Illuminating Staff Collaborations in Student Professional Development

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Abstract—**This article represents a Full Paper. Students are often the beneficiaries of staff-led and managed programs where they acquire and hone professional development skills outside the classroom. Given the ongoing transformation toward a "whole new engineer" [1], we decided to focus on university staff and their involvement in improving student outcomes. The three teams profiled in this article were part of a larger set of 12 grassroots teams at a large, public U.S. university. We examine these three successful teams, all staff-led, two with six members and one with eight members. We were interested in how team members conceptualized their individual roles and their professional networks in helping their teams accomplish their goals. The data, illustrated through their statements and drawings, enable us to capture and explain their insider perspectives on these collaborations, the strategies they employed to overcome issues, the value they placed on divergent team-member views, and the factors they believed to be essential for success.**

Keywords—university staff, grassroots teams, cultural models, ethnographic approach, drawings.

I. INTRODUCTION

Many changes affect engineering students while they are at university – in particular, co-curricular activities. Examples include internships, co-operative education experiences (co-ops), tutoring, undergraduate research, workshops, and other educational programs [2], [3], [4]. Students are often the beneficiaries of workshops and programs where they acquire and hone professional development skills. They perceive that co-curricular activities represent important learning, complement coursework, enhance social skills, and assist in career and workplace preparation [5], [6]. Given the ongoing transformation toward a "whole new engineer" [1], a closer look at how these co-curriculars evolve seemed warranted.

Our study of 12 grassroots problem-solving teams emphasized the design and implementation of initiatives to enhance student outcomes. Our research group and selected ES faculty and staff actively recruited grassroots-team participants from among the pool of ES faculty and staff; a

few ES bachelor students were also sought. Team focus was based on recommendations from our earlier studies, with faculty and staff selecting a particular team based on individual interests [7]. All teams sought effective solutions to benefit students.

We found that only the initiatives of the three staff-led teams were successfully institutionalized, that is, fully integrated into university policies and practices. The other nine initiatives were led by faculty. While two of the nine were piloted successfully, they were not institutionalized because they constituted short-term, experimental pedagogical innovations [7]. Our most recent study offered insights into the internal dynamics of the three teams that are the subject of this article [8]. Here, we focus on the relationship between these three grassroots teams and their university networks to understand team-member contributions in fostering change within university culture.

II. LITERATURE REVIEW

A. Cultural Models

Cultural-models theory involves a shared view or experience with culture [9]. It can be defined as an integrated understanding of, or perspectives on, a particular culture [10]. Researchers elicit study-participant perceptions of key cultural elements. A virtue of cultural models lies in its ability to capture "emic"—or insider—views as expressed by cultural members. As such, discourse plays a prominent role in uncovering "sharedness" of experiences, knowledge, and values [11]. Researchers compile a consensus view of the culture which can then be validated with new interview data or data from other methods (e.g., surveys, participant observation).

B. Drawings to Enhance and Extend Cultural Models

We take another step in the cultural-models journey. Not only did we seek the views of our sample, but we also requested their conceptualizations through individual drawings. Behavioral scientists have used drawings—for example, to understand children's reactions to stress and trauma [12]. By

contrast, social scientists have relied largely on photographs to document their fieldwork [13] or, in some cases, have integrated their own sketches into their fieldnotes to assist with such tasks as recall and documentation of emerging patterns [14], [15]. Few have considered adult study participants as a potential source of drawings, though Johnson and her colleagues [16, p. 169] tried—only to discover that adults were unwilling because the "activity was considered 'childlike.'"

We explore grassroots-team-member perspectives and behavior related to their professional networks. We wondered how these three teams were able to institutionalize their initiatives successfully. Our key research question is: What do team cultural models reveal about team professional networks, application of those networks to team goals, and team ability to enhance its performance?

