Defining Academic Engineering Education Roles within the United States

Cheryl A. Bodnar[a]; Erin J. McCave[b], Courtney Smith-Orr[c], Alexandra Coso Strong[d], Courtney Faber[b], Walter Lee[e]

Rowan University[a], University of Tennessee Knoxville[b] , University of North Carolina at Charlotte[c] ,Florida International University[d], Virginia Tech[e]

Corresponding Author Email: bodnar@rowan.edu

ABSTRACT

CONTEXT
Engineering education is an interdisciplinary research field where scholars are commonly embedded within the context they study. Engineering Education Scholars (EES), individuals who define themselves by having expertise associated with both engineering education research and practice, inhabit an array of academic positions, depending on their priorities, interests, and desired impact. These positions include, but are not limited to, traditional tenure-track faculty positions, professional teaching or research positions, and positions within teaching and learning centers or other centers. EES also work in diverse institutional contexts, including engineering disciplinary departments, first-year programs, and engineering education departments, which further vary their roles.

PURPOSE OR GOAL
The purpose of this preliminary research study is to better understand the roles and responsibilities of early-career EES. This knowledge will enable PhD programs to better prepare engineering education graduates to more intentionally seek positions, which is especially important given the growing number of engineering education PhD programs. We address our purpose by exploring the following research question: How can we describe the diversity of academic or faculty roles early-career EES undertake?

APPROACH OR METHODOLOGY/METHODS
We implemented an explanatory sequential mixed-methods study starting with a survey (n=59) to better understand the strategic actions of United States-based early-career EES. We used a clustering technique to identify clusters of participants based on these actions (e.g., teaching focused priorities, research goals). We subsequently recruited 14 survey participants, representing each of the main clusters, to participate in semi-structured interviews. Through the interviews, we sought to gain a more nuanced understanding of each participant's actions in the contexts of their roles and responsibilities. We analyzed each interview transcript to develop memos providing an overview of each early-career EES role description and then used a cross case analysis where the unit of analysis was a cluster.

ACTUAL OUTCOMES
Five main clusters were identified through our analysis, with three representing primarily research-focused day-to-day responsibilities and two representing primarily teaching-focused day-to-day responsibilities. The difference between the clusters was influenced by the institutional context and the areas in which EES selected to focus their roles and responsibilities. These results add to our understanding of how early-career EES enact their roles within different institutional contexts and positions.

CONCLUSIONS/RECOMMENDATIONS/SUMMARY
This work can be used by graduate programs around the world to better prepare their engineering education graduates for obtaining positions that align with their goals and interests. Further, we expect this work to provide insight to institutions so that they can provide the support and resources to enable EES to reach their desired impact within their positions.

KEYWORDS
Engineering Education Scholars, Career pathways, Mixed methods research, Higher education

Motivation

Over the last few decades, engineering education research has gained academic recognition (Froyd and Lohmann, 2014). This development can largely be attributed to the community's 'pioneers,' or the first faculty members to bring to the forefront the possibility of an academic position within engineering education research. These individuals are recognized as significant contributors to (or shapers) of the field (Atman, Turns, & Yasuhara, 2021) specifically one that explores ways to develop, understand, support and engage engineers of all backgrounds and levels of education. Ultimately, recognition of engineering education as a viable academic career path led to the creation of programs and departments with a focus in this area (Benson et al., 2010).

Graduate students pursuing PhDs in engineering education now have a variety of career paths they can follow. Examples can include teaching or research focused positions at institutions of varying research intensities (high research intensity to primarily teaching institutions) alongside staff based positions (McCave et al., 2020). However, many students lack clarity on the types of roles and responsibilities that exist within engineering education academic positions and how to select the position that would be the best fit for them personally. Similarly, though academic institutions are aware of the value that an engineering education researcher can bring to a department or program (Benson et al., 2010), they lack clarity on how to support Engineering Education Scholars (EES), individuals who have expertise in both engineering education research and practice, and what resources EES need to have their desired impact (Coso Strong et al., 2021).

For these reasons, it is important to study how EES define their roles and responsibilities and how these definitions may extend beyond the boundaries of the specified job description. This knowledge will enable programs to better prepare engineering education graduates to more intentionally seek positions, which is especially important given the growing number of PhD programs being established that graduate EES. We address this goal by exploring the following research question in our preliminary research study: How can we describe the diversity of academic or faculty roles early-career EES undertake?

