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Tracing the Growth of a Community of Practice Centered on Holistic Project-Based Learning in Communication at an Engineering University in the United Arab Emirates: Insights From a Socially-Situated Teacher Cognition Perspective

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Key words: project-based learning; language teacher cognition; cultural-historical activity theory; qualitative case study; undergraduate engineers; communication courses; Middle East

Abstract: A holistic project-based learning approach can be used to support the development of teamwork, critical thinking, communication and research skills in undergraduate engineers in international contexts where English is a lingua franca. However, in many contexts, this approach might remain an under-exploited option. Our qualitative case study focused on one community of practice within the communication department of an engineering university in the Middle East that appears to have embraced project-based learning. Drawing on cultural-historical activity theory, we concentrated on gaining a deeper understanding of how this community of practice has developed and been sustained. From a socially-situated language teacher cognition research perspective, we analyzed experiences, beliefs and practices of communication department faculty regarding project-based learning. Our rich, descriptive account may be of interest to academics interested in encouraging project-based learning elsewhere.

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1. Introduction

It is widely accepted that engineers being trained to work in today's global economy, in which English tends to be the lingua franca, "must be able to apply their technical knowledge in team-based environments where flexibility, communication, and cooperation are needed to solve problems that do not necessarily have well-defined technical boundaries" (PASHA-ZAIDI, 2015, p.1). This understanding carries implications for the teaching of English for specific purposes (ESP), a field in which advances in recent decades (DALTON, 2008) have mirrored those in second language acquisition (SLA) research more

generally (NUNN & HASSAN, 2015). This SLA literature highlights important principles that might inform pedagogical practice in ESP, e.g., the need to focus predominantly on meaning while encouraging interaction and creating conditions for implicit linguistic knowledge to develop (ELLIS, 2005); these principles seem relevant to the development of academic literacy on undergraduate courses for future engineers (NUNN, BRANDT & DEVECI, 2016). [1]

One way of incorporating such principles into the curriculum is to take a holistic approach to learning and teaching, i.e., one nurturing a sense of "wholeness" in enquiring minds, encouraging negotiation and facilitating learning through dialogue (NUNN, 2006a), so that students and teachers are constantly able to "make choices about techniques and methods appropriate to evolving situations" (NUNN et al., 2016, p.12). Such a framework might be realized through inter-related methods that have been variously described (in the very context in which the research took place) as project-based learning (NUNN & THURMAN, 2010), inquiry-guided learning (CRAIG & BIELENBERG, 2015), inquiry-based learning (BRANDT, 2012), context-based learning (HATAKKA, 2008) and problem-based learning (DEVECI, 2013). Some of these terms have been differentiated in various ways, e.g., by GRANT (2011), who suggests that problem-based learning is centered more on the acquisition of new knowledge in contrast to project-based learning, which is centered more on the creation of an artifact. In GRANT's view, however, both together offer an instructional method that "affords authentic learning tasks grounded in the personal interests of learners" (p.38). Meanwhile, DEIGNAN (2009) subsumes the term problem-based learning under the umbrella term inquiry-based learning, with which it "shares the same philosophical orientations and educational intentions" (p.13), e.g., in engaging learners in selecting lines of inquiry and choosing their research methods in the belief that this activity will help empower them. [2]

From the local literature ('local' in the sense of emanating from the university where the research was conducted), the holistic approach to learning and teaching adopted on undergraduate communication courses seems valued, both by teachers and students. From the perspective of the first of these groups, CRAIG and BIELENBERG (2015, p.2) argue, for example, that an approach centered on inquiry-guided learning can result in learners beneficially experiencing "an increased appreciation for lifelong learning, enhanced higher order thinking, teamwork, and communication skills, higher self-confidence, and greater problem solving abilities." Learners investigated have also identified benefits of an education based on such an approach. PASHA-ZAIDI (2015), for example, surveyed 51 seniors on their professional skills' development earlier at the university; they had taken undergraduate communication courses three years earlier in their (first) freshman year. The majority reported feeling they had been "adequately" or "highly" prepared in virtually all soft skills areas, with "teamwork" and "written communication" (p.4) scoring particularly highly. Likewise, the benefits of teamwork were noted in DEVECI's (2013) year-long investigation of the reported learning styles of 62 freshmen taking communication courses, which found that collaborative learning styles developed over the year. [3]