III. DATA AND METHODS

The research on which we report is part of a five-year study on organizational-culture change in an Engineering School (ES) at a large, public university in the U.S. Midwest. Our ethnographic approach has involved a mix of methods (i.e., interviews, focus groups, documents, surveys, observation) [17], [18]. Here we examine interviewee responses and drawings about grassroots-team performance in the three teams which appealed primarily to staff. We changed all the names in the text and on the drawings to protect confidentiality; all interviewees provided informed consent.

Sixteen of the interviews occurred with staff, two with faculty, and two with bachelor students. We conducted the 20 interviews by phone in 2020, which lasted 21 minutes on average. Table 1 shows that interview duration is higher for the Intercultural Competency team—largely because we did not have a clear understanding of its work prior to these interviews. Towards the end of each interview, we asked interviewees to complete a drawing. Consequently, the interviews yielded a total of 20 drawings, one from each interviewee.

	Flex Co-Op	Mentorship	Intercultural Competency	Total
Number of Interviews	8	6	6	20
Average Duration (in minutes)	18.9	17.8	25.5	
Number of Drawings	8	6	6	20

Table 1: Data Collection Attributes by Grassroots Team

Our protocol took the form of a describe-draw-explain sequence. We asked interviewees to describe their connections external to their team (i.e., faculty, staff, students and employers) which had the potential to be helpful to them in accomplishing their team's goals. Next, we asked for a drawing of how their team was able to be successful given these connections. Finally, we solicited their explanations of what they had drawn.

Two members of our research group independently coded the responses using content analysis to identify emerging cultural themes and patterns [19], [20]. We coded each team separately to capture a holistic understanding of its activities. We also separated the drawings by team, exploring the visual images of the connections that each team activated. Then we conducted a visual analysis of each team's drawings, taking note of their structure and any abstract symbols (e.g., arrows). Next we compared the paired drawings with the interview descriptions. When both of us completed our analyses, we shared our assessments and reconciled any differences.

IV. BACKGROUND

The three staff-led teams originated from a common source – an Experiential Learning Strategic Planning Session organized in Summer 2017. The Flex Co-Op team was convened to address a severe reduction in the completion of ES' Co-Operative Education Program in which students rotated between three (or five) semester-long terms of study, followed by terms working in one particular firm. Students had voiced concerns about wanting the opportunity to work for more than one employer. The Mentorship team was formed to offer bachelor students an opportunity to be mentored by ES alumni. The Intercultural Competency team was initiated to assist an ES lecturer in integrating intercultural learning into certain ES bachelor courses.

Table 2 identifies selected team characteristics of the three teams. Directly related to the purpose of each team was the initial team framing question. These questions provided a focus for the teams' activities and efforts. Flex Co-op was the most diverse team with staff, faculty, students, and employer representatives while Mentorship had staff and students, and Intercultural Competency only staff. The number of team members in attendance at meetings varied; generally, Flex-Co-Op and Mentorship had at least twice as many members as Intercultural Competency at any given meeting.

	Initial Team Framing Question	Team Duration	Average Number of Participants at Meetings
Flex Co-Op	How could university Co-Op Programs be more flexible and higher impact for students?	2017-2019	9
Mentorship	How could ES leverage its extensive, extremely successful alumni network to grow, develop, and mentor current ES bachelor students?	2017-2018	7
Intercultural Competency	What would it look like if ES students possessed exemplary intercultural competencies by graduation?	2017-present	3

Table 2: Selected Team Characteristics (Fall 2017)

We now present our analysis and results. We identify prominent themes related to the work of each of the teams as they accessed colleagues in their professional networks to

help achieve their team goals. The teams varied in their approach to problem-solving.

