Feedback-Seeking Behaviors

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Exploring Antecedents of Engineering Students' Indirect and Direct Feedback-Seeking Behaviors

Abstract. This paper reports an exploratory study regarding students' beliefs and feedback-seeking behaviors. Students believe that developing their engineering-identity involves cultivating their technical skills and they rely on feedback to provide competence-information with respect to engineering work. However, obtaining feedback can have negative cognitive, emotional, and motivational costs, such as when students doubt their skills, feel shame, and lack motivation to proceed. If engineering students seek feedback and experience shame, they may have maladaptive responses, including dropping out. We collected data from 133 junior-level mechanical (*n*=93) and electrical (*n*=40) engineering-students, taking their initial engineering-design classes for their (1) beliefs about engineering intelligence (fixed/growth mindsets), (2) perceptions of cost/value for seeking feedback, and (3) feedback-seeking behaviors (indirect feedback-monitoring, direct from instructors/peers). Results suggested that, when students have a growth mindset and value feedback, they may perceive feedback as a learning-resource that they can seek, either indirectly or directly. Engineering students who associate feedback with negative costs may not invest in feedback-seeking behaviors. These students may see feedback-seeking as hindering their ability to maintain good impressions, and thus, they are less motivated to risk their self-presentations.

1. Introduction

STEM-related innovators are needed for the U.S. to compete world-wide [1], the large attrition-rates of STEM (science, technology, engineering, and mathematics) college students have created national concerns [2][3]. Becoming an engineer, in particular, is complex and difficult —students "must understand and navigate this complex[ity] for successful professional formation and practice" [4]. Not surprisingly, students' development of their engineering-identity revolves around cultivating their technical skills [5] [6] and they rely on feedback to provide competence-information with respect to engineering work [7]. Thus, a core aspect of becoming an engineer, and identifying as an engineer, involves obtaining feedback. Feedback provides students with information about "whether or not results are correct" or, "if given at steps in the midst of a task, whether or not work is on a path that can lead to achievement" [8]. In Woods, Felder, Rugarcia, and Stice's [9], *The Future of Engineering Education: Developing Critical Thinking Skills*, they suggest that "The instructor's role is primarily that of a coach, encouraging the students to achieve the target attitudes and skills and providing constructive feedback on their efforts" (p. 109).

Unfortunately, obtaining feedback can have negative cognitive, emotional, and motivational costs, such as when students doubt their skills, feel shame, and lack motivation to proceed [10] [11] [12]. Early findings from an NSF-funded grant on engineering students' experiences of academic shame [13] suggest these experiences are common [14]. Not only is experiencing shame common in engineering education, Huff, et al. found that "experiences of shame were intertwined with their identity development" (pg. 3). While feedback is crucial to both developing engineering-skills and engineering-identity, receiving feedback can cause shame. This presents a dilemma for engineering students. If engineering students seek feedback and experience shame, they may have maladaptive responses, including dropping out of the program. The current research explored engineering students' beliefs, motivations, and perceived costs associated with seeking feedback to better understand their decision-making processes with respect to feedback. In the literature below, we provide information and research related to

feedback-seeking behaviors. In our research, we wanted to better understand factors that may influence students' *proactive* feedback-seeking.

1.1 Feedback-Seeking Behaviors

Research from organizational psychology [15], as well as recent research in learning a foreign-language [16] [17] [18], suggest that individuals may proactively seek feedback indirectly or directly. For example, obtaining indirect feedback involves monitoring the environment and being sensitive when feedback is given (to others or the self)—with the intent of using that information [15] [17], while obtaining direct feedback includes approaching an instructor or trusted peer. Deciding whether or not to obtain feedback involves weighing potential costs against potential benefits. The costs of seeking feedback include ego cost, (i.e., "the cost suffered from hearing negative feedback about the self;" [19], self-presentation cost, (i.e., "the cost of exposing one's uncertainty and need for help" [19], and effort cost (i.e., "the level of effort required to obtain feedback information" [15]. On the other hand, the value of seeking feedback is improving skills and performance [19]. How do engineering students decide which types of feedback to obtain, as well from whom to seek feedback? Furthermore, what personal and contextual factors affect engineering students' feedback-seeking behaviors? Anseel, Beatty, Shen, Lievens, and Sackett [20] argued that, "the key avenue to understanding how individual-differences and contextual factors affect feedback-seeking strategies is uncovering the underlying motivational dynamics" (p. 228).

