Mentor or Facilitator: Defining Relationships in an English for Specific Purposes Project-Based Learning Classroom Context

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Abstract

From 2014 to 2017, language faculty and engineering faculty from a Japanese national university co-taught three Project-Based Learning (PBL) English language courses of 24 architecture and mechanical engineering students. In trying to understand the roles and the relationships between the English-language instructors, the engineering faculty, and the students, the authors have turned to Dawson (2014), who identified 16 mentoring design elements to assist in conceptualizing a non-conformed definition of mentoring, and Hmelo-Silver and DeSimone (2013), who defined facilitator as "expert learners, modeling good strategies for learning and thinking rather than providing content knowledge." In this paper, the authors will first outline the overall structure of the course and describe the general engagement patterns of the two language teachers and four engineering faculty involved. Then, using Dawson's mentoring framework and Hmelo-Silver and DeSimone's definition of 'facilitator' in a PBL classroom context, the authors will describe the differing roles of the participating instructors, and also the student-instructor relationships among each of the six instructors involved with the course. Finally, they will conclude with remarks on how understanding and defining these relationships in a mentor-facilitator context can be useful for creating PBL- and active learning-based courses and curriculum in the future.

Keywords: mentor, facilitator, project-based learning (PBL), English for Specific Purposes (ESP)

1. Introduction

The Ministry of Education, Culture, Sports, Science and Technology (MEXT) places project-based learning (PBL) as a vital element in reforming Japan's education system by 2030. The objective is to make Japan a place able to thrive in the 21st century (Suzuki, 2015). With this reform effort, MEXT highlights skills gained through pedagogies like project-based learning, such as critical thinking, communication, and forethought, as requirements for success in a 21st century globalized

world (Suzuki, 2015). By setting the year of achievement at 2030, MEXT implies it is taking a long-term view in reforming education and in preparing Japanese society for the future. This longitudinal view of reform was the core of a research endeavor described in this paper. Furthermore, the main research question to be explored is as follows: how are the relationships between students, teachers, and administrators defined within a project-based English for specific purposes class?

The following sections contain the research study objectives, course description, and explanation of the theoretical framework. We will discuss the analytical approach based on the theoretical framework, and how the reflective process allowed us to discover new areas — mentorship and facilitation —for reinterpreting our past research. These two concepts are the basis for informing the answer to the above-stated research question. The concluding section of this paper will lay out future research possibilities as well as implications for curriculum development.

2. The Course

The authors originally designed and conducted a course for a longitudinal research study that looked at the effects a project-based learning class, specifically for English for specific purposes, had on multiple groups of engineering and architecture students at a national university in Japan. By the end of the full research project, the authors taught three 15-week iterations of the project-based learning course. The classes were in three separate semesters: April 2014-August 2014, October 2015-February 2016, and October 2016-February 2017. Student participants totaled 72. The authors collected a wealth of qualitative data from various sources including open-ended questionnaires, professional journals, and student and faculty interviews. This data was used to revise the course, but also provided source research material for a project funded by a grant from the Japan Society for the Promotion of Science.

2-1. Inspiration

The current state of Japan seems to be defined by a search for identity, or a reaffirmation of a perceived dominance painted by the astronomic success of Japan throughout the 1980s. Governing bodies as well as socio-economic and socio-politico organizations in Japan are trying to invigorate the populous to deal with the implications of being a major economy in a world defined by globalization. This macro-understanding of the world has real implications for institutions of higher education responsible for educating and training the human resources of the future: the designers, builders, and leaders of tomorrow.

Therein lies the simple inspiration for creating an English language class utilizing a project-based learning pedagogical approach. The driving force was to create communicatively competent professionals who will be able to contribute to Japan as a nation, and a member of the world of nations (Ravesteijn, De Graff, & Kroesan, 2006). Also, this class was created based on actions by

government ministries, such as MEXT, to fund programs allowing institutions of higher education to create and implement programs that will develop the critical thinking skills, communication skills, emotional intelligence, global competence, and many other characteristics of university students, while preparing them with practical English language skills to be able to professionally perform in the 21st century (Suzuki, 2015). University students are being called upon by businesses and society to engage more with the world in order to bring the benefits of globalization to Japan. Without the ability and skill to think critically, communicate effectively, or empathize appropriately, Japan could be on the negative end of what globalization has to offer.