Background

Faculty roles typically encompass a distribution of responsibilities between teaching, research, and service. Despite these defined "buckets," faculty define their roles depending on their professional and personal goals (Kuntz, 2012; Reybold and Alamia, 2008). Modifying job roles and responsibilities to achieve intended desires and goals from a position is not unique to academic environments and is known as "job crafting" in the organizational behavior literature. Berg, Dutton, and Wrzesniewski (2008) found that individuals who modify their positions through job crafting do so in three distinct ways: 1) altering the boundaries of their jobs, 2) changing the relationships they have at work, and 3) altering how they perceive the tasks that are associated with their position. Reybold and Alamia (2008) found that female faculty members who are focused upon their own professional advancement tend to specifically align their roles and responsibilities with what is needed to help them advance in their career. Although, as female faculty progressed further in their career and grew broader awareness of the expectations associated with an academic position, they could feel less need to meet others' expectations. For this reason, it is possible for two individuals in the same position to perform very different tasks depending on their specific goals. This research also supports why prior literature has shown that how individuals describe their roles and responsibilities may not align with their job description (Wrzesniewski and Dutton, 2001).

Methods

To understand how U.S.-based early-career EES describe their roles and responsibilities, we implemented an explanatory sequential mixed-methods research study with equal weight

provided to the quantitative and qualitative strands of data (Creswell and Plano Clark, 2011). We first collected survey responses (n=59) that were analyzed using hierarchical cluster analysis to identify groups of EES who take similar actions in their roles. We then conducted semi-structured interviews (n=14) with two to four early-career EES from each main cluster to further distinguish the clusters and understand the nuances associated with how individuals define their roles and responsibilities. Our mixed-methods approach aligns with the recommendations of Wrzesniewski and Dutton (2001), who suggest that survey items alone cannot easily capture job crafting. To ensure reliability in the research findings, Walther et al. (2013)'s Q3 framework was applied throughout the qualitative data collection and analysis process.

Quantitative Data Collection and Analysis

We developed a survey instrument to capture the general day-to-day responsibilities of early-career EES through a qualitative analysis of reflection data collected from six early-career EES (Smith-Orr et al., 2019). The final survey focused on three key areas: 1) faculty impact, 2) strategic actions, and 3) influencers. For this study, we focused on the strategic action items (n=18)—i.e., intentional actions taken towards professional goals—because they provided the most detailed information about the actions EES take within their roles. These items prompted participants to report how often they participated in specific activities related to research, teaching, advising, service, and administration in an academic year. Each item was measured on a seven-point scale from never to more than once a week.

We initially sent the survey to 95 U.S. based early-career EES in October 2018. This list was generated based on publicly available data of engineering education PhD graduates, membership in American Society for Engineering Education (ASEE), and the faculty directories within engineering education centers and programs. We also distributed the survey through the ASEE Educational Research Methods (ERM) division listserv to mitigate selection bias in our initial sample identification. We received 53 responses (~56% response rate) alongside our 6 responses (total n=59). The demographics of the sample are summarized in Smith-Orr et al. (2019).

We used hierarchical cluster analysis to group participants based on their strategic actions. We selected hierarchical cluster analysis because it is a more exploratory clustering approach that does not require the researcher to predefine the number of expected clusters (Kaufman and Rousseeuw, 2005). We ran the cluster analysis both with and without data scaling; used Euclidean and Gower proximity matrices as they are recommended to be used with categorical data; and tested both Ward's and complete methods. The cluster analysis was run in R using the anges function for agglomerative nesting in the Cluster package (Maechler et al., 2021). Based on fit indices, we selected the agglomerative clustering solution that used non-scaled data, Gower proximity matrix, and Ward's cluster method.

The final clustering solution included eight distinct clusters that showed variability in a subset of strategic actions (refer to Table 1). To characterize the clusters we pulled the responses to each strategic action item for every participant and calculated an average score for each item. We also looked at the demographic information provided by the participants in each cluster to look for patterns among position types. We decided to focus our further investigation on five main clusters. The three clusters that were not included in further analysis were small (three individuals or less) and distinct in that they included participants who had been in the field longer than other participants or recently started new positions.