Recent research in the domain of learning a foreign-language has demonstrated that several antecedents may influence the extent to which students seek feedback, such as students' beliefs about intelligence and perceived costs of feedback-seeking. For example, Papi, et al. [17] found that, when students believed intelligence grows with experience and knowledge (a growth mindset), they were more likely to value feedback, which in turn, predicted tendencies to seek both indirect and direct feedback. On the other hand, when students believed that intelligence was pre-determined and could not be changed (a fixed mindset), they were more likely to perceive that feedback-seeking had negative costs (e.g., they would look incompetent), which in turn, had a negative relationship with their feedback-seeking behaviors. Thus, Papi, et al. [17] found that students "make calculated decisions regarding whether to seek feedback, by what method, and from what source, based on their own perceptions of the costs and values associated with different feedback-seeking strategies" (pg. 205).

The research questions that guided our study were: 1) What are the relationships among engineering students' mindsets, perceived costs/value of feedback-seeking, and their feedback-seeking behaviors? 2) Are the relationships between students' mindsets and their feedback-seeking behaviors mediated by their perceptions of cost and value of feedback-seeking? Given that feedback is critical to the development of students' engineering skills and engineering-identity (e.g.,[7]), and that obtaining feedback can have powerful, negative impacts on cognitions, emotions, motivations, and learning-behaviors [11] [21], there is a gap in scholarly understandings of engineering students' feedback-seeking perceptions and behaviors. The research we report here provides foundational knowledge that can ultimately lead to interventions and better instructional practices.

2. Method

A total of 133 junior-level mechanical (*n*=93) and electrical (*n*=40) engineering-students, taking their initial engineering-design classes, were surveyed two weeks before their final exams. Students received an electronic invitation to the study that led them to a Qualtrics survey. Of the 133 participants, 118 (88%) were male, 15 (11%) were female. With respect to ethnicity, 79 students (59%) identified as White, 25 students (19%) identified as African-American, 20 students (15%) identified as Hispanic, 5 students (4%) identified as being of mixed ethnicity, 3 students (2%) identified as Asian, and 1 student (1%) identified as "other." Students were given extra-credit from the instructors for participating in the survey.

2.1 Instruments

After completing the informed consent, students were asked to rate each item for the extent to which it was true for them, using a 6-point Likert scale (1=Not at all True for Me; 6 = Very True for Me). All survey items were adapted from Papi, et al. [17], and included the following:

Mindsets. A total of 8 items assessed students' growth and fixed mindsets for engineering intelligence. Four items assessed growth mindsets (e.g., *No matter how much intelligence you have for engineering, you can always increase it*; $\alpha = .74$); and four items assessed fixed mindsets (*Your engineering intelligence is something that you can't change very much*; $\alpha = .81$).

Feedback Monitoring. A total of 9 items assessed students' indirect feedback monitoring (e.g., *When someone else was corrected on his/her design components, I paid careful attention*; $\alpha = .97$).

Feedback-Seeking Instructor. A total of 9 items assessed students' direct feedback-seeking from their instructor (e.g., *I sought feedback from my instructor about potential errors in my objective-statements;* $\alpha = .87$).

Feedback-Seeking Peers. A total of 6 items assessed students' direct feedback-seeking from their peers (e.g., *I asked other students for suggestions on how I could improve my design components;* $\alpha = .87$).

Value of Feedback. A total of 5 items assessed students' perceptions of the value of obtaining feedback (e.g., *Feedback on my technical writing can help me become a better professional engineer;* $\alpha = .83$).

Cost of Feedback. A total of 7 items assessed students' students' perceptions of the cost of obtaining feedback (e.g., *My colleagues would think poorly of me if I asked them for feedback on my problem statement;* $\alpha = .81$).