There is also evidence in this research context, from observations of teachers of communication courses and semi-structured interviews conducted with them, of practices and cognitions broadly aligned with a "holistic project-based learning" approach (NUNN et al., 2016, p.10). Within this approach, "the skills and knowledge that contribute to academic competence" (p.9) are developed through principled behavior; such teacher behavior can include, for example, providing "opportunities for self-regulation through which learners develop their argumentation skills" while also ensuring that these "learners have opportunities to explain their ideas and research choices" (p.13). Exemplification of this approach in practice can be found in NUNN and HASSAN's (2015) study of how a teacher supported the development of critical reasoning in her students in class; this study includes lesson descriptions and reflections clearly consistent with this approach. Likewise, three teachers within the department interviewed by HATAKKA (2008, p.179) offered "a clear idea of context-based teaching" (HATAKKA's umbrella term that covers project-based and problem-based methodology); they had reportedly "adopted a holistic, integrated skills approach" (ibid.). These teachers seemed to believe that they should act as facilitators, incorporate varied approaches, provide realistic contexts for learning, get to really know their students, encourage students to communicate orally and in writing, emphasize "the use of correct language by teaching vocabulary and grammar points as they are necessary for particular tasks or as they occur in [linguistic] input or students' work," and teach reading and critical thinking skills; they should also give feedback and evaluate student work according to principled criteria, and collaborate with other teachers (p.174). Elaborating on these points, HATAKKA explains that the instruction may commence with the teacher perhaps "frontloading information, but, as the students progress, they are encouraged to become more independent, and the instructor assumes the role of a facilitator" (ibid.). HATAKKA's view is that the research context is one characterized by contextually-sensitive teacher expertise (TSUI, 2003). From her account there emerges an image of a distinctive "community of practice" (WENGER, 1998, p.11), a notion which implies collective learning and shared goals, in an environment in which faculty seem committed to a holistic approach to developing academic literacy. [4]

The case study presented here is set within the same Middle Eastern university context. Drawing on cultural-historical activity theory (CHAT) (ENGESTRÖM, 2001), which is centered on the notion that "cultures influence the way we think about the world" (ROTH, RADFORD & LaCROIX, 2012, §9), we aimed to explore the cognitions, i.e., thoughts, knowledge, feelings, and beliefs, together with related classroom practices (WYATT & BORG, 2011), of communication faculty regarding project-based learning more exhaustively. Research with such a focus appears to be needed. This is because, notwithstanding an apparent real world need for holistic project-based learning (NUNN et al., 2016) to develop the skills needed by undergraduate engineers (PASHA-ZAIDI, 2015), it is clear that many engineering universities around the world do not necessarily deliver the kind of curriculum their students require (LAPPALAINEN, 2009); such a scenario can be frustrating for the academics they employ (BRANDT, 2012). Those university contexts that do appear to be providing holistic project-based learning therefore

need to be better understood; this insight suggests the need to explore how the communities of practice (WENGER, 1998) within these universities have developed and been sustained by the academics in question and why. This in itself implies a further need to conduct investigations shaped by the sociocultural and sociohistorical traditions in language teacher cognition research (BURNS, FREEMAN & EDWARDS, 2015). In such research, which is frequently diachronic, language teacher cognitions are conceptualized as shifting and socially situated, shaped by the instructional contexts in which teachers work. However, as the same authors report, compared to those focused primarily on individuals, teacher cognition studies that are sociocultural and sociohistorical in nature are still comparatively rare. This situation remains the case in university contexts such as ours. In the following sections, we describe our university context (Section 2), outline the research methodology we employed (Section 3), and then present and discuss results (Sections 4 and 5). [5]

2. Research Context

The university was established in 2001 in an oil-producing Middle Eastern country with the goal of becoming a world-class institution focused on providing engineering education and energy industry research. Ranked Number 20 in 2015 for the "Middle East and North Africa" region in the Times Higher Education World University Rankings (and, as of 2018, after merger with another university, Number 2 in the Arab World), it offers four-year undergraduate and two-year Masters' degrees in branches of engineering (chemical, electrical, mechanical and petroleum) and petroleum geosciences; as of 2016/17, when the primary data for this research were collected, the university had also recently started enrolling PhD students in the same areas of science and engineering. Communication courses are provided in the freshman year of the four-year undergraduate degree. To reach this stage, the students have already demonstrated competence in English (measured by an overall score in the International English Language Testing System [IELTS] of 6[1]), as well as in chemistry, mathematics and physics (through successful completion of a foundation course), but are yet to engage with the specialist content of their majors. In the freshman year, besides communication, they take courses in the humanities and social sciences as well as a general engineering course, and further mathematics and science. [6]

The two communication courses which are focused, according to the university website in 2017, on producing well-rounded, autonomous life-long learners who are able to use higher order thinking and communication skills, are both one semester long. The first concentrates on supporting critical reading, critical writing and oral presentation skills through a context of humanities and social science

1 According to its website, "the International English Language Testing System (IELTS) measures the language proficiency of people who want to study or work where English is used as a language of communication. It uses a nine-band scale to clearly identify levels of proficiency, from non-user (band score 1) through expert (band score 9)" (https://www.ielts.org/what-is-ielts/ielts-introduction [Accessed: February 24, 2019]). An overall score of 6 is used as a benchmark for admission to undergraduate study at many of the universities around the world where English is a primary language of instruction.

research projects; the course also aims to raise student awareness of quality time management, teamwork, referencing and planning skills. The second course, described in detail by DEVECI and NUNN (2018), builds on this focus, further refining skills development. The students undertake, in groups of usually 3-4 persons, a "real-world" academic, educational or technical project. Outputs include extensive team-written project reports and multimedia research presentations. The students meet for four hours per week, in seminar groups containing 15-20 persons, in well-resourced classrooms. Besides facilitative guidance in class, they can gain tutorial support for communication skills outside class in teachers' office hours and from a writing center; this writing center employs peer tutors and concentrates on providing scaffolding help (BRANDT & DIMMITT, 2015). [7]