V. FLEX CO-OP TEAM RESULTS

A. Outreach and Information Gathering

Co-Op programs allow students to rotate terms (i.e., semesters) of study with terms of employment. In the program's original form, ES students worked for the same employer three (or five) different semesters. The Flex Co-Op team was a response to student interest in working at more than one company as well as the plummeting five-term completion rate. Team members engaged in robust forms of outreach to disseminate the team's goal and update key stakeholder groups (e.g., employers, students) and others about its work. For example, a staff member indicated that the team connected with "employers, especially some of the bigger Co-Op employers, because we didn't want to lose their business, so to speak, by offering something that they didn't want." Team members functioned as an information chain. The student we interviewed reported, "Carl and I would bring to the table, 'Here's what the (Professional Experience Representatives are) doing right now and here are some student testimonials.'" Figure 1 illustrates team-member outreach which captured external input from various stakeholder groups and later disseminated information back to these groups.
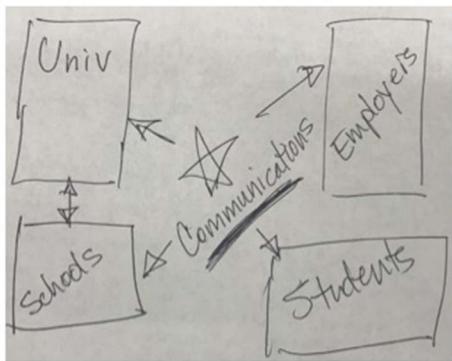

Figure 1: Dissemination of Flex Co-Op Initiative to Stakeholder Groups

B. Managing Resistance

Some team members did not see the value of Flex Co-Op at the outset: "We invited the participants we knew had these differing opinions and initially it was like the hard line stance on those." To cope, one team member noted, "We looked at everything. And I think it helps that there's a bunch of engineers in the group. They're all very evidence-based, so they're looking at the evidence and saying, 'Okay, given this new information, we need to make these changes.'" Eventually, all team members who initially resisted Flex Co-Op, "were confident enough to go back to their (organization) and run this idea past them. They, ultimately, were successful in getting their (organization's) buy-in." Team members engaged with employers, allowing them to absorb the proposed changes and consider the benefits. Developing and

institutionalizing Flex Co-Op was an "evolution." "People didn't buy in all at one time. People didn't say, 'Oh yeah, that's it!'" Reaching agreement took the team significant time and effort.

Figure 2 shows a platform on a pivot with the Flex Co-Op team on top "coordinating and creating balance on a precarious platform" while the various stakeholders "brace and support it and stabilize it." Ultimately the team piloted Flex Co-Op in Spring 2018. Students only needed to commit to two terms with the same firm and could then seek work with an alternate employer. Flex Co-Op was fully institutionalized in Spring 2019.

Figure 2: Finding Balance among the Stakeholders

VI. MENTORSHIP TEAM RESULTS

A. Stakeholder Focus

Convening the Mentorship team was a response to an unsuccessful mentorship program involving ES students and faculty members. The intent of the new program was to recruit mentors and mentees from the alumni and student populations. One team member remarked, "Right directly on the team, (team members) … reached back into their own world, own organization" (e.g., ES honor society). Figure 3 illustrates the team-leader's conceptualization of these two external audiences in relation to the "core team."
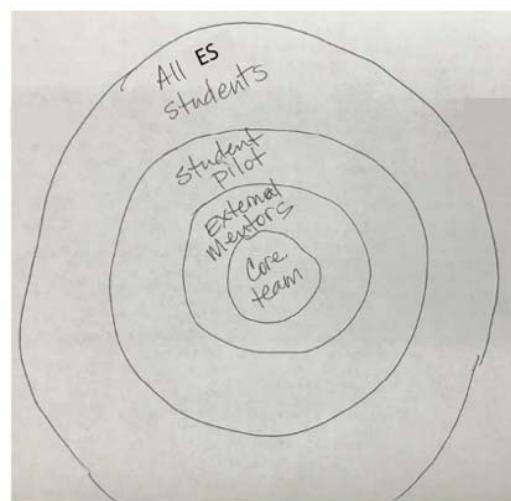

Figure 3: Capturing the Mentorship Stakeholders

B. Ongoing Strategizing

Team members began cultivating their connections with those that might serve as brokers—such as individuals and university units connected with industry. One team member commented, "We leverage a lot of connections that Janice (team leader) has, and we use our Industry Partners to kind of identify those alumni that are already giving back and engaged with ES." A second commented, "It's been industry contacts that have also served as alumni mentors." Likewise, ES' Advancement (i.e., philanthropic) contact was helpful, as were ES honor society members who played a critical brokering role. A staff member explained,

> The students (on Mentorship) were representing the student population and they were going back and talking with their organization … trying to just get opinions, broader opinions. And I think they helped us do a survey as well with some students to try to get some data around what students were looking for.

