The portfolio serves as a capstone assignment during this final semester.¹

Students utilize the free Wix platform to document these experiences and reflections in personal websites they create. We require them to include three broad sections, as outlined below, but they also have the option to include other sections if they choose.

1. About me—an exploration of their strengths, weaknesses, preferences, stories, values, and personalities
2. The impact of the Zachry Leadership Program
3. Aspirations for the future.

Within these categories, students have the freedom to draw on their experiences in the program and write about the impact in whatever manner they chose. Responses in this group of portfolios ranged from only 150 words to more than 1100 words.

Our primary goal with the assignment is to create an opportunity for the students to reflect on, synthesize, and take meaning from their work in the Zachry Leadership Program and other curricular and extracurricular activities in their undergraduate studies. We also realized we could analyze their writing to answer questions we were interested in exploring, including:

1. How would students describe the impact the program had on them?
2. Which specific activities or experiences were most meaningful?
3. What linkages could we see between the activities or experiences and the overall impact of the program?

¹ We did not deem it necessary to obtain the students' explicit permission to analyze their portfolio assignments since our study focused on observations from the collective set rather than on any individual submission.

The cohort who completed the leadership portfolio assignment comprised 28 students, of which 15 were male and 13 were female; three were Hispanic, three were African-American, five were Asian, and 17 were Caucasian. All 28 students completed the portfolio assignment, but one student subsequently deactivated the URL for her portfolio so we could not include it in this study; this analysis examines the other 27 portfolios.

To identify and analyze the impact themes, we reviewed the narratives from their portfolios using Hay's iterative coding process [1] to identify and quantify common impact themes, as described below. In researching different methods to analyze unstructured narrative-style data, we discovered that Hay's method is very similar to a process that one of us used in industry to analyze similar datasets. This familiarity with process led us to adopt it in this study.

We started by copying narratives about the Zachry Leadership Program from the student portfolios into one document. We did not include text from the other sections of the portfolios in this analysis. Four researchers then read all of the narratives and created independent lists of possible impact themes that we observed in the text. When we each had a list, we discussed the lists and created one joint list of themes. Again, three of the researchers (the fourth was unavailable to continue the study) then reread the narratives, refining the list of themes through multiple reviews until the process converged to a comprehensive list. With the final list, we reread the portfolio narratives, coding specific content by theme.

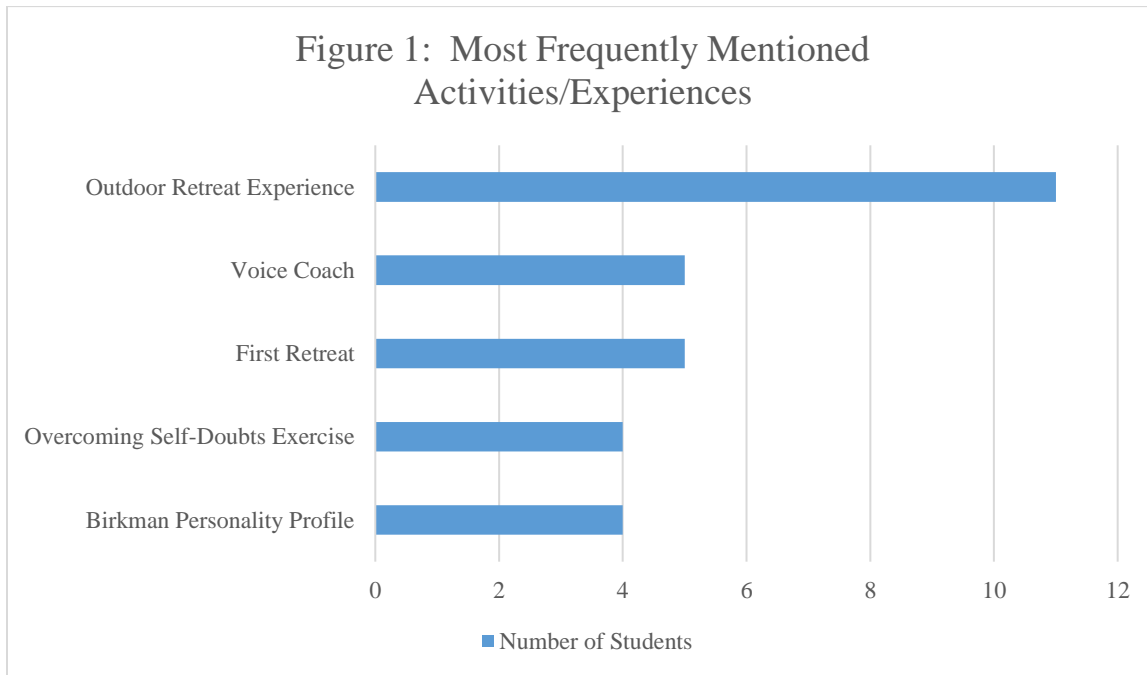
The three researchers read and coded individually, and we met as a group to discuss our findings and create our categorized set of narrative quotes, grouped by impact theme. Based on the quotes in each impact theme group, we then created titles and illustrative sentences for each group, including Reflection (*"I learned to reflect and became more self-aware"*), Confidence (*"I pushed the bounds of my comfort zone and became more confident"*), Authenticity (*"I became more comfortable being authentic and sharing my true self"*), and others. Note that these illustrative sentences are not direct quotes from the students. Rather, we wrote each one in a student's voice to summarize a group of student quotes, which we call an impact theme. We quantified the number of quotes by impact theme so we could analyze the overall landscape and the prominence of each impact theme.