While the cognitions of communication faculty are the focus here, it is worth remembering that the English language learning that undergraduate engineers of different nationalities at the university would have experienced prior to their first-year communication courses would have been very varied, these experiences likely reflecting diverse secondary school education in a range of contexts, including parts of South Asia and North Africa as well as the Middle East, provided by teachers holding very different beliefs about language learning and the development of communication skills. For example, while there is evidence of communicative language teaching starting to take root in the Arabian Gulf (WYATT, 2009; WYATT & BORG, 2011), it has also been argued that the grammar translation approach to English language teaching is still alive in secondary education in the Arab world, realized through a classroom focus on the "comprehension of discrete rules and production of correct forms rather than communication or meaningful language" (ASSALAHI, 2013, p.596). However, when students move from secondary to tertiary education in the Gulf, they might encounter teachers more familiar with task-based learning or "post-method pedagogy" (KUMARAVADIVELU, 1994, p.30), which is an approach where practitioners can develop locally-situated, context-sensitive innovative practices rather than depend on imported methods that may be inappropriate to their learners. The likely greater exposure of students to task-based learning and post-method pedagogy at university level is due to the generally positive stance towards these approaches taken by many educators working in university contexts in East and West Asia and disseminating their work at international conferences in the region, as evident, for example, in a special conference-based issue of the *Asian EFL Journal* (NUNN, 2006b). Therefore, while the focus here is on an engineering university, it is likely that other types of university in the Gulf may also be offering more communicative or innovative curricula than those many of their first-year students joining directly from secondary school may be familiar with. [8]

3. Research Methodology

To gain an understanding of how a local community of practice which was focused on supporting project-based learning in communication courses for engineering students had developed within the university, and how faculty conceptualized their pedagogical approaches and realized project-based learning in their classroom practice, we drew on a socially-situated language teacher cognition research perspective (BURNS et al., 2015) to develop a qualitative case study (STAKE, 1995). In line with CHAT, our primary unit of analysis was a "collective, artifact-mediated and object-oriented activity system" (ENGESTRÖM, 2001, p.136); in our case, the collective was centered on communication faculty's cognitions in interacting with project-based learning to support learners' development. To unpick this further, as ROTH et al. (2012, §1) explain, CHAT provides a way of investigating "how humans purposefully transform natural and social reality, including themselves, as an ongoing culturally and historically situated, materially and socially mediated process." The process or activity in our research was the cognitive work of communication faculty concerning project-based learning and their enactment of this approach within a changing context that is continually mediating outcomes. Other key principles of CHAT, as outlined by ENGESTRÖM (2001), also informed our research design, in ways we will explain. The design needed to reflect the "multi-voicedness" of the activity system, incorporate "historicity," lay bare "contradictions as sources of change and development" and allow for the possibility of "transformations" in the activity system (pp.136f.). [9]

To achieve these goals we employed various qualitative methods in tandem. To access multiple voices, for example, we first developed open-ended survey questions for faculty, aiming to reach the whole department, with everyone invited to participate; considering history, these questions were tailored to different roles within the university and differing levels of experience (see the Appendix for an example). We were eliciting narratives from faculty, inviting them to construct, share, analyze and interpret their own stories (BARKHUIZEN, 2008). After initial analysis of their narratives, we conducted brief informal follow-up interviews where clarification was needed. To gain insights into transformations over time, we analyzed the published work of participating faculty for relevance to the research focus. Also considering the sociohistorical angle, we examined miscellaneous documents, e.g., a job advertisement for faculty published in the *Times Higher Education* Supplement in September 2005. [10]

Our research design was thus informed by CHAT principles (ENGESTRÖM, 2001). Through choice of methods, we also sought to achieve "triangulation" (STAKE, 1995, p.107), e.g., through comparing deeds with words. Another consideration was to select methods on pragmatic grounds. Though the open-ended survey method, for example, lacks the interactivity of face to face interviews, it was selected for convenience, both to participants (since they could reflect at leisure before replying) and researchers (since responses would in a sense come readily transcribed). Regular face-to-face contact within the department facilitated the asking of informal follow-up questions, where these

were needed, and the requesting of access to publications that were not online. (We screened over 150 publications produced by communication faculty since they had joined the department, reading those that seemed relevant to the focus of this research, and eventually citing 19.) [11]

Ten of the 15 faculty members of the department provided written responses to the survey questions, generating over 7,000 words of text. Another two promised to participate but did not, citing pressure of work, while another declined on the basis that answers, if quoted, might be self-identifying, even though anonymity had been assured; the other two did not respond. Ethical guidelines addressing the university's requirements were followed, with participants informed that their responses would be treated as confidential and would be anonymized (through expressions such "one colleague said ..."), unless they wished otherwise. In the event of participants preferring to have their words attributed to them, they were asked to indicate this willingness and were assured detailed member checking; this member checking would include the opportunity to review sections of a draft in which they had been quoted. [12]

All ten participants did confirm that real names could be used. After "member checking" (STAKE, 1995, p.116), they also all reported satisfaction with the way they had been quoted, thus providing a kind of validation of our attempts to represent their arguments reflexively (ROTH & BREUER, 2003). Using real names with permission seemed preferable, since the participants, like those for example quoted by GUENTHER (2009, p.414), "wanted to be heard"; eight of the ten have contributed to the 'local' literature on project-based learning referred to above and cited below. Using real names rather than pseudonyms had an additional advantage; cognitions elicited through the open-ended survey and follow-up interviews could be compared with those expressed in published work, facilitating "triangulation" (STAKE, 1995, p.107). [13]