2-2. Planning

The development of this project-based learning course can be summed-up with two words: *collaboration* and *meetings*. From October 2013, the authors and the director of the department where they taught met with a group of four engineering teachers with the goal of designing projects suitable for second year first semester mechanical engineering and architecture students. Prior to these meetings in October of 2013, the director met with various administrators to ensure adequate class time and financial resources could be allocated for a course of this nature. Also, the heads of the department in the Faculty of Engineering met with the authors and their director to determine which engineering teachers wished to be a part of this class. Based on anecdotal responses from engineering teachers and university administrators, this interdepartmental approach was unique for the university. For a new class designed in this way, planning took much longer and involved many different levels of university administration and faculty approval.

By October 2013, the course instructors of the class had been determined. What was needed was a tangible curriculum, and students. All the details were worked out over weekly meetings between the director, English language instructors, and engineering faculty. The initial syllabus was developed by April 2014. By that time, 24 students were chosen to be in the course. Extensive discussions transpired about how to choose the students. Since all engineering students in the university were required to take the Test of English for International Communication (TOEIC) twice a year, this gave the planning group a relatively objective way of choosing the most English-proficient students in terms of the ability to read and understand technical English. Ultimately, twelve mechanical engineering majors and twelve architecture majors were selected based on the highest TOEIC scores within each major.

Eventually, a meeting with the selected students was scheduled. During this meeting, the students were informed about the unique parameters of the class compared to other English courses, and asked to participate. The choice to participate in the class was 100% voluntary, and instructions were given in Japanese to ensure full comprehension of the benefits and risks of participating in the course. If a student did not want to participate in the course, they had the ability to withdraw and

instead be placed in a regular non-PBL English class. There was no penalty of any kind for choosing not to participate. In the end, all the students who participated in this class volunteered to do so. This remained the student selection policy for all following iterations of this class.

2-3. Course Objectives

In designing the objectives that would guide the course, the instructors drew upon the initial inspiration for the class. The literature identified critical thinking skills, communication skills, emotional intelligence, and global competence as traits university students would need for 21st Century careers. Based on the pre-mentioned research, the following objectives were derived:

1. To improve engineering English skills;
2. To improve professional presentation skills;
3. To improve collaboration skills; and
4. To improve critical thinking skills

These objectives were created with the rationale that students may not have ever heard of project-based learning, or know the epistemological and ontological roots of the approach. This emphasis was also important so that faculty and administration were aware of these critical components for the class. The rationale was that if university faculty and administrators saw that the English language instructors were taking a real academic approach to curriculum planning, the course would gain positive recognition and build good will, which could be important when implementing the class.

2-4. The Projects

The following subsections will lay out the details of each project as designed by the engineering faculty, who were a vital part of this class, and the English language instructors. These are brief descriptions containing the core elements of each project. Throughout all projects, engineering faculty who work in professional circumstances provided technical support to the groups by means of lectures and class-to-class feedback concerning the process of building the projects. At any given time, there were at least three faculty members in any one class – two English language instructors and one engineering instructor. All projects for the first iteration were completed within one academic semester – April 2014 to August 2014. Students were required to keep professional journals using a log (journal) sheet where they would record vocabulary, concepts, and other information pertinent to their learning (Beckett & Slater, 2005). This was complimented with a page for freewriting designed to allow the students to reflect, explore, and communicate directly with the teachers.

Construct a bridge. In teams of four, each team was given materials to make a bridge that could

carry the weight of ten kilograms. All teams were issued the same materials – plywood planks and beams sufficient to make a miniature bridge. Grading criteria included weight – the less the finished structure weighed the higher the points to be awarded; aesthetics – a judging and ranking system was employed to determine the best looking bridge by where the students chose the top three most aesthetically-pleasing bridges; and displacement of the bridge when holding up to ten kilograms – the engineering professor collaborating for this project used a laser displacement mechanism to determine the structural integrity of the bridges by where the bridge that held the steadiest and bent the least received the most points.

Make a luminaire. Again, in teams of four, students were tasked with designing and building a lighting fixture – a luminaire. With this project, each of the teams had to buy original materials they had planned to use in constructing their luminaires. All student expenses were reimbursed through department budget allocated for the class. As for grading, students were graded on the aesthetics of the luminaires. To decide the most aesthetically pleasing lighting fixture, a judging and ranking system was again employed.