Identifying, quantifying, and analyzing the most meaningful activities or experiences was easier because students identified them directly. To compile the list, one researcher read all of the portfolio narratives, noting which activities or experiences each student described and totaling the number of times each activity was mentioned.

Findings

Our review of the portfolio narratives revealed 27 different activities or experiences described by students as being among the most meaningful parts of the program. Some were entire retreats, while others were brief, organic experiences that we did not even plan. Of the 27 total activities or experiences, only five were described by four or more students as being among the most

meaningful for him/her. Figure 1 (below) lists the most prevalent activities or experiences and the number of students who mentioned them.



Appendix A describes each of these activities/experiences.

We found 13 activities or experiences that only one student described as being among the most impactful. There were nine other activities or experiences only described by two or three students as being among the most impactful.

Our analysis also surfaced six different impact themes related to the overall five-semester program. Table 1 lists the six themes in order by how often students described them.

Table 1: Impact Themes

Title	Illustrative Sentence	# of Students Who Described
Confidence	<i>I pushed the bounds of my comfort zone and gained confidence.</i>	19
Reflection	<i>I learned to reflect and became more self-aware.</i>	17
Perspective	<i>I gained new perspectives.</i>	15
Authenticity	<i>I became more comfortable being authentic and sharing my true self.</i>	11
Friendship	<i>I made meaningful relationships.</i>	10
Community	<i>I felt encouraged and supported by others in a way that helped me grow.</i>	8

Appendix B includes specific quotes from portfolios that we categorized in each impact theme.

Discussion

Most Meaningful Activities/Experiences

Several things stand out to us in the data. First, we were surprised by the number of different activities or experiences that the students listed as being most meaningful to them, and that no activity or experience was listed by more than 11 students. This suggests it is unlikely that we can plan any one activity that will be meaningful to an entire cohort of students, and that including a diverse group of activities will make it more likely that every student will find significant personal meaning in at least one of them.

The four experiences cited most often—the outdoor retreat, voice coach, the first retreat, and the overcoming self-doubts exercise—are the experiences we conduct that invite the most vulnerability and are likely seen by the students as the most challenging in the program (based on informal anecdotal evidence such as unrecorded student comments during office hours visits). Each one provides an opportunity to confront a common area of discomfort. For example, during the outdoor retreat, students sleep in tents and spend three full days completely outdoors, without electricity or cell phone service. One student described it this way: “We were away from almost all digital technology and immersed ourselves in nature while also working together to set up camp and cook. This was especially significant for me...” Another wrote:

“When we were given the details about this trip, I was terrified. It was something completely out of my comfort zone as I'd never been camping, had rarely ever been more than an hour away from family, and on top of that, I couldn't swim. I've always dealt with a fear of things that I can't control, and this trip was definitely something I couldn't control. I had even planned on missing the retreat, but at the last minute, I decided to go for it. It is one of the best decisions I've made. I ended up having an absolute blast and learned quite a bit about myself. I found out that I was more capable of stepping out of my comfort zone than I thought possible and that I had the ability to conquer my fears. I learned that the most effective way for me to overcome adversity is to have fun with whatever it is I am doing. A moment I'll never forget came on the second day of the retreat; I was in the middle of the river, legs dangling in the water, air guitaring [sic] with no fear in the world.”