A limitation we should acknowledge, however, is that the perspectives of faculty in favor of project-based learning are more likely to have been represented in this case study than any faculty with alternative perspectives. This scenario is due to the research design, with the identities of participants known to the first researcher (Mark WYATT) through the elicitation method. The impact of the "social desirability response bias" (COLLINS, SHATTELL & THOMAS, 2005, p.189) cannot be discounted, particularly given that my (the first researcher's) positive stance towards project-based learning was perhaps known by most if not all participants. This is "insider research" (HOLLIDAY, 2007, p.137), produced from my perspective of (at the time) a recently-recruited faculty member, with experience of conducting teacher cognition research in other contexts, e.g., through qualitative semi-structured interviews, but seeking to learn more about this particular community of practice. The second researcher (Roger NUNN), who is also committed to holistic approaches to research and education, and who, besides participating, has been acting as a sounding board throughout the research process, had eleven years' professorial experience in the same department at the time the research was conducted. Given our "insider" status, it was crucial that we were "reflexive" throughout (HOLLIDAY, 2007, p.138),

therefore able to "come to terms with and indeed capitalize on the complexities of [our] presence within the research setting" (ibid.). [14]

This self-reflexive stance informed every stage of the research, including our inductive analysis of the qualitative data, which proceeded through several stages; these included initial coding according to emergent themes, clustering and juxtaposing through use of a data matrix, before the sketching out of a narrative structure. The narrative created, featuring "thick description" (GEERTZ, 1973, p.310) to support vicarious understanding, aimed to help the data, juxtaposed with description and analytic commentary, star (CHENAIL, 1995). We now present results, organized around research questions that are informed by CHAT principles (ENGESTRÖM, 2001). [15]

4. Results

4.1 How did a community of practice centered on holistic project-based learning develop within the communication department?

4.1.1 Beginnings

As noted above, the university opened in 2001, and project-based learning was not initially on the menu. Indeed, Robert CRAIG[2], who became the head of what was still a very small communication department in 2003, reported:

> "I arrived in Fall 2002 to find a course entitled 'Freshman English', which required students to write 8 essays over the 17-week semester on a topic provided by the instructor and only briefly discussed; students were sent away to do 'research' and submit a draft a week later, and the final version, after feedback, by the end of the following week. Zero research skills training. I thought it was terrible, and saw little development in skills or language proficiency." [16]

CRAIG had recently been able to experiment with team and project-based learning at a university in Morocco. Now, in the United Arab Emirates (UAE), he was allowed to pilot an alternative communication course incorporating skills training, with some of the assignments using a "team-based approach." He was influenced, he says, by an ACCREDITATION BOARD FOR ENGINEERING AND TECHNOLOGY (2000) report that emphasized the importance of centering innovative teaching on the achievement of learning outcomes to produce graduates with skills employers need. He also conducted needs analyses with faculty involved in teaching the freshman and (second) sophomore years to ascertain the extent to which, in their eyes, communication skills were being developed, and when findings pointed to "a need for skills development in all areas," he felt this need would be best supported by a project-based approach. Colleagues supporting CRAIG's initiative included David DALTON and Mary

2 Robert CRAIG, together with all the other participants who have been quoted, explicitly waived his right to anonymity and indicated his real name could be used. As with all the other participants, he gave this permission after reviewing sections of the draft findings in which he had been quoted. Our justification for opting to use real names with permission is provided in the research methodology section (on the previous page).

HATAKKA, who expressed much enthusiasm. HATAKKA, who had previously gained considerable experience of teaching communication in engineering institutes, has said project-based learning in such contexts was "very avant-garde in 2005," when she joined the university. CRAIG also gained support from other departments, recalling that engineering colleagues and administrators were very supportive of the new approach they were developing. [17]

By late 2005, the growing university was seeking to recruit new faculty for its communication department, targeting specifically PhD holders with relevant experience (the department was then staffed mostly by MA holders). The advertisement that was placed in the *Times Higher Education Supplement* at this time (a copy of which was supplied to the first author by one of the participants) stressed that the project-based courses were focused on developing well-rounded, autonomous lifelong learners being able to draw on 21st century higher order thinking and communication skills; they attracted applicants with international reputations, including the next two heads of department, Roger NUNN and Caroline BRANDT. NUNN explained:

> "The holistic project based nature of the courses appealed to me. I was developing project-based learning in Japan and was also developing holistic task-based units of instruction. It is important that the students are fully engaged in a course producing something real before we can really teach them in a fully meaningful way." [18]

BRANDT was also attracted by the "project-based approach, which [she] believed to be ideal in that it creates manifold relevant opportunities for interaction and communication." Features of the courses that appealed to her included the addressing of integrated language skills as well as academic and professional skills (which would be built on through successive years within the structure of the degree program), and student freedom in choosing project topics, which were thus likely to be relevant to the students' developmental levels, interests and needs. A further attraction, she highlighted, was that a course book would not be used.