3.0 Results

3.1 Initial Analysis

To answer the first research question regarding the relationships among engineering students' mindsets, perceived costs/values of feedback, and feedback-seeking behaviors, we calculated Person bivariate-correlations among the variables. As Table 1 shows, students' engineering growth mindset was positively correlated with seeing the benefits of receiving feedback (r =.34, p<.001) as well as with all types of feedback-seeking behaviors (feedback-monitoring, r =.33, p<.001; feedback-instructors, r =.39, p<.001; feedback-peers, r =.17, p<.05). On the other hand, having a fixed mindset was positively associated with seeing costs associated with feedback (r =.18, p<.05) and negatively associated with seeing the benefits of feedback (r =-.21, p<.01). However, having a fixed mindset was not associated with any of the engineering students' feedback-seeking behaviors.

Table 1: Correlations among Variables

	Growth Mindset	Fixed Mindset	Feedback Monitoring	Feedback Instructors	Feedback Peers	Feedback Cost
Growth Mindset	—					
Fix Mindset	-.25**	—				
Feedback—Monitoring	.33***	-.06	—			
Feedback—Instructors	.39***	-.09	.78***	—		
Feedback—Peers	.17*	-.07	.43***	.54***	—	
Feedback—Cost	-.22**	.18*	-.22**	-.19*	-.06	—
Feedback—Value	.34**	-.21**	.69***	.65***	.33***	-.33***

Note: *p<.05; **p<.01; ***p<.001.

3.2 Predictions of Feedback-Seeking Behaviors

To answer the second question – whether mindsets predicted feedback-seeking behaviors, and if these relationships were mediated by students' perceived value/cost of seeking feedback, we conducted three step-wise regression analyses. Because students' ratings of fixed mindsets were not correlated with feedback-seeking behaviors, our mediation analysis focused on the extent to which students' perceptions of value mediated the relationship between students' growth mindsets and their feedback-seeking behaviors. The first step in the analysis used growth mindset to predict a specific feedback-seeking behavior. In the second step, value was added with growth mindset to predict a specific feedback-seeking behavior (potential mediator). If valuing feedback plays a mediating role between growth mindset and feedback-seeking behaviors, then: 1) having a growth mindset should predict feedback-seeking behaviors, and 2) if valuing-feedback is added to the prediction of feedback-seeking behaviors (along with growth mindset) — and results show that growth mindset is no longer a significant predicator of feedback-seeking behaviors — then, their valuing feedback mediates the relationship between growth mindset and feedback-seeking behaviors. Below, we describe the results of the regression analyses.

Feedback Monitoring. With Feedback Monitoring as the outcome variable (see Table 2), Growth Mindset was a significant predicator in the first step of the regression (R^2=.33, *p*<.001). When Valuing Feedback was added to the prediction, Growth Mindset became non-significant (*p*=.11). Thus, the relationship between Growth Mindset and Feedback Monitoring was fully mediated by students' Value of Feedback. This finding suggests that valuing feedback may be the main reason engineering students are sensitive to, and pay attention to, feedback-information within the environment. Still, having a growth mindset is important. Results showed that 49% of the total variance for predicting students' feedback-monitoring could be explained by the combination of students' growth mindset and their valuing feedback.

Table 2. Regression of Mindsets and Valuing Feedback Predicting Feedback-Monitoring

Outcome	Predicator	*B*	Std. Error	*Beta*	*T*	Sig.	R^2
Feedback Monitoring	(Constant)	3.50	.40		8.66	<.001	
	Growth Mindset	.32	.08	.33	3.98	<.001	
							R^2=.11
Feedback Monitoring	(Constant)	1.65	.36		4.61	<.001	
	Growth Mindset	.11	.07	.11	1.92	.11	
	Value Feedback	.61	.06	.66	9.96	<.001	
							R^2=.49

Feedback-Instructor. With Feedback-from-Instructor as the outcome variable (see Table 3), Growth Mindset was a significant predicator in the first step of the regression (R^2=.15, *p*<.001). When Valuing Feedback was added to the prediction, the magnitude of the impact of Growth Mindset on predicting students' feedback-seeking from their instructor lowered (*p*=.005), but remained significant. Thus, the relationship between Growth Mindset and Feedback Monitoring was partially mediated by students' Value of Feedback. Therefore, having a growth mindset *and* valuing feedback were both important for students seeking feedback from their instructor.