The voice coach invites emotional discomfort, as students have the opportunity to stand in front of the cohort and be coached to sing a solo about an area in their life where they desire to grow or that they desire to share with others. One student described this experience this way:

“I think the whole singing component of the program was crucial for us to acquire the type of comfort level with each other and ourselves that we needed for other activities to be impactful. Some of the activities we did throughout the program were not designed to be comfortable, so everyone needed to be comfortable enough with each other to take those activities seriously and learn from them. Beyond that, it is important as a leader to

be able to move through uncomfortable situations, conversations, and interactions without hesitation...”

The first retreat is heavily focused on community building based on voluntary sharing of life stories and other personal experiences and observations of self. One student wrote: “This retreat gave me one of the many life-changing moments that ZLP would offer - I started to want to understand myself. I wanted to know why I was uncomfortable, what was holding me back from sharing, and most importantly, how I could change for the better.”

The overcoming self-doubts exercise invites students to notice and share with others a goal or dream and what self-doubts they hold that may impede their attainment of it. One student observed: “Although my topic was odd, the whole purpose of the activity blew me away. I found the value of acknowledging my doubts and confronting my fears with truth.”

The fifth experience cited—the Birkman Personality Profile—does not invite the same vulnerability or challenge, but does provide a structured report that students say helps them better understand themselves, how they interact with others, how they may be perceived, and what types of work may be enjoyable for them. One wrote, “Taking the Birkman Personality Test... furthered my understanding of my working personality.”

It is also interesting to note that some activities the students listed happened organically during “free time” at retreats or classes—we did not plan them. One such experience was a jigsaw puzzle that the group worked on during free time at one of the retreats. A student wrote that he felt like it helped him form friendships with others, and that he enjoyed the challenge of the puzzle. Another student wrote about an impromptu conversation he had with one of the Zachry executives. Their writing about these unplanned activities suggests it is important to include space for meaningful experiences to happen by not overscheduling retreats and classes.

Impact Themes

In general, these six impact themes—further described with student quotes in Appendix B—were all related to our original goals for students in the program. However, there were several content areas that we expected to surface that we did not observe prevalently enough to include as separate themes. For example, we emphasize creativity in the third semester of the program, so we expected to see students describe an impact related to helping them discover or rekindle their creativity. The absence of a theme related to creativity suggests that we reexamine our curriculum and assignments to try to make them more meaningful for students. A second theme that we expected to see relates to an increased understanding of the free enterprise system and how businesses operate, because we touch on that topic in three of the five semesters. The absence of this theme may, however, be related to our analytical method. We note that 10 students mentioned business lessons, but they did so generally and without describing any personal impact, so we did not include it as an impact theme.

We also expected themes about relationships and community to be more prominent because students often talk about these topics when describing the program. In our program, however, community and relationships are a means to help them reflect and share authentically. If students did not feel like they had developed strong relationships and a sense of community, the theme about authenticity probably would not have been as prevalent as it was. Therefore, we do not conclude that students are not forming this type of growth-oriented relationships even though they are the two least-often described themes.

Conclusion and Next Steps

These findings are significant for us as we assess our program and plan for future cohorts. We hope that these findings may also be helpful to other programs as they plan their curriculums and assess student outcomes. As this was the first cohort to complete the program, we were encouraged to find that the students reported that the program had these types of impact on their leadership development. Grounded self-confidence, personal reflection, openness to new perspectives, authenticity, and ability to build meaningful relationships are important qualities and skills for leaders to possess, so overall we deem the program a success. We also note opportunities to improve, especially in making the business and creativity modules more meaningful.