> "I have never believed in the wholesale imposition of material selected by outsiders in such contexts, as to take this approach not only risks introducing culturally inappropriate or uninteresting, even clichéd, material, but its import suggests that there is nothing of interest or use to language learners in the local context." [19]

Similarly, Asli HASSAN, who also joined the university in 2006, has reported that what appealed to her was that the courses were "not driven by textbooks, and teachers had the flexibility to augment a variety of materials into the curriculum." In some ways, though, while there was a lot of freedom, the courses were still "in their infancy," as NUNN has described the situation at the time. The syllabus was still evolving in 2006, with assessment tasks being developed and in-house seminar texts being added from then on. [20]

4.1.2 Developments

Within a few years, the situation had changed. The holistic project-based communication courses that had been developed by 2010 included a "framework for learning study and research skills and developing academic communication and language ability, [with] a variety of spoken and written tasks based on the needs of engineering students [used for assessment] at different stages" (NUNN & THURMAN, 2010, p.12). Evidence of the thinking of communication faculty contributing to curriculum development up to and around this time can be found in, amongst other sources, publications produced by them, and we now turn to these publications. [21]

An analysis of the titles of journal articles, chapters and conference papers produced by communication faculty between 2006 and 2010 reveals a concern with some of the following: designing holistic units for task-based learning, developing rubrics for task-based oral performance, developing a holistic rationale for rubrics to be used in project-based courses, using such rubrics as teaching and learning tools, assessing integrated skills, developing presentation skills that incorporate use of PowerPoint or posters, integrating extensive reading into task-based learning, developing critical reading skills, scaffolding academic acculturation through the use of journal articles as teaching resources, supporting literacy skills development, assessing how writing in teams affects the writing of individuals, and developing reflexivity in academic communication skills. [22]

Interestingly, an analysis of the titles of publications of communication department faculty in the following five-year period (2011-2015) reveals not just a continuing focus on such themes but also an emphasis on related but distinctive concerns. Regarding individuals' writing skills development, for example, there has been a focus on supporting the development of voice, identity, agency and academic referencing skills. There has also been a greater focus on teamwork, for example on team formation processes, supporting undergraduates' teamwork skills through collaborative teaching, the impact of the development of team competencies on student engagement, resolving conflict in such teams, teamwork satisfaction. There has also been a focus on the development of out-of-class scaffolding mechanisms, for example on the setting up of a writing center staffed by peer tutors, and on the transfer of learning that can take place facilitated by the developing competence of these peer tutors. Discussing such innovation, BRANDT argued writing centers "are particularly useful in encouraging greater student responsibility and accountability," while of peer tutors she said, they "bridge a critical gap for students, offering support in the space between dependency on faculty and independency." [23]

Besides the developing research interests of existing faculty, likely shaped by the sociocultural context (BURNS et al., 2015; ENGESTRÖM, 2001), refinements in the research focus of communication department publications since 2011 might also reflect recruitment strategies, since the department grew further from that time. To better understand this possible effect, faculty who have taken on leading roles in the recruitment process in recent years (either as departmental chair or

chair of the relevant committee) were asked about the qualities they have looked for in job applicants (typically for assistant professor in communication posts). BRANDT highlighted immediately: "Commitment to team and project-based learning and a full understanding of the opportunities it presents for our students and ourselves as scholars." Nicholas DIMMITT, who joined the department in 2011, adopted a similar stance: "Experience with and enthusiasm for project-based, student-centered curriculum and learning." NUNN, too, indicated that "previous experience in project-based learning" was sought. However, where this experience was lacking, he reported having looked "for an obvious sympathy for a social constructivist approach to learning which underpins [the department's] approach and some previous attempt to put this approach into practice." Also taking a slightly more relaxed attitude towards the need for relevant experience, Tanju DEVECI, who joined the department in 2012, indicated: "Some background in the kind of work we do will be very useful, but not an absolute must." These data would all suggest, in balance, that an orientation in candidates towards project-based learning would have been viewed favorably. [24]

Of course, other qualities were also important. For example, BRANDT indicated she looks for: "Willingness, determination and ability to demonstrate as a member of the team the same skills expected eventually of students. These would include: being cooperative, constructive, adaptable, responsive and resourceful; able to take initiative, able to reflect and think critically." Similarly, DEVECI highlighted that, besides being creative and able to think outside the box, new colleagues "should establish good relationships with students as well other instructors teaching the course [and] should be open and flexible," while DIMMITT stressed the need for an "ability to collaborate and learn with colleagues" as well as "a passion for teaching." An eagerness "to engage in research on teaching and learning" was cited as important by DEVECI, while NUNN similarly highlighted that the committee responsible for recruitment "looked for teacher-researchers as [they] felt this was the way to really have an impact on improving learning"; BRANDT expressed interest too in "scholarship in areas relevant to the work of the department and evidence of willingness and ability to develop [a] research profile in this direction (though not exclusively)." These recruitment policies may, then, have supported the development of synergy within the department, with team players committed to the principles of project-based learning and interested in researching their classroom practices likely given preference. [25]