The student team member that we interviewed helped coordinate and run an event for mentors and mentees which his drawing depicts (See Figure 4). It shows "the first winning egg (which) had a parachute attached to it" as it descended from the second to the first floor in an atrium-like area of the building.

"So, the big thing was we did an egg drop…It's a game where you have five pieces of paper and a yard of tape and you have to build something where if you drop an egg off a ledge, you'll survive the fall. So, that was … a fun little engineering challenge to get people working together … We put them in plastic bags, so if they did break, which they usually did, they wouldn't go everywhere."

Figure 4: Egg Drop Game at a Mentoring Event

C. Persisting in the Face of Challenges

Perhaps the biggest challenge faced by the Mentorship team involved technology to facilitate matchmaking for mentor-mentee pairs. The team tried and failed more than once. As the technical issues multiplied, accompanied by some team turnover, the team requested a new ES staff position to manage both Alumni and Peer Mentorship. The staff member was hired in fall 2018. Two early decisions were made: 1) moving to a different platform for the Peer Mentoring matching process and 2) mat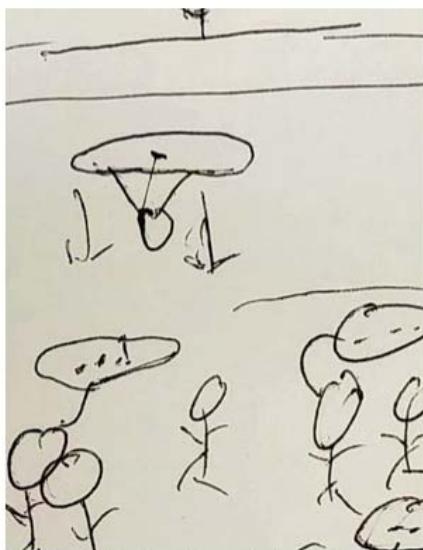ching the student-alumni pairs by hand. Mentorship continues today but no longer operates as a team. Two of the original team members and a rotating set of students serve in an advisory capacity to the new staff member, offering both historical insights and emerging concerns of mentors and mentees.

VII. INTERCULTURAL COMPETENCY TEAM RESULTS

This team was organized when an ES lecturer, with the support of the ES Head, wanted to incorporate intercultural learning exercises into some of the lecturer's courses, and later all ES bachelor courses. The lecturer began by seeking advice from one campus unit and subsequently tapped staff in other university organizations whose job functions related to intercultural learning. Several intercultural learning initiatives had been ongoing across campus for years, with the key players known to and often working with each other.

A. Drawings Reveal Distinctive Networks, Not a Team

This team was different from Flex Co-Op and Mentorship. We noticed the lack of team-specific details in the drawings and in interviewee explanations of them. Five of the six drawings made no reference to the team. Figure 5 shows entities that are part of one team member's (James) own professional network. Other drawings depicted a team member's connections to his job, and the team connected to campus organizations—none with Intercultural Competency team identifiers.
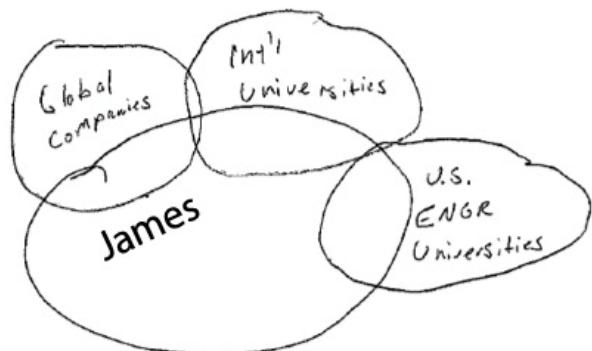