Table 3. Regression of Mindsets and Valuing Feedback Predicting Feedback-Instructor

Outcome	Predicator	*B*	Std. Error	*Beta*	*T*	Sig.	R^2
Feedback Instructor	(Constant)	2.51	.39		6.50	<.001	
	Growth Mindset	.39	.08	.39	4.91	<.001	
							R^2=.15
Feedback Instructor	(Constant)	.90	.37		2.45	.02	
	Growth Mindset	.19	.07	.20	2.89	<.005	
	Value of Feedback	.52	.06	.59	8.61	<.001	
							R^2=.46

Feedback-Peers. With Feedback-from-Peers as the outcome variable (see Table 4), Growth Mindset was a small, yet significant predicator in Step 1 (R^2=.03, *p*=.05). When Value of Feedback was added to the prediction, Growth Mindset became non-significant, while Value of Feedback was significant. Thus, students were more likely to pursue feedback from peers if they valued feedback.

Thus, the relationship between growth mindset and feedback-from-peers was fully mediated by students' valuing feedback. This finding suggests that valuing feedback may be a reason that engineering students seek feedback from their peers. Still, having a growth mindset may be important. Results showed that 12% of the total variance for predicting Feedback-from-Peers could be explained by the combination of students' growth mindset and their valuing feedback.

Table 4. Regression Results of Mindsets and Valuing Feedback Predicting Feedback-Peers

Outcome	Predicator	*B*	Std. Error	*Beta*	*t*	Sig.	R^2
Feedback Peers	(Constant)	2.61	.64		4.10	<.001	
	Growth Mindset	.26	.13	.17	1.99	.05	
							R^2=.03
Feedback Peers	(Constant)	1.29	.71		1.81	.07	
	Growth Mindset	.10	.13	.07	.76	.45	
	Value of Feedback	.42	.12	.31	3.56	<.001	
							R^2=.12

4. Conclusions and Implications

Obtaining feedback is a source of information that impacts engineering students' skill-development and engineering identity-development. The purpose of our research was to better understand factors that may influence students' *proactive* feedback-seeking behaviors. As a step towards understanding this phenomenon, we explored mechanical and electrical engineering students' beliefs about engineering intelligence and perceived value/cost associated with feedback. One limitation of our study, is that we focused on self-report data. Using other data-sources, such as obtaining students' perceptions about feedback-scenarios, conducting interviews, using diaries, and teachers' reports could provide validation of our survey findings and provide additional information about students' feedback-seeking attitudes and behaviors. Furthermore, although our findings are limited to students in two majors, as well as being limited to one university; our results provide initial information into potential factors that support engineering students' proactive feedback-seeking behaviors.

Our findings are aligned with those of Papi et al. [16] [17] in that, students' beliefs about the malleability of their engineering intelligence was associated with the value they had on obtaining feedback. Their valuing feedback, in turn, influenced their decisions about whether, or

not, to seek feedback and by which methods. Thus, engineering students may thoughtfully and purposely choose to proactively seek feedback depending on their value estimations, which are influenced by having a growth mindset. Valuing feedback was particularly important for monitoring the environment for feedback-related information, i.e., indirect feedback monitoring, which fully mediated the relationship between students' growth mindset and their monitoring the environment for feedback messages. Because growth mindset was indirectly related to feedback monitoring, perhaps students with a fixed mindset could be encouraged to use this type of feedback-seeking method. Monitoring the environment for feedback messages does not threaten one's self-presentation and does not incur costs of feedback-seeking from instructors or peers. Therefore, indirect feedback messages may be more accessible to students with a fixed mindset. Instructors could call students' attention to instances when he/she is giving feedback to a specific student, so that all students could hear the feedback. Bringing attention to in-the-moment feedback would make feedback messages more explicit to all students. Instructors also could provide indirect messages of feedback, such as providing lists of potential errors or reminding students of potential errors. Whole-class problem-solving may also provide indirect messages of feedback-information for all to hear.

Our findings suggest that, when students believe that they can increase their engineering intelligence, they are more likely to value feedback and to seek feedback. They may perceive feedback as a learning resource that they are willing to actively seek. Having a growth mindset *and* valuing feedback was particularly important for students seeking feedback from their instructors, while valuing feedback alone was most important for students seeking feedback from their peers. Thus, students were more likely to seek feedback from the instructor if they had a growth mindset. Seeking feedback from the instructor may be perceived as more threatening than seeking feedback from peers. Future research could explore this facet of students' feedback-seeking behaviors. If instructors are perceived as threatening, this would present students with challenges in seeking feedback. However, our results suggested that students were likely to seek feedback from their instructors if they valued feedback. Still, future research should investigate the messages that instructors provide students that may facilitate or hinder students' proactive feedback-seeking from instructors. On the other hand, if obtaining feedback from peers is less threatening, instructors could help students obtain peer feedback. For example, instructors could provide opportunities for students to engage in peers' brain-storming sessions, or they can make obtaining peer-feedback part of design-projects.