Working practices are also likely to have strengthened the developing community of practice. BRANDT, for example, has described the environment "as a culture of opportunity for sharing ideas and experiences and receiving constructive feedback," which, she reported, has shaped her contribution to the curriculum. Without this sharing culture, she felt, she may have been less willing to open up the results of her interventions in the classroom to others and the materials she has developed. Such materials have been described as "extremely helpful" by a faculty member who joined in 2015, Jessica MIDRAJ, who reported it is "comforting" to be "part of a department that shares a similar belief in that various materials are shared, but it is up to the individual faculty member to decide how

best to 'teach', [given] the different needs and preferences" of learners. Similarly, Nader AYISH, who joined in 2014, highlighted the need "to modify or supplement available material, given the wide range of skills and experiences students bring to class," and affirmed he feels "empowered" to do this within a project-based approach at the university. He has thus perhaps been "subordinating teaching to learning," as BRANDT put it, paraphrasing Caleb GATTEGNO (1970) while describing her own practices. Collaborative research has been part of this sharing environment. NUNN, for example, highlighted having learned much from observing colleagues and then analyzing with them "local data" gained from "local students." [26]

These data thus all suggest a developing community of practice with many shared values, such as prioritizing the needs of learners and basing understandings of these needs on research, promoting the development of teamwork skills required subsequently in the program and throughout an engineering career, and working sensitively and creatively with self-produced and adapted materials to engage learners in meaningful project work. Inevitably, though, emphases might vary and we now consider the terms that different faculty members have used to describe the pedagogical approaches they have taken to gain further insights into their cognitions. [27]

4.2 How have faculty members conceptualized their pedagogical approaches?

For some faculty, definitions of their pedagogical approaches have centered very closely on learners and their needs, e.g., DIMMITT, who described the approach he follows as "experiential student-centered learning ... realized through project-based research activity" in which the teacher's role is to "facilitate discovery and guide student development." Perhaps placing more emphasis on the learning qualities developed, CRAIG has opted for the term "inquiry-guided learning," since a key aim, he reported, has been "to develop 'inquisitiveness', [this reflecting a need to develop] critical thinking, questioning, considering alternatives." Similarly, BRANDT indicated preferring the term "inquiry-based learning" to "bring together under one umbrella various aspects of a team and project-based approach." She explained:

> "Students working in teams on a project have an (often urgent) need to do things, to find out things, to collaborate and communicate things. These needs may be artificial at first, constructed by the instructor, but this feature is very quickly lost as students become absorbed /submerged in their project and all the tasks they have to accomplish in order to arrive at a successful outcome. If this is supported by clearly-communicated standards and timely guidance in how to demonstrate or reach these standards, which is one of the roles of the instructor, then students have the opportunity not only to practice their skills but to improve them. Ideally students will be so absorbed by what they are trying to achieve that they will not notice that they are practicing or developing their skills unless their attention is drawn to this, or until they are expected to use them at a later stage, in a different context." [28]

Other faculty have emphasized the importance of context in defining what they do, e.g., DEVECI, who highlighted that the students' projects are "related to their studies and lives," MIDRAJ, who described her approach as "essentially project-based as it uses authentic tasks with real data," and HATAKKA, who indicated preferring the term "context-based approach." Explaining this preference, she highlighted that the students' projects are centered upon their immediate surroundings, themselves as engineering students, their university campus, city and country, and this context determines their focus and how they work. [29]

Some have used what they have termed a "problem-based approach," e.g., DEVECI, who highlighted that "at least until recently [they had] asked students to identify problems/issues they or their peers are confronted with as university students and conduct some investigation to 'unpack' them and come up with some solutions," a definition of "problem-based learning" that fits with research he has cited (DEVECI, 2013). However, DEVECI reported considering "project-based learning" to be a more accurate description of his practices "since not all learning may be based on a problem." Other faculty used the term "problem-based" in other ways, e.g., HASSAN, who used it specifically with regard to addressing "areas of weakness" in students. However, she argued, "the courses follow a project-based approach as they begin with the formation of teams that develop a researchable topic that expands throughout the whole semester. The faculty uses the project to teach writing literature reviews (paraphrasing, quoting), presentation skills ..." Similarly, AYISH has reported that while he has tried to follow "a more traditional project-based learning model, circumstances have compelled [him] to create, at times, a hybrid project-based and problem-based learning environment." He explained that this modification "is usually caused by circumstances beyond [his] control (e.g., a disruption to the schedule or a lack of fundamental skills among some students)." However, while the approach he has outlined here might seem to differ from those of other faculty reported above, the positive outcomes he has reported are perhaps not dissimilar to those suggested by colleagues emphasizing that they support "inquiry-guided" or "inquiry-based" learning:

> "In the end, I believe students walk away from class better understanding what it means to question themselves, seek answers to problems of significance, and follow established research principles that will serve them well irrespective of the area of study they pursue." [30]

Terminological differences can perhaps be over-played, though they might also reflect a diverse range of experiences and influences from different parts of the world. Reflecting on having used project-based activities for more than 15 years in different Asian contexts, for example, DIMMITT reported having come to believe that such an approach is "an extremely effective way for students to learn and a joy to teach [fitting with his] belief in students learning best by doing." BRANDT recalled the "holistic, humanistic approaches to the classroom" encouraged at International House in Hastings, where she had spent her formative years. HATAKKA felt her "context-based approach" is grounded very strongly in her experience of instrumentally helping students become better

engineers by "learning and applying the kinds of academic, technical and business-oriented (and critical) thinking and communication skills that will help them succeed." NUNN reflected on "principles related to holistic learning and interactive approaches to teaching" which had earlier shaped his work in Japan. For NUNN, "holistic project-based learning" "is an umbrella term within which principles behind other related terms can be applied (such as problem-based learning, social constructivism, active learning)." He continued:

> "It reflects best the actual curriculum framework we use—a semester long project provides a holistic framework by definition. It is not an alternative, it is a superordinate term that encompasses the other terms I have heard colleagues use." [31]

Nevertheless, the different terms used by faculty can be seen as a way of expressing identity and individualism within a community of practice throughout which many principles seem to be shared. This variety of terms could potentially be disconcerting, though, to some. In the field of practitioner research, BORG, cited in WYATT, BURNS and HANKS (2016), for example, criticizes such a practice, arguing against a proliferation of terms. DALTON also questioned it: "In education, we seem bedeviled with 'crossover' terminology and the need to re-invent the wheel! An inquiry-based approach, for example, has many of the features of project-based learning. Different cat, same neighborhood?" [32]

4.3 How has a project-based approach been realized in practice?

Asked how the approach they adopted has translated into actual practices, participants provided answers apparently consistent with espoused principles. For example, DALTON reported that he realizes an inquiry-based approach through processes such as "helping students create research questions of their own, obtain supporting evidence to answer these questions, explain the evidence collected, connect this explanation to the knowledge obtained from the investigative process and create an argument and justification for the explanation." Meanwhile, DEVECI discussed incorporating meaningful learning activities into his lessons, building a positive rapport with students, encouraging learning outside the classroom and sometimes focusing in class at a micro level on language issues (e.g., related to academic vocabulary building) within the holistic project-based approach he favors, using a term here that seems to appropriately encapsulate his practices. [33]

Besides such self-reported evidence from faculty, further insights into classroom practices can be gained from observations of them teaching and of their students engaged in learning, as well as from interviews with their students. Though it was outside the scope of this study to collect such data for this particular purpose, there was the potential to draw upon and repurpose data that had previously been collected in the research context and were available through having featured in published studies, and we now turn to these data. [34]

Regarding the observational studies first, several have explored teaching methodology, e.g., NUNN (2012), which, from a "method-in-use" perspective

(p.1), analyzed two lessons taught by different faculty members, exploring teachers' and students' roles, types of pedagogical activities, types of discourse and discourse outcomes. The lessons were actually very different, with one organized in a devolved way, students working in small groups on their projects while the teacher circulated, monitoring, and the other teacher-fronted. It emerged in post-lesson discussion, though, that the teacher-fronting in this second lesson was not planned; the students had not brought the materials to class that would have allowed them to work in small groups, as had been intended by the teacher, and therefore adaptation was required. In this adapted lesson, (authentic) material that had been produced by students (a survey results section of a project report) was shown on the screen and discussed by the whole class, with particular features highlighted to support analysis (content and linguistic) and text evaluation (this thus supporting the development of critical thinking). Regarding the nature of the whole class discussion, moreover, the teacher-fronted discourse featured a broad range of negotiation types, including reflecting, probing and elaborating, and, indeed, the style of interaction, welcoming broad participation, appeared to make it "easy for students to participate fully" (NUNN, 2012, p.7). Despite the lack of opportunities for teamwork, therefore (due to circumstances the teacher had not anticipated, this requiring a change in his plan), features of a project-based approach one would expect to find, such as scaffolding of student responses in relation to learner-generated material, a focus on detailed analysis within a holistic structure and the encouragement of critical thinking, were in evidence. The other lesson reported in this study (NUNN, 2012), taught by a different teacher, also contained a teacher-fronted segment, but this, featuring much probing elicitation, lasted for only five minutes, and thereafter the students worked in groups for the remainder of the lesson (45 minutes), reflecting through a focused activity on progress with their different topics and thus benefiting from the opportunity to develop implicit knowledge while engaged in a meaningful task (ibid.). [35]

Other observational studies in the same context (NUNN, 2010; NUNN & HASSAN, 2015) have also reported on devolved lessons (like this second one), with the learners working mostly on their projects in groups. Of these observed lessons, NUNN (2010, p.64) describes the "discussion and co-planning of the literature review of a group-written research proposal [that] was student led and totally devolved with no intervention after the first five minutes." The group dynamics varied considerably, with students in different groups interacting in ways that reflected factors such as intermingling personalities and their different group organizations. Much on-task behavior of different kinds was observed, the "extensive discussion" and "negotiated debate" (p.66) likely leading to beneficial learning outcomes such as increased teamwork and deeper critical thinking skills. [36]

Such benefits are also likely to have resulted from another devolved lesson in the same context, this lesson described by NUNN and HASSAN (2015) as starting with relaxed, informal whole class input, before the students, working in groups, developed and delivered mini-presentations about research methods of choice. Following each presentation, there were whole class discussions involving

participation through questions and answers, clarification, elaboration. The teacher's presence was low key; it was apparent that "by sitting with the students ... she [was trying] not to dominate the discussion" (p.93). Nevertheless, she seems to have played a crucial role in stimulating critical thinking. For example:

> "when some of the students talked about the selection of their research methods as a task in isolation, the teacher had to refer them back to their literature findings to show/make the connection, [so that they] had to justify, negotiate and explain their choices" (p.94). [37]