Figure 5: One Team Member's Professional Connections

The only drawing that was team-specific was done by the team leader (Marc), the person who brought together all the intercultural-learning specialists to assist him with his series of tasks (Figure 6). This network shows ES with the Head of the School (at the top) linked

Figure 6: ES Network Activation Attempts

to his team (in the center), and connections from both the Head and the team to others within ES. For example, Marc stressed, "It wouldn't be just our group that would be reaching out, but then also we're able to use the other influence (of the Head) to move forward."

Role diversity within the team was limited in the selection process. The team had no faculty or student participants. While the team leader was able to access and interact with both groups given his ES lecturer position, the team as a whole did not benefit from the direct influence of faculty or students. Moreover, the team had no other ES representation. There was also an "ownership" issue. As interviewee drawings and statements attest, embedding intercultural learning into ES courses was the responsibility of the team leader. Even though the team was willing (perhaps even eager) to assist, it never self-identified as a collective—as a group of stakeholders working together to accomplish the same overarching vision. Instead, the individual team members offered their input into various team-leader tasks over time.

B. Reliance on Workarounds

In spite of all the challenges, intercultural learning has wended its way into ES. Many ES courses now incorporate exercises and examples of cultural differences and assess 2nd- and 4th-year bachelor student intercultural-competency abilities. Unlike Flex Co-Op and Mentorship, the Intercultural Competency team did not mention that its internal dynamics propelled it forward or enabled it to persevere. Instead, its members continued their multi-pronged approach across their own individual networks to improve the acceptance and use of intercultural content *generally* across the university. They employed several strategies:

- *PhD staff discuss intercultural content with their students and in their courses:* "Even though I'm not technically faculty, I function as faculty. I have PhD students. I teach courses and those kinds of things. So, there's that avenue to credibility (with faculty)."

- *Staff attempt to work with instructors:* "Is there something in one of those (ES courses) that verbal, nonverbal communication makes sense with (sic) or that maybe self-awareness really helps with? We try to find ways to meet them where they (instructors) already are."

- *Staff try to "remove as many barriers as possible":* "Professors will be able to just take these plug-and-play modules and just plop them into their courses. They don't have to teach it. They can just assign it to their students and it's auto play."

- *Staff seek senior administrator backing:* "We've been trying to do things like not only get the buy-in from the top levels, and then (sic) have that support moving down the ranks."

While some evidence suggests that such strategies are working, they need to be considered within a broader context. In parallel, university administrators have been raising the visibility of intercultural learning: "the funding comes down from the dean and he gets it from the president." New professionals have been hired to embed "intercultural learning and assessment into the curriculum," among other tasks. Given the availability of such resources, the impact over time has the potential to be substantial. The lecturer's success, along with the successes of his intercultural-learning colleagues, are an easily-understood byproduct of this university-wide effort.

VIII. DISCUSSION

A. Team Structure

Structure, the "arrangement of relationships created to accomplish…[the] work," involves a division of labor by role, status hierarchy, and resources [21, p. 9]. Among the three teams, Flex Co-Op and Mentorship were the most similar to each other. Their cultural models (evident in study-participant perspectives and drawings) identify key structural elements. For example, they tapped into their *individual professional networks*, bringing in expertise, ideas, and advice from their contacts—information that was exchanged, debated, and acted upon. *Holism* appeared in the selection of diverse team members who represented differences in university role, which sometimes led to divergent viewpoints. Their cultural models referenced numerous stakeholders and broker organizations which reflected a broad, and reasonably comprehensive, set of entities. The powerful *role of team leader* appeared in the team vision and management of the process. Both teams encountered challenges, though the multiplicity of setbacks hit Mentorship particularly hard. The team leader's role in these two initiatives involved "just driving the process forward," adapting to the turnover, and leading the team decision-making process.