Our data does not allow for an analysis of the utility of the portfolio assignment itself in the development of the students, but that is something we would like to explore in future research. They were a constructive platform for us to learn more about which aspects of our program were most meaningful to students and how they described the overall impact of the program. In the future, we will consider combining ePortfolios with a traditional survey to gain greater clarity around impact and meaning. We will also consider reframing the ePortfolio assignment to require students to describe the impact of each activity or experience they mention as being meaningful to them to allow us to draw more conclusions about the impact of specific activities.

Appendix A

Activity/Experience	Description
Outdoor Retreat Experience	Five-day camping and canoeing retreat along the Buffalo River in Arkansas, taken before the start of the senior year. The Department of Recreational Sports helped plan the trip, collect needed supplies, and provide safety equipment and protocol. Along the journey, students reflected on transitions in life and their upcoming transition.
Voice Coach	A voice coach/corporate trainer helped the students “find their voice.” He invited the students to be vulnerable in front of the group as he led them through an exercise designed to help them share something with their peers.
First Retreat	At the students’ initial retreat, they began to establish a sense of community and to learn about personal leadership through reflection and dialogue.
Overcoming Self-Doubts Exercise	During the fifth and final retreat, a facilitator invites the students to identify a personal dream and enunciate any self-doubts that exist for them around their dream. He then leads them through a process that allows them to face and potentially debunk their doubts.
Birkman Personality Profile	Students completed the Birkman Personality Survey and met with Birkman-certified coaches in groups. This experience helped them understand some of their own unique personality characteristics and explore potential differences or challenges they may encounter when working with others.

Appendix B

Impact Theme	Student Quotes That Demonstrate the Theme
Confidence	<i>“overall confidence it has given me in myself, my abilities, and my understanding of where I fit in and work best.”</i>
	<i>“I was able to conquer challenges from high ropes courses to singing in front of my peers. After succeeding in those, I felt that much closer to discovering my ‘true north.’”</i>
	<i>“The Zachry Leadership Program has helped me improve my confidence as an engineer, an employee, and a leader.”</i>
Reflection	<i>“Learning how to reflect on myself was vital to my development.”</i>
	<i>“Knowing the outside world is fantastic, but knowing the world inside me is even more terrific.”</i>
	<i>“This retreat gave me one of the many life-changing moments that [the program] would offer—I started to want to understand myself.”</i>
Perspective	<i>“This program has given me so much more than a learning experience; it has given me a new perspective.”</i>
	<i>“This class gave me an understanding of engineering as a deeply human profession that must take the vibrant world around it into account...”</i>
	<i>“Getting all kinds of perspectives has been more meaningful than simply forming my own.”</i>
Authenticity	<i>“I came out of my shell.”</i>
	<i>“I wanted to bring forth my authentic self because I believed that I could contribute my strengths to lead and help others while also accepting the help of others to aid my vulnerabilities.”</i>
	<i>“It was difficult, I cried, but I verbally said out loud my dreams, hopes, and fears in one concise sentence. No beating around the bush, no fluffing it up, just the raw idea of what I want to do.”</i>
Friendship	<i>“I truly met some of my best friends.”</i>
	<i>“Creating lifelong friendships through mentoring...”</i>
	<i>“I met my best friend... it jump-started my favorite friendship I made in college.”</i>
Community	<i>“When I think of leadership, I think of people pushing others to get out of their own comfort zone.”</i>
	<i>“Through their questions, I discovered that many of my concerns were just self-doubt.”</i>
	<i>“The [program] firmly demonstrates that we accomplish more and are willing to go further because we are part of a group.”</i>