Table 1: Strategic Action Survey Items Showing Differences Across Clusters (where R= Research, T= Teaching, and S= Service)

Item	Item Text
R1	Conducting Engineering Education Research
R2	Creating or Maintaining Research-Practice Partnerships
R3	Writing Journal Articles, Conference Papers, Books, etc.
T1	Advising or Mentoring Undergraduate Students
T2	Advising or Mentoring Graduate Students
T3	Advising or Mentoring Post Graduate Fellows
T4	Creating or Modifying Curriculum
T5	Implementing New Pedagogical Strategies
T6	Designing Course Material
S1	Participating in or leading student programs (outreach, study abroad, service learning, etc.)
S2	Giving education-related advice to colleagues
S3	Discussing engineering education research with local colleagues

Qualitative Data Collection and Analysis

We recruited 14 survey participants to participate in semi-structured interviews. At least two EES from each cluster were recruited and we aimed to have a diverse sampling by race, gender, engineering education training, and current institution. Two researchers conducted the interviews. Multiple prompts were included in the interview, but for this preliminary study analysis was focused upon, "What are the responsibilities associated with this position?".

Three researchers conducted the data analysis, developing memos for each participant that described the following categories: Role Description, Goals, Meaning Making, Strategic Actions, and Impact. To develop these memos, the researchers first coded the transcripts to identify words, phrases and paragraphs that aligned with each category. Three of the fourteen transcripts were coded by all three researchers. Each researcher was then assigned a category and was tasked with drafting that portion of the memo based on the coded transcripts of all three researchers. The researchers wrote the initial memo section based on their own coding of the transcripts and then went back and added additional codes or comments that were not accounted for from their own coding of the transcript. The researchers also highlighted any discrepancies seen across all three versions of the coded transcript. Meaning Making and Impact were written collectively by the three researchers to complete the preliminary memo for three participants. These three memos were then shared across the entire six-member research team for consensus and any questions or comments were discussed by the group.

Having established clarity around the codes and memo writing process, each researcher was assigned four of the remaining transcripts to serve as the primary coder and four as the secondary coder. Both researchers read and coded each transcript before coming together to reconcile overlap or differences in coding. The primary coder was then responsible for drafting the full memo, which was also reviewed by the secondary coder.

During the analysis portion, there were two transcripts that were removed from the sample: one due to the inaudibility of the audio recording and the other due to a change in positions between the survey and the interview.

Limitations

Given that the survey was based on the qualitative analysis of our own reflections on our roles within our institutions, we may have different interpretations of roles and responsibilities related to EES positions from survey respondents thus influencing the clusters that were

derived. We also acknowledge that we are capturing self-report data on faculty members' perceptions of their actions and approach to their positions, which can be influenced by the time of the semester.

Results

Quantitative Results

Through our cluster analysis, we identified eight distinct clusters representing the different actions taken by early-career EES. However, as previously stated, we focused our analysis on five main clusters. Across the clusters, all participants reported frequently spending time teaching undergraduate and/or graduate students and completing general administrative tasks. All participants reported spending little time presenting research outside or within the institution, and contributing to national and international reports. Details about the differences between clusters can be found in Table 2, along with reference to their ratings on specific items from the survey (summarized in Table 3).

Table 2: Differences between clusters. (Descriptions of Institution Type - R1: Doctoral Universities – Highest research activity; R2: Doctoral Universities – Higher research activity; R3: Doctoral Universities – Moderate research activity; PTI - Primarily Teaching Institutions.)

Cluster	Position Track	Institution Type	Research Quantity	Teaching or Advising	Service or Administration
1	71% Tenure; 29% Non-tenure	86% R1; 14% R2	Significant amount	Primarily mentor grad students	Minimal curriculum involvement, provide EngEd advice to colleagues
2	All tenure	50% R1; 25% R2	Significant amount	Mentor grad students and postdocs	Minimal curriculum involvement, involved in supporting student programs
3	87% Tenure	67% R1; 6% R2; 27% R3	Significant amount	Mentor undergrad and grad students	Involved in curriculum initiatives, provide EngEd advice to colleagues
7	75% Tenure	25% R1 12.5% R2; 12.5% R3; 50% PTI	Minimal amount	Mentor undergrad students only	Significant curriculum involvement, some involvement supporting student groups, provide EngEd advice to colleagues
8	61% Tenure; 23% Non-tenure; 16% No tenure	23% R1; 15% R2; 23% R3; 39% PTI	Little to no research	Mentor undergrad students only	Some curriculum involvement, provide EngEd advice to colleagues