Having a fixed mindset may not necessarily preclude students from seeing the value of seeking feedback. For example, if students perceive that engineering intelligence is fixed, and they believe they have high engineering intelligence, they may not see feedback as threatening. Future research should explore this facet of students' beliefs and how it hinders or supports their feedback-seeking. Not surprising, engineering students who perceive that feedback-seeking has negative costs, may not invest in feedback-seeking behaviors. These students may see engineering intelligence as somewhat fixed, or they may feel they should have required knowledge and skills, and therefore, should not need feedback. These students may see feedback-seeking as hindering their ability to maintain good impressions, and thus, they are less motivated to risk damaging their perceived status. Future research could explore students' perceptions about the importance of impression-management as a component of their feedback-

seeking choices and how being concerned with impression-management affects engineering-identity.

In our study, we examined only the learning-value and self-presentation costs of feedback-seeking. Future studies could explore other costs and values such as ego and effort costs [15], and image-enhancement and appraisal values [22] to obtain a more comprehensive understanding of motivational mechanisms underlying engineering students' feedback-seeking behaviors. Future research should also investigate other factors that may influence students' perceptions of the costs and value of feedback-seeking. These could include students' previous experiences with feedback as well as how feedback-seeking is related to their current levels of proficiency/skills. Students' previous experiences and their perceived skill-levels may indicate different motivational and feedback-seeking patterns.

Another area for future study is teacher–student relationships. The feedback-environment that teachers set, including (1) how errors are perceived in the class, (2) teachers' classroom goal-structures (e.g., focus on mastering skills or focus on obtaining the correct answer), and (3) assessment standards. These factors may impact students' perceptions of the costs and values associated with proactive feedback-seeking. Research on engineering students' feedback-seeking behaviors could also investigate the timing and frequency with respect to the types of feedback students may seek (e.g., process-feedback, product-feedback, indirect-feedback, direct-feedback, etc.), the source of feedback (e.g., teacher vs. peers), and the outcomes of feedback-seeking in terms of students' skill- development accuracy [19].

This study was an initial attempt to understand engineering students' proactive feedback-seeking beliefs and behaviors. Our findings provided foundational information to begin to understand engineering students' beliefs and perceptions as well as the types of feedback-seeking behaviors students may use to obtain indirect and direct feedback. We believe that a future mixed-methods approach could help reveal more feedback-seeking strategies that students use as well as reveal when, from whom, and under which conditions, they are willing to seek feedback. The culmination of this research can help develop interventions to promote students' beliefs in the malleability of their skill-development, support their valuing feedback, and promote their proactive feedback-seeking. We believe that feeling comfortable with feedback-seeking from multiple sources will ultimately support students' life-long learning and on-going skill-development.

References

[1] George, M.D., Bragg, S., de los Santos, A.G. Jr., Denton, D.D., Gerber, P., Lindquist, M.M., Rosser, J.M., Sanchez, D.A. & Meyers, C. (1996). *Shaping the future: New expectations for undergraduate education in science, mathematics, engineering, and technology*. Arlington, VA: National Science Foundation

[2] Chen, X. (2013). STEM Attrition: College students' paths into and out of STEM fields. *Statistical Analysis Report. NCES 2014-001*. National Center for Education Statistics.

[3] Chen, X. (2015). STEM attrition among high-performing college students in the United States: Scope and potential causes. *Journal of Technology and Science Education*, *5*(1).

[4] National Science Foundation (2017) *PFE: Research Initiation in Engineering Formation (PFE: RIEF*). Retrieved from https://www.nsf.gov/pubs/2017/nsf17514/nsf17514.htm

[5] Chachra, D., & Kilgore, D., & Loshbaugh, H., & McCain, J., & Chen, H. (2008, June), *Being and Becoming: Gender and Identity Formation of Engineering Students*. Paper presented at 2008 Annual Conference & Exposition, Pittsburgh, Pennsylvania. https://peer.asee.org/3597

[6] Meyers K. L., Ohland M. W., Pawley A. L., Silliman S. E., & Smith K. A. (2012). Factors relating to engineering identity. *Global Journal of Engineering Education,14*(1), 119-131.