Besides observational data such as these exploring the role of the teacher in developing critical thinking and teamwork skills through project-based learning, there have also been observational studies in the same context focusing on the development of such skills in learners, e.g., NUNN et al. (2016), which includes transcripts of a team discussing synthesizing information for a literature review. Other studies have analyzed student-produced texts to explore the development of academic literacy through collaborative project work (NUNN & LANGILLE, 2016) or included reflective interviews of students discussing how they worked in teams, e.g., to develop critical thinking skills (HASSAN, NUNN, AL-HASANI & AL-ENEZI, 2017; NUNN, DEVECI & SALIH, 2015). Collaborative teamwork seems valued, e.g., by one of DEVECI's (2013) interviewees, who reported: "Small group discussions make me feel my opinion is valued. So I tend to say more now compared to my high school years" (p.126). Voices of learners such as these can illuminate their teachers' pedagogical practices, which seem consistent with a holistic project-based learning approach. We now discuss results. [38]

5. Discussion

In the traditions of qualitative case study research, we set out to understand, from a sociocultural/sociohistorical language teacher cognition perspective (BURNS et al., 2015) owing much to principles based on CHAT (ENGESTRÖM, 2001), how a community of practice centered on holistic project-based learning had developed and been sustained at an engineering university in the Middle East. Findings drew on multiple voices, with questions exploring sociohistorical changes within the "collective, artifact-mediated and object-oriented activity system" (p.136). These findings appear to suggest that initial enthusiasm, targeted recruitment and collaborative working practices had led to a strengthening of this community, with the sociocultural context apparently shaping as well developing research interests. An additional conclusion we came to, after exploring tensions and contradictions inherent within an activity system (ENGESTRÖM, 2001), is that, while faculty conceptualized their pedagogical approaches in slightly different ways, these conceptualizations perhaps reflecting their identities and personal histories, there also seemed to be a form of "collective pedagogy" (BREEN, HIRD, MILTON, OLIVER & THWAITE, 2001, p.496) within the community of practice, with synergy noted between cognitions and practices. [39]

While drafting this conclusion, we are conscious that, shaped by sociocultural influences since we collected our data, the community of practice described here

has continued to change, so that our "thick description" (GEERTZ, 1973, p.310) has presented a vanishing world. Nevertheless, given the complexities involved in building such a community of practice, as described here, we feel that insights generated by this study might be of interest to academics in other engineering universities (including those in the Middle East) considering a similar project-based learning approach to developing communication skills. These insights might include the need to recruit curriculum managers committed to the concept of project-based learning and allow them space to develop their ideas so that they can build a syllabus appropriate for the context, a team willing to use this syllabus in nuanced learner-sensitive ways and an environment characterized by sharing. Through "thick description" (ibid.), we have provided evidence of how this combination of factors appeared to help in establishing project-based learning communication courses at our university. [40]

Of course, though, there are limitations to our research. While our findings regarding the degree of synergy within the community of practice seem to extend those of HATAKKA (2008), it should be emphasized that the methodological approach adopted, as described above, perhaps made it less likely that discordant voices would be heard. Moreover, if the key methods had included observations of faculty, rather than repurposed observations, and if these were linked to full semi-structured face-to-face interviews, this methodology might have done more to support the triangulation (STAKE, 1995) we did achieve. Further research utilizing observations and interviews in tandem could explore more closely fine differences underpinning the nomenclature used by different faculty members within a department to describe their pedagogical approaches and explore the realization of these approaches in practice. Nevertheless, we also feel that our methodological decisions suited our focus well. For example, our choice of open-ended surveys for this particular study reflected the aim, based on working from a sociocultural/sociohistorical perspective in language teacher cognition research (BURNS et al., 2015), inspired by CHAT (ENGESTRÖM, 2001), to inclusively collect data from every faculty member willing and able to participate in as manageable a way as possible (for to observe and then interview them all would have been overwhelming). This methodological decision has resulted in a fairly broad but also richly-detailed picture composed of multiple language teacher cognition perspectives. [41]

We conclude by quoting BRANDT on how invigorating working with learners through holistic project-based learning can be:

> "I've frequently been asked how I've been able to teach the same two courses for years without getting bored. I've always responded that the team project-based approach means that every realization of the syllabi is unique. The students are new, teams are new, times have changed, and the topics are new or variations. The approach relies on interactions: among students, with me, and between students and their resources, and as people are central to these interactions, courses differ from one to the next as much as the people do. I'm constantly being surprised and I'm constantly learning." [42]

Appendix: Sample Open-Ended Survey Questions (Asked of Caroline BRANDT)

1. When you were applying to join the university, what appealed to you about the communication courses?
2. In which key ways have you helped shape the development of these courses in the intervening years?
3. To what extent and in which ways do you believe your contribution to the curriculum here has been shaped by your principles, prior teaching/learning experiences and factors relating to the local context, including collegial support?
4. When recruiting new faculty to work on communication courses, what qualities are you looking for?
5. In your research, you have described your work on these courses in terms of "inquiry-based learning." How has such an approach been realized in practice in communication classes you have taught?
6. Why did you opt for the term "inquiry-based learning" rather than alternatives?
7. Is there anything you would like to add on this topic?

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