Intercultural Competency team members did not function as a team because they did not share a common goal. Consequently, they neither shared these structural characteristics nor a team-based cultural model. Instead, they functioned on an as-needed basis in an advisory capacity, not a decision-making role. Like all team members, they voluntarily offered their time and energy when asked by the team leader, the decision maker, for assistance.

B. Team Dynamics

Dynamics, defined as the "behavioral dimension of … activity," entails team processes, practices, strategies, perceptions and symbolism [21, p. 8]. Flex Co-Op and Mentorship teams also shared similar dynamic features. *Collaboration* emerged as the usual working mode, requiring team members to listen carefully to what their contacts said and represent that input accurately and completely to their teams. The majority of drawings illustrate the teams connected to and working with others. *Tenacity* appeared in the significant time and effort put into these initiatives. In Flex Co-Op, team members carefully considered the options and eventually reached consensus—a process that was sometimes tense and difficult. In Mentorship, every time team members dealt with a setback, they faced some new obstacle. Yet, the team leader and a few others persevered; in that sense, each new challenge was met with determination.

We found no prominent themes and no shared cultural model pertaining to interactions involving the Intercultural Competency team. Even though this team supported its team leader, implementation was assumed to be the team leader's task. And, the team leader perceived that he held little power to embed intercultural learning into ES courses that he was not teaching. Thus, to achieve the team-leader's goal required an intervention by a higher-ranking leader (i.e., ES administrator) which ultimately occurred and was successful.

C. Teams as University Change Agents

Grassroots teams offered a unique opportunity to improve long-term organizational issues affecting student outcomes. The creation of such teams is a strategy worth implementing. All three teams confronted change head-on and were successful in institutionalizing their initiatives. They were able to address aspects of university functioning that were less-than-optimal and innovate by accessing their networks and pooling their knowledge and expertise to arrive at a "better way." By and large, staff have carved out areas in student education and learning in which they have had notable influence. Yet, most literature we found does not emphasize this important role [2, 5, 6]. Given that 80 percent of our team members were staff, we now have a better understanding of how staff work together effectively as part of a team culture.

IX. CONCLUSION

Our research question focused on what team cultural models (both discourse and drawings) reveal about team professional networks, application of those networks to team goals, and team ability to enhance its performance. First, we found that the structure of staff-led teams in university culture signaled the development of highly-interconnected professional networks. Information and actions were negotiated among team members to achieve team goals targeting improved student outcomes. The connections and negotiation of ideas also revealed a holistic process coalescing the perspectives of individuals that represented diverse university units. Second, we noted the significance of collaboration among team members in spite of their differing perspectives. The teams exhibited tenacity even during setbacks thanks to the steady hand of effective team leadership. Third, when network strategies and collaboration were combined, these grassroots teams were situated in a unique position to implement long-term solutions that would enhance student professional development.

As a society moving rapidly in the direction of global interconnection, engineering students need to be prepared to adapt to change as they build careers in industry, business, government, and elsewhere. Staff's crucial role in readying students for the job market is increasingly visible and noteworthy within the context of pedagogical and co-curricular changes sought by accreditation agencies and industry representatives. Since value is often defined or re-defined by outside forces, such pressure is likely to have a positive effect on raising the status of staff engaged in student workforce preparation.

REFERENCES

[1] D.E. Goldberg and M. Sommerville, A Whole New Engineer: The Coming Revolution in Engineering Education. Douglas, MI: ThreeJoy Associates, Inc., 2014.

[2] C.J. Finelli, M.A. Holsapple, E. Ra, R.M. Bielby, B.A. Burt, D.D. Carpenter, T.S. Harding, and J.A. Sutkus, "An assessment of engineering students' curricular and co-curricular experiences and their ethical development," Journal of Engineering Education, vol. 101, no. 3, pp. 469-494, July 2012.

[3] C.J. Finelli, S.R. Daly, and K.M. Richardson, "Bridging the research-to-practice gap: Designing an institutional change plan using local evidence," Journal of Engineering Education, vol. 103, no. 2, pp. 331-361, April 2014.