[7] Godwin, A. F. (2014). *Understanding female engineering enrollment: Explaining choice with critical engineering agency*. Unpublished doctoral dissertation. Retrieved from: http://tigerprints.clemson.edu/all_dissertations/1787

[8] Butler, D. L. & Winne, P. H. (1995). Feedback and self-regulated learning: A theoretical synthesis, *Review of Educational Research*; *65*(3); 245-281.

[9] Woods, D. R. Felder, R. M., Rugarcia, A. & Stice, J. E. (2000). The future of engineering education: Developing critical thinking skills. *Chemical Engineering Education, 34*(2), 108–117 (2000).

[10] Turner, J. E., & Husman, J. (2009). Emotional and cognitive self-regulation following perceptions of failure and experiences of academic shame. *Journal of Advanced Academics*, *20(1)*, 138-173.

[11] Turner, J. E., Husman, J., & Schallert, D. L. (2002). The importance of students' goals in their emotional experience of academic failure: Investigating the precursors and consequences of shame. *Educational Psychologist*, *37(2)*, 79-89.

[12] Turner, J. E., & Schallert, D. L. (2001). Expectancy-value relationships of shame reactions and shame resiliency. *Journal of Educational Psychology*, *98(2)*, 320-329.

[13] Huff, J. L, Walther, J., Sochacka, N., Sullins, J., & Miller, S. (2017). *Inclusion, exclusion, and socialization in engineering programs – Investigating key affective socio-psychological mechanisms in professional formation*. NSF EEC 1752897. $498,958. Award Period: 09/15/2017 – 08/31/2020.

[14] Huff, J. Okai, B., Shanachilubwa, K., Sochacka, N., & Walther, J., (2019). Unpacking professional shame: Patterns of white male engineering students living in and out of threats to their identities. Unpublished manuscript.

[15] Ashford, S. J. & Cummings, L. L. (1983). Feedback as an individual resource: Personal strategies of creating information. *Organizational Behavior and Human Performance, 32*, 370–398.

[16] Papi, M., Bondarenko, A. V., Wawire, B., Jiang, C., & Zhou, S. (2019). Feedback-seeking behavior in second language writing: Motivational mechanisms. *Reading and Writing: An Interdisciplinary Journal.* doi:http://dx.doi.org.proxy.lib.fsu.edu/10.1007/s11145-019-09971-6

[17] Papi, M., Rios, A., Pelt, H., & Ozdemir, E. (2019). Feedback-seeking behavior in language

learning: Basic components and motivational antecedents. *The Modern Language Journal, 103*(1), 205-226. doi:http://dx.doi.org.proxy.lib.fsu.edu/10.1111/modl.12538

[18] Waller, L. & Papi, M. (2017. Motivation and feedback: How implicit theories of intelligence predict L2 writers' motivation and feedback orientation. *Journal of Second Language Writing, 35*, 54–65.

[19] VandeWalle, D., Ganesan, S., Challagalla, G. N., & Brown, S. P. (2000). An integrated model of feedback-seeking behavior: Disposition, context, and cognition. *Journal of Applied Psychology, 85*(6), 996–1003.

[20] Anseel, F., Beatty, A. S., Shen, W., Lievens, F., & Sackett, P. R. (2015). How are1 we doing after 30 years? A meta-analytic review of the antecedents and outcomes of feedback-seeking behavior. *Journal of Management, 41*(1), 318-348. doi:http://dx.doi.org.proxy.lib.fsu.edu/10.1177/0149206313484521

[21] Turner, J. E. & Waugh, R. M. (2007). A dynamical systems perspective regarding students' learning processes: Shame reactions and emergent self-organizations. In P. A. Schutz & R. Pekrun (Eds.) *Emotions in education* (pp. 125-145). San Diego: Academic Press.

[22] Park, G., Schmidt, A. M., Scheu, C., & DeShon, R. P. (2007). A process model of goal orientation and feedback seeking. *Human Performance, 20*(2), 119–145.