Design eyewear. The third project had different parameters than the bridge and luminaire projects. Students were presented with a challenge to design eyewear for particular country markets – Italy, Germany, Dubai (United Arab Emirates), India, Denmark, and the United States. The president of a local prominent eyewear production company presented this challenge with the goal to only design the glasses. For this project, there would be no physical product made. Students designed the glasses based on market research, then proposed the idea to the president of the company in a public presentation. The president of the company selected the best three designs. As this was the final project, it was planned to culminate in a community-wide public presentation, which was open to and attended by the university and surrounding community, and covered by local and national press.

Throughout all three projects student teams had goals they had to reach, but how they achieved those goals depended a lot on team dynamics, instructor support, and ability to understand the materials provided to them. Each project resulted in student teams giving a presentation to their classmates and instructors, in English. The final presentation was larger and more consequential than the previous ones. Following the success of the graded public presentation, the student groups had the opportunity to bring their presentation from university grounds to an actual local community eyewear event where they were able to present their designs to real people working in the eyewear field.

3. Theoretical Framework

While this class was primarily a pragmatic class that produced physical products to be presented to a broader community, it also supplied excellent opportunities to develop relationships between

all parties. How these relationships are defined is the focus of the current reflective process. The following theoretical framework not only served as a guiding hand when having to draft and implement the previously stated curriculum, but the conceptual approach to mentors and facilitators allowed for more salient understanding of the relationship dynamic between students, instructors, and administrators.

3-1. Project-based learning

Project-based learning is a pedagogical discipline that advocates brainstorming, creativity, and production of physical specimens that represent a pre-set goal. Educators have tried to define PBL by analyzing and describing the traits of what a project-based learning classroom should look like. Mergendoller and Larmer (2015) identified eight essential elements of project-based learning that included:

1. Challenging problem or question
2. Sustained inquiry
3. Authenticity
4. Student voice and choice
5. Reflection
6. Critique and revision
7. Public product
8. Key knowledge, understanding, and success skills.

In earlier literature, Capraro, Capraro, and Morgan (2013) highlight the stated complimentary aspects of project-based learning and critical thinking by saying:

Project-Based Learning is … composed of several problems students will need to solve. It is our belief that PBL provides the contextualized, authentic experiences necessary for students to scaffold learning and build meaningfully powerful science, technology, engineering, and mathematics concepts supported by language arts, social studies, and art. STEM PBL is both challenging and motivating. It requires students to think critically and analytically and enhances higher-order thinking skills. STEM PBL requires collaboration, peer communication, problem-solving, and self-directed learning while incorporating rigor for all students. STEM PBL builds on engineering design as the cornerstone and as the foundation on which students bring their compartmentalized knowledge of science, technology, and mathematics to bear on solving meaningful real-world problems (p. 2).

Finally, the authors also drew from the work of Prince and Felder (2006) who described PBL using the following eight characteristics:

Teams of students;

Open-ended assignments;

Resembles professional life;

Students formulate solutions strategies;

Measure approach against a goal / result;

Broad scope, several problems;

End product is central; and

Applying integrated knowledge (not acquiring).

The above definitions, characteristics, and descriptions of project-based learning allowed the instructors of the class to maneuver with a certain amount of confidence when constructing the schedule, organizing projects, facilitating lessons, and evaluating students. This firm grounding also allowed the instructors to reflect and discover new areas of inquiry, in particular how relationships manifested within the PBL approach. Two main relationship dynamics were discovered – facilitator and mentor.

3-2. Facilitator

The process of reflection is a never-ending one. When re-investigating this class after a few years, the question of what role instructors played was raised constantly in attempts to learn lessons to be applied to other classes. Were the instructors' pure language instructors/teachers, or something else? The need to understand this relationship dynamic is the main research question guiding the current qualitative inquiry.

After reviewing familiar texts (Prince & Felder, 2006; Capraro, Capraro, & Morgan, 2013; Mergendoller & Larmer, 2015), the authors discovered the idea of *facilitator* as defined by Hmelo-Silver and DeSimone (2013). They state that facilitators were "expert learners, modeling good strategies for learning and thinking rather than providing content knowledge" (p. 373). This depiction illustrates the dynamic within the classroom context of this class. The language instructors modeled what to do in terms of communicating ideas rather than imposing some specific knowledge about engineering concepts.

It should be noted that Hmelo-Silver and DeSimone were working in a *problem*-based learning context, as opposed to the authors, who worked in a *project*-based learning context. However, the main definition given by Hmelo-Silver and DeSimone (2013) defined problem-based learning as "a learner-centered pedagogical approach in which students engage in goal-directed inquiry" and "students work collaboratively to learn through solving complex and ill-structured problems," which is very similar in language to the previously stated definitions and descriptions of project-based learning (p. 370). Furthermore, John Larmer (2015), editor in chief at PBLWorks/Buck Institute for Education, described the difference between project-based learning and problem-based learning as

“more a question of style and scope,” because “there's really not much conceptual difference between the two PBLs.”

3-3. Mentor

To gain an understanding of the relationship between the content instructors (engineering professors) and students, the authors returned to the literature on PBL and facilitators. Expanding the research parameters to now include mentoring, the authors found Dawson (2014), who provided a meta-analysis on mentoring and how to define the concept. Dawson identified 16 elements that framed what a mentoring relationship entails (see Table 1):

Table 1

Dawson's (2014) Summary of the Design Elements of Mentoring

Objectives	the aims or intentions of the mentoring model
Roles	a statement of who is involved and their function
Cardinality	the number of each sort of role in a mentoring relationship
Tie Strength	the intended closeness of the mentoring relationship
Time	the length of a mentoring relationship, regularity of contact, and quantity of contact
Relative Seniority	the comparative experience, expertise, or status of participants
Selection	how mentors and mentees are chosen
Matching	how mentoring relationships are composed
Activities	actions that mentors and mentees can perform during their relationship
Resources and Tools	technological or other artifacts available to assist mentors and mentees
Role of Technology	the relative importance of technology to the relationship
Training	how necessary understandings and skills for mentoring will be developed in participants
Rewards	what participants will receive to compensate for their efforts
Policy	a set of rules and guidelines on issues such as privacy or the use of technology
Monitoring	what oversight will be performed, what actions will be taken under what circumstances, and by whom
Termination	how relationships are ended

These elements dutifully frame and describe a mentoring relationship and what goes into identifying one, committing to one, nurturing one, and ending one.

For the purposes of this paper, the authors wanted to analyze the relationships of the participants in the PBL course. First, the four sets of participants identified are: the *language instructors,* the *content instructors* (engineering professors), the *administration*, and finally, the *students. Language instructors* were the participants who focused on imparting language knowledge and study techniques that were suitable for the *students,* while working with *content instructors*

by informing on the language used for actual engineering concepts and content. *Content instructors* helped inform and develop the engineering content that was suitable for the *students,* and took cues from the *language instructors* with regard to English language use for materials and the classroom. *Administrators* connected *language instructors* with *content instructors* (particularly in the first iteration of the course), and worked on securing *students* and any special funding. *Students* participated in the course for learning skills and knowledge from the *language instructors* and *content instructors.*

Since the authors were only looking for relational elements, they focused on only six of the elements described in Table 1 that appeared relevant for assessing the relationship aspects between mentor and mentee: (1) *Objectives,* (2) *Roles,* (3) *Activities,* (4) *Relative Seniority,* (5) *Matching,* and (6) *Tie Strength.* The reasoning for paring certain characteristics out was they had had nothing to do with the actual relationship aspect between participants, such as in the case of *Resources and Tools* or *Role of Technology,* or they had no impact on helping to identify and define a relationship in the middle of the relationship, such as in the case of *Cardinality* or *Termination.*

When these six elements were applied to the project-based learning class described in this paper, and the instructor, student, and administrator dynamics within the class, the authors found a clear connection to the *content instructors* (engineering professors) as mentors to the *students.* This mentoring relationship is in contrast to the relationship between the *language instructors* and *students*, which is best understood as a relationship of facilitation. However, there was also a facilitating relationship between the *language instructors* and the *content instructors.* The following discussion will elaborate on the discovered connections identified using this theoretical framework.

4. Discussion

Hmelo-Silver and DeSimone's (2013) definition of facilitator and Dawson's (2014) 16 elements of a mentoring relationship allow for focused insight and dissection of the dynamics between all key participants in the class, thus providing a clear answer to the main research question – how are the relationships between students, teachers, and administrators defined within a project-based English for specific purposes class? Directly speaking, the *language instructors* were facilitators, and the *content instructors* were mentors. After discussing the role of the *administrators* within this class, the authors could not conclude the relationship dynamic using the frameworks of facilitator or mentor discussed in this paper, and so has been left as *undefined.* The overall relationship dynamics can be seen in Figure 1：

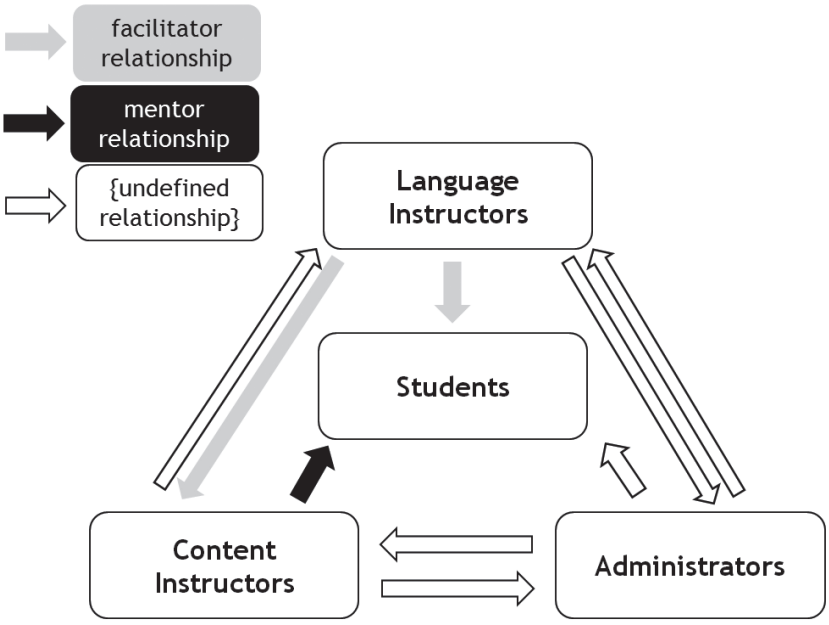

Figure 1

The proposed defined relationships between participants

Beginning with the *language instructors* it was clear to identify them as facilitators to the *students* and not mentors. The *students* in this class were not majoring in anything related to language studies; they were training to be professional architects and engineers. Instead of transmitting "content knowledge," the *language instructors* were providing good learning strategies for acquiring language skills as well as the appropriate use of that learned language in a presentation setting. This description is in line with Hmelo-Silver and DeSimone's definition of facilitators, who are, to reiterate, "expert learners, modeling good strategies for learning and thinking rather than providing content knowledge."

This is in partial opposition to an analysis using the highlighted elements above from Dawson's mentoring framework. To a certain extent, the *language instructors* and *students* themselves have in common an optimal outcome for the *students*. For example, for *Objectives,* both sides (in fact all sides) want the *students'* use of English in professional engineering settings to improve. *Activities* as well saw limited opportunities for mentoring in language use, particularly in presentation settings. However, the *Relative Seniority, Matching*, and *Tie Strength* are very weak among *language instructors* and *students* because they do not share an overall background or (potential) lived experiences; the *language instructors* are non-Japanese who specialize in non-engineering subjects and the *students* are Japanese who wish to become successful engineers in their future careers. Essentially, the knowledge that *language instructors* can impart on *students* is very limited in scope and not necessarily a large part of the future as seen by the students.

The above emergence allows the dynamic between the *content instructors* and *students* to more clearly crystallize. Looking at the same six elements from Dawson's framework, *content instructors* were the main mentors within the classroom. Ultimately, the students wanted to become professionals and experts in their varied engineering fields of study. This understanding created a situation where the best example of a professional future self for the *students* to see and emulate were the *content instructors* (the engineering professors) themselves.

Finally, the relationship between the *language instructors* and the *content instructors* is one of facilitation because it was built around the need to transmit specific content knowledge with the goal of improving the English language abilities of the *students;* the *students'* ultimate goal was to speak English conducive to a professional engineering setting. However, the *content instructors* were not experts in pedagogy, or language acquisition, or education in general. They needed to learn the broad pedagogical base that the *language instructors* had acquired over years of study and practice. This dynamic created a situation where the *language instructors* were the "expert learners, modeling good strategies for learning and thinking rather than providing content knowledge" (Hmelo-Silver & DeSimone, 2013, p. 373). The *language instructors* not only modeled these strategies for *students,* but also for *content instructors*.

A large swath of anecdotal evidence supports the above idea. *Language instructors* had multiple mini-counseling sessions with *content instructors* both inside and outside of the classroom on best practice to encourage *students'* use of English as the medium for discussing and planning engineering projects. For example, *content instructors* were initially apt to use Japanese as soon as signs of language communication breakdown occurred in English. The *language instructors* took special effort to ensure that *content instructors* understood that these types of communication breakdown happen, but the best practice is to use strategies such as reiteration or changing wording in English to facilitate communication, rather than give up and revert to L1.

5. Conclusion

The project-based learning class described in this paper started in September 2013 with an idea to focus on the communicative competence of engineers (Ravesteijn et al., 2006). With funding provided for the overall university by a Go Global Japan grant (MEXT, 2012), and the authors' own Japan Society for the Promotion of Science grant, an English course was fashioned that brought together disciplines – engineering and English language teaching – to provide students with an experience that would shape their professional, educational, and even personal lives. The initial goals were quite simple – provide a place to experience work life and improve English proficiency by building things. Throughout the years we have found that upon further reflection this class provided more than what we initially planned, and to a great degree yielded more than we could have even hoped for.

Regarding the two ideas discussed in this paper – mentorship and facilitation – there are three concrete conclusions we believe sum up this re-exploration of our research under the described theoretical framework. First, the authors believe that project-based learning planning, when foreign-language acquisition is not involved, can be seen, at a pure content level, as a mini-mentor relationship towards *students*. The *content instructors* (engineering professors) are the symbols of excellence and source of concrete, conceptual information for the *students;* they want to be professionals just like the content instructors.

Next, the *language instructors* can best be understood as facilitators within this foreign-language PBL classroom. Ideally, they were the instructors and constructors of the learning space. The *students* were not in the class to be *language instructors,* but they did benefit from the language environment the *language instructors* set-up in order to access the opportunity to further improve their ability in English in their selected professional field.

Finally, when multiple instructors are divided by content and language instruction, *language instructors* can take on facilitator-like relationships towards the *content instructor* colleagues, modeling good teaching practice with the intention of assisting the *students* in their learning goals. Teachers have their specialties. While the *content instructors* knew the engineering content because of their educational and professional backgrounds, they did not know how to communicate that knowledge to *students* so the students could understand the class concepts and material using English. We as *language instructors* had to advise the *content instructors* how to transfer knowledge in a way that would yield results directly relating to the English proficiency of the *students*.

In a re-exploration of the authors' data and experiences, it is clear this class was a special situation that through the passing of time and use of newly discovered frameworks provided innovative directions for research. One major research goal for the future is to continue to investigate the undefined relationships that surround especially the *administration* side of the equation in order to fully understand the relationship dynamics among all participants. Our belief is that while they play a vital role in university operations, *administration* are taken for granted, and deserve more illumination on their relationship to the educational goals of universities and other institutions.

Another area of exploration is to apply the principles and frameworks presented in this paper to other teaching situations to see what they can achieve. The students and teachers in this project-based class experience had a high-intermediate level of English, with some students being quite advanced. Using this framework with lower-level English students or students who wish to become English language instructors in a PBL setting would be an interesting direction that may yield different, fascinating results. For instance, students of a different discipline (English-language education, for example) could cause a relational dynamic that is more mentor-based between the *language instructors* and *students*. Differences in background among research participants could confirm (or deny) the relationship patterns that are described in this paper, but more research in this

vein would further shed light on what the roles are of instructors and students in a project-based learning classroom – mentor or facilitator (or even something new!). This discovery would further lead to informing potential PBL course creators of a better possible PBL environment for enabling learners to learn, no matter what the other roles are.

Authors' Note

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References

Beckett, G. H., & Slater, T. (2005) "The Project Framework: A Tool for Language, Content, and Skills Integration," *ELT Journal,* 59(2), pp. 108–116.

Capraro, R. M., Capraro, M. M., & Morgan, J. R. (2013) *STEM Project-Based Learning: An Integrated science, technology, engineering, and mathematics approach (2nd Ed.).* Rotterdam, The Netherlands: Sense Publishers.

Dawson, P. (2014) "Beyond a Definition: Toward a Framework for Designing and Specifying Mentoring Models," *Educational Researcher,* 43 (3), pp. 137–145.

Hmelo-Silver, C. & DeSimone, C. (2013) "Problem-Based Learning: An Instructional Model of Collaborative Learning," In Hmelo-Silver et al. (Eds.), *The International Handbook of Collaborative Learning,* (pp. 370-386). Routledge: New York, New York.

Larmer, J. (2015, July 13) "Project-Based Learning vs. Problem-Based Learning vs. X-BL," *Edutopia.* <https://www.edutopia.org/blog/pbl-vs-pbl-vs-xbl-john-larmer> (Accessed February 1, 2021).

Mergendoller