Table 3: Average Item Scores for Clusters (where 1 = Never and 7 = More than once a week)

Cluster # (Sample Size)	Research			Teaching or Advising						Service or Administration		
	R1	R2	R3	T1	T2	T3	T4	T5	T6	S1	S2	S3
Cluster 1 (n=7)	6.86	5.14	4.86	4.00	6.29	1.00	4.57	3.43	3.57	2.86	4.57	5.14
Cluster 2 (n=8)	6.00	4.75	4.50	4.00	6.38	4.13	3.75	3.75	3.50	4.50	3.75	3.63
Cluster 3 (n=15)	6.60	4.93	4.87	5.93	6.80	2.20	5.40	5.07	5.53	2.67	5.47	6.20
Cluster 4* (n=3)	7.00	7.00	7.00	5.33	5.67	2.20	5.67	6.00	6.00	4.00	6.33	6.67
Cluster 5* (n=2)	1.50	1.00	1.00	6.00	1.00	6.00	5.00	2.50	4.50	1.00	4.50	2.00
Cluster 6* (n=3)	5.67	5.67	3.00	2.33	2.00	1.00	2.67	2.33	2.00	2.67	3.67	3.00
Cluster 7 (n=8)	4.38	2.50	3.00	5.50	1.50	1.33	6.75	5.25	6.88	4.00	5.00	4.50
Cluster 8 (n=13)	5.77	3.69	3.23	5.17	2.08	1.08	4.31	4.38	5.15	2.92	4.23	4.38

*Indicates clusters that weren't considered as part of further analysis

Qualitative Results

Across clusters, participants discussed their position, roles, and responsibilities in terms of teaching, research, and service. Yet, how the interviewees within each cluster described what they did to fulfill these criteria differed. For clusters 1-3, EES focused primarily on research activities. The slight differences observed were based on the approaches they took towards their teaching, advising, and service roles and responsibilities. Whereas, EES within clusters 7 and 8 described roles that are more focused on teaching compared to research.

In cluster 1 (n=3), research EES activities were focused on writing grants, receiving grants, and fulfilling grant funding requirements through research activities, which included mentoring graduate and undergraduate students funded through these grants. In discussing service responsibilities, many of the EES within cluster 1 focused on graduate program development and service within their department, university, and field. One such area of service was in faculty development. One participant noted,

"*So individual faculty members that want to try something new in their class, having a couple of days in the summer where we can kind of run them through what that means, what that looks like, how they should collect data to know if it's working or not. And then kind of how to publish, you know, how to do it in a way that you could then potentially publish from that...*"

EES in cluster 1 mainly taught graduate-level courses, however one participant discussed how their teaching load could also include teaching large, first-year courses. They also reported teaching a maximum of two courses a semester, with variation being based upon other responsibilities. For example, one participant discussed their reduced teaching load,

"*the standard load was gonna be two courses per semester. What a course was is something we always talk about here, the teaching first year, but we hadn't really worked that out at the grad level. So it was just gonna be two courses a year, and then for the first two years, I did have a 50% reduction. So it was one and one, but again, those were new courses that weren't developed.*"

EES interviewed from cluster 2 (n=2) discussed their teaching responsibilities more, including curriculum and course development being a larger portion of their positions and roles. While both participants talked about teaching a full load, the first described teaching three courses a year on a semester system and the second reported teaching six courses a year on the quarter system. This discrepancy between the number of courses taught a year highlights the fact that EES interpret full loads of teaching differently. Many of the courses EES in this cluster taught were focused on education, but could also include outreach and workshops related to the K-12 educational space. Both EES discussed that initially research was not the focus of their position and teaching took priority,

"*research work that is hard to fit in, especially those first couple of years when, like I mentioned, the teaching seemed to take more time*".

When discussing research, their actions included obtaining research funding, conducting project work, and publishing the results. Both participants talked about mentoring and advising their research students, one specifically stating,

> "...as an advisor, you kind of work them through that whole process. Oftentimes they work for you if you have a project that funds them, and they work in conducting the research that you are funded to do. And also just kind of giving them hopefully professional development advice and, and direction toward their career."

Lastly, participants in cluster 2 discussed their service responsibilities, noting that much of their service was in departmental level committees focused on curriculum and then field-level service through reviewer functions.

Similar to faculty in both cluster 1 and 2, cluster 3 EES (n=3) focused their time on research activities such as grant writing, bringing in funding, publishing, advising graduate students and undergraduate researchers, and utilizing their summer for research activities. For example, one EES commented about the summer saying,

> "the rest of those two months are spent catching up on everything that I don't get done on campus… a lot of the research ends up getting pushed backwards towards the summer months."

While EES in cluster 3 are mainly focused on research, they also spend time teaching. Their teaching included graduate course development and mentoring student teams within classes. Multiple EES in cluster 3 noted they started their positions with a reduced teaching load while they focused on building a research program. Some continued with a reduced teaching load due to research funding. Lastly, EES in cluster 3 discussed their diverse service responsibilities, which included departmental, college, and university level service. More than one EES in the cluster described their departmental service as including graduate program service and search committees and their university service including a position as a program assistant director.

EES interviewed in cluster 7 (n=2) held teaching focused positions at primarily teaching institutions. While these EES did some research, their main responsibility was to teach. They teach full loads of 3-4 classes a semester. Along with teaching, cluster 7 EES spend a good amount of their time meeting with students and holding office hours. Beyond their teaching responsibilities, they have numerous service responsibilities that span departmental activities up to university level service. The breadth of the service they do depends on their position and the needs of their department, college, and university, however both of the EES noted that departmental service is where most of their service related activities occur. For example, one EES talked about their service related to student recruitment and advising within their small department,

> "since there's only two engineering faculty on my campus, I do a lot of the recruitment stuff, a lot of advising…"

In cluster 8 (n=4), the EES interviewed were split across tenure-track and non-tenure track positions but all EES were in positions where teaching was their main responsibility. Many of these EES were teaching full loads and doing major curriculum development for the courses they taught. Two EES mentioned that they would teach a summer course periodically. Three EES in this cluster noted that they had negotiated a reduced teaching load due to administrative roles they had taken on. For this cluster, service was a large part of their positions either through administrative roles or departmental, college, or field-level responsibilities. For example, one EES describes their service responsibilities as,

> "... work outside of our normal kind of responsibility. So the academy research council chair position I have is a service position. You know, I'm contributing to the academy in other ways. I'm an officer in charge of the [student organization]."

Some of the service responsibilities that EES talked about included search committees, student outreach and recruiting, student organization advising, and professional society positions. Many of the EES within cluster 8 discussed that they conducted some form of research, specifically in getting grants funded and managing multiple projects. Cluster 8 EES

noted that they published their work at conferences rather than journals and needed to dedicate time in the summer to their research endeavors.

Conclusions

Our preliminary work has demonstrated that early-career EES undertake a variety of roles and responsibilities depending on their institutional context. As was identified in McCave et al. (2020), there are many types of jobs that EES can pursue, but how EES structure their work within these positions can vary depending on the resources and support they are provided (Coso Strong et al., 2021) and the institutional context.

Although clusters 1 through 3 could generally be described as research focused, the manner in which each of these EES described their positions varied. Cluster 1 was observed to be focused on graduate program and faculty development with teaching responsibilities most commonly at the graduate level. The high priority these EES put on research activities aligns with their positions being primarily situated in high research intensity institutions (R1). In contrast, EES from cluster 2 were more involved in curriculum development and teaching as it related to education within science and engineering as well as K-12 settings. The emphasis these EES placed on describing teaching elements associated with their positions, although in primarily research-based roles, is reflective of their positions representing a diversity of institutional contexts. Finally, cluster 3 EES commented on how research was a key focus of their positions but noted that it was not always possible to get all the work they would like done during the academic year due to their teaching responsibilities. It is possible that since cluster 3 EES represent a broader cross-section of research institutions than cluster 1, they are not provided with as much teaching load release to allow time to focus on research related efforts. Cluster 3 EES also noted that they spent time mentoring student teams within classes, which was not mentioned by EES in either of the other two clusters.

In contrast, EES from clusters 7 and 8 were found to have primarily teaching-based responsibilities. The difference in role focus may be related to their institutional context with no more than 25% of positions in either cluster being located at high research intensity institutions (R1). Cluster 7 EES described how they were heavily involved in departmental service activities including recruitment and retention. They were expected to conduct research although the time for doing so had to be worked around their other responsibilities. Cluster 8 differed from cluster 7 based on position types with a split between tenure and non-tenure track based roles. These EES noted how they occasionally take on summer teaching and administrative assignments to lighten their teaching load.

This preliminary study has shown that the reality of the roles and responsibilities of early-career EES in academic environments vary based on institutional context. The survey responses and follow-up interviews indicate that although positions may appear similar there are often key differences in roles due to institutional contexts and job crafting approaches that faculty members may take. The amount of job crafting an individual can undertake is often a factor of the interdependence of tasks and the freedom available to modify responsibilities (Wrzesniewski and Dutton, 2001). As such, the enactment of a role is influenced not only by an individual's goals but also the institutional context and ability to job craft. Future work will further explore how early-career EES make meaning in their positions based on their goals, desires, and intended impacts, which will help identify the way in which EES craft their roles differently than how their position is described.

References

Atman, C., Turns, J., & Yasuhara, K. (2021). Engineering Education Pioneers. Retrieved July 2, 2021, from http://bit.ly/engredupioneers.

Benson, L. C., Becker, K., Cooper, M.M., Griffin, O.H., & Smith, K. A. (2010). Engineering Education: Departments, Degrees and Directions. *International Journal of Engineering Education*, *26*(5), 1042-1048.

Berg, J.M., Dutton, J.E., & Wrzesniewski, A. (2008). What is Job Crafting and Why Does It Matter? Michigan Ross School of Business Center for Positive Organizational Scholarship. Retrieved June 20, 2021, from https://bit.ly/3hFq1n0

Borrego, M. (2006). *The higher education job market for M.S. and Ph.D. engineering education program graduates*. Paper presented at the American Society for Engineering Education Annual Conference, Chicago, IL.

Coso Strong, A., Smith-Orr, C., Bodnar, C., Lee, W., McCave, E. & Faber, C. (2021). Early Career Faculty Transitions: Negotiating Legitimacy and Seeking Support in Engineering Education. *Studies in Engineering Education*, *1*(1), 97-118.

Creswell, J. W., & Plano Clark, V. L. (2011). Designing and conducting mixed methods research (2nd ed.). SAGE Publications.

Froyd, J. E., Lohmann, J. R. (2014). Chronological and Ontological Development of Engineering Education as a Field of Scientific Inquiry. In A. Johri and B.M. Olds (Eds.), *Cambridge Handbook of Engineering Education Research* (pp. 3-26). New York, NY: Cambridge University Press.

Kaufman, L. & Rousseeuw, P.J. (2005). *Finding Groups in Data: An Introduction to Cluster Analysis*. John Wiley & Sons Inc.

Kuntz, A.M. (2012). Reconsidering the workplace: faculty perceptions of their work and working environments. *Studies in Higher Education*, *37*(7), 769-782.

Maechler M., Rousseeuw, P., Struyf, A., Hubert, M., Hornik, K. (2021). Cluster Analysis Basics and Extensions. R package version 2.1.2 — For new features, see the 'Changelog' file (in the package source), https://CRAN.R-project.org/package=cluster.

McCave, E., Bodnar, C.A., Smith-Orr, C.S., Coso Strong, A., Lee, W.C., Faber, C.J. (2020). *I Graduated, Now What? An Overview of the Academic Engineering Education Research Job Field and Search Process*. Paper presented at the American Society for Engineering Education Annual Conference, Virtual.

Reybold, L.E., Alamia, J.J. (2008). Academic Transitions in Education: A Developmental Perspective of Women Faculty Experiences. *Journal of Career Development*, *35*(2), 107-128.

Smith-Orr, C.S., Bodnar, C.A., Lee, W.C., Faber, C.J., Coso Strong, A., McCave, E. (2019). Collaborative Research: Supporting Agency among Early Career Engineering Education Faculty in Diverse Institutional Contexts: Developing a Framework for Faculty Agency. Paper presented at the American Society for Engineering Education Annual Conference, Tampa, Fl.

Walther J., Sochacka N., Kellam N.N. (2013). Quality in Interpretive Engineering Education Research: Reflections on an Example Study. *Journal of Engineering Education*, *102*, 626-659. https://doi.org/10.1002/jee.20029

Wrzesniewski, A., & Dutton, J.E. (2001). Crafting a Job: Revisioning Employees as Active Crafters of their Work. *Academy of Management Review*, *26*(2), 179-201.

Acknowledgements

Copyright statement