References

- [1] Hay, Iain. Qualitative Research Methods in Human Geography. Oxford University Press. 2005.
- [2] National Academy of Engineering, *The Engineer of 2020*, 1st ed. Washington, D.C.: National Academies Press, 2004. [E-book]. Available: National Academy of Sciences.
- [3] K. Jablokow, "Engineers as Problem-Solving Leaders: Embracing the Humanities," *IEEE Technology and Society Magazine*, vol. 26, no. 4, pp. 29-35, Winter 2007.
- [4] P. G. Northouse, *Leadership: Theory and Practice*. Edition 8. Thousand Oaks, CA: SAGE, 2018.
- [5] S. L. Connaughton, F. L. Lawrence, and B. D. Reuben, "Leadership Development as a Systematic and Multidisciplinary Enterprise," *Journal of Education for Business*, vol. 79, Iss.1, pp.46-51, 2003.
- [6] R. Bolden, "Leadership, Management, and Organisational Development," in *Gower Handbook of Leadership and Management Development*, R. Thorpe, Edition 8. London: Routledge 2010. pp. 117- 132.
- [7] P. A Heslen and L. A. Keating, "In learning mode? The role of mindsets in derailing and enabling experimental leadership and development," *The Leadership Quarterly*, vol. 28, iss.3, Jun. 2017.
- [8] S. A. Hezlett, "Enhancing Experience-Driven Leadership Development," *Advances in Developing Human Resources*, vol.18, iss. 3, 2016.
- [9] C. Brungardt, "The Making of Leaders: A Review of the Research in Leadership Development and Education," *Journal of Leadership Studies*, vol. 3, iss. 3, 1997.
- [10] K. C. Williams, "Student Portfolios: Authentic Assessment at its Best," *NACTA Journal*, vol. 61, Iss. 3, pp.264-266, Sep. 2017.
- [11] S. Jarrott and L.E. Gambrel, "The Bottomless File Box: Electronic Portfolios for Learning and Evaluation Purposes," *International Journal Portfolio*, vol. 1, no. 1, pp.85-94, 2011.
- [12] H. L. Chen and T. C. Black, "Using E-portfolios to Support an Undergraduate Learning Career: An Experiment with Academic Advising," *Educause Quarterly*, vol. 33, no. 4, 2010.
- [13] C. Herman and G. Kirkup, "Learners in transition: the use of ePortfolios for women returners to science, engineering and technology," *Innovations in Education and Teaching International*, vol.45, Iss. 1, pp.67-76, 2008.

- [14] L.M.S. Khoo, D.Maor, and R.Schibeci, "The engineering Eportfolio: Enhancing communication, critical thinking and problem solving and team work skills?," *World Academy of Science, Engineering and Technology*, pp.1027-1032, 2011.
- [15] H. C. Richardson, R. Ward, "Developing and Implementing a Methodology for Reviewing E-portfolio Products" The Centre for Recording Achievement, Wigan, U.K., Ver 1.0, March, 2005. Accessed on: January, 28, 2019. [online].
https://immagic.com/eLibrary/ARCHIVES/GENERAL/JISC_UK/J050330R.pdf
- [16] T. W. Knott, V. K. Lohani, G.V. Loganathan G. T. Adel, M.L. Wolfe, M. C. Paretti, K. Mallikarjunan T. M. Wildman, J. A. Muffo, and O. H. Griffin, Jr., "Using Electronic Portfolios in a Large Engineering Program," *Proceedings of American Society for Engineering Education Annual conference & Exposition*, 2005. Virginia Polytechnic Institute and State University.
- [17] M. Bhattacharya and M. Hartnett, "E-Portfolio assessment in higher education," in *37th Annual Frontiers In Education Conference- Global Engineering: knowledge Without Borders, Opportunities Without Passports, October 10-13 2007, Milwaukee, WI*, IEEE. 2008. Available: Google scholar, <https://ieeexplore.ieee.org/abstract/document/4418182> [accessed: 1/28/2019].
- [18] C. R. Corley and J. Zubizarreta, "The Power and Utility of Reflective Learning Portfolios in Honors," *Journal of the National Collegiate Honors Council*, vol. 13, no. 1, pp.63-76, Spr-Sum. 2012.
- [19] J. Zubizarreta, *The Learning Portfolio: Reflective Practice for Improving Student Learning*. San Francisco, CA: Jossey-Bass, 2009.
- [20] N. Carroll, L. Markauskaite, and R. A. Calvo, "E-Portfolios for Developing Transferable Skills in a Freshman Engineering Course," *IEEE Transactions on Education*, vol.50, no.4, pp.360-366, Nov. 2007.