[4] E.E. Stiwine and T. Jungert, "Engineering students' experiences of transition from study to work," Journal of Education and Work, vol. 23, no. 5, pp. 417-437, November 2010.

[5] S. Kovalchuk, M. Ghali, M. Klassen, D. Reeve, and R. Sacks, "Transitioning from university to employment in engineering: The role of curricular and co-curricular activities," American Society for Engineering Education, Paper ID# 18625, 2017.

[6] T. Martini, R. Verbey-Verutis, J. Grose, B. Clarke, and A. Elder, "Canadian undergraduates' reports of co-curricular involvement across the degree," Teaching & Learning Inquiry, vol. 7, no. 1, pp. 103-119, 2019, http://dx.doi.org/10.20343/teachlearninqu.7.1.7

[7] F.R. Rodríguez-Mejía, E.K. Briody, R. Rothstein, and E.J. Berger, "Implementing grassroots initiatives of change: The combined perspectives from psychology and anthropology in an engineering school," International Journal of Engineering Education, vol. 36, no. 3, pp. 1097-1116, 2020.

[8] E.K. Briody, F.R. Rodríguez-Mejía, J. King, and E.J. Berger, "Understanding culture through pictures and a thousand words," unpublished.

[9] N. Ross, Culture and cognition: Implications for theory and method. Thousand Oaks, CA: SAGE Publications, 2004.

[10] M. Paolisso, P. Weeks, and J. Packard, "A Cultural Model of Farmer Land Conservation," Human Organization, vol. 71, no. 1, pp. 12-22, 2013.

[11] C. Strauss and N. Quinn. A Cognitive Theory of Cultural Meaning. Cambridge, UK: Cambridge University Press, 1997.

[12] S. Jabbar and A. Betawi, "Children express: War and peace themes in the drawings of Iraqi refugee children in Jordan," International Journal of Adolescence and Youth, vol. 24, no. 1, pp. 1-18, 2019.

[13] M. Soukup, "Photography and drawing in anthropology," Slovak Ethnology (Slovenský Národopis), vol. 62, no. 4, pp. 534-546, 2014.

[14] K. Kuschnir, "Ethnographic drawing: Eleven benefits of using a sketchbook for fieldwork," Visual Ethnography, vol. 5, no. 1, pp. 103-134, 2016.

[15] M. Taussig, I Swear I Saw This: Drawings in Fieldwork Notebooks, Namely My Own. Chicago, IL: University of Chicago Press, 2011.

[16] G.A. Johnson, A.E. Pfister, and C. Vindrola-Pardos, "Drawings, photos, and performances: Using visual methods with children," Visual Anthropology Review, vol. 28, no. 2, pp. 164-178, 2012.

[17] D.M. Fetterman, Ethnography Step-by-Step, 4th ed., Applied Social Research Method Series, Vol. 17, Thousand Oaks, CA: SAGE Publications, Inc., 2020.

[18] M.D. LeCompte and J.J. Schensul, Designing and Conducting Ethnographic Research: An Introduction. Ethnographer's Toolkit Book 1, 2nd ed., Lanham, MD: AltaMira Press, 2010.

[19] H.R. Bernard, A. Wutich, and G.W. Ryan, Analyzing Qualitative Data: Systematic Approaches. 2nd ed., Los Angeles, CA: SAGE Publications, Inc., 2017.

[20] M.D. LeCompte and J.J. Schensul, Analysis and Interpretation of Ethnographic Data: A Mixed Methods Approach. Ethnographer's Toolkit Book 5, 2nd ed., Lanham, MD: AltaMira Press, 2013.

[21] E.K. Briody and R.T. Trotter, II, "Framing the Partnership Experience," in Partnering for Organizational Performance: Collaboration and Culture in the Global Marketplace, E.K. Briody and R.T. Trotter, II, Eds. Lanham, MD: Rowman & Littlefield, 2008, pp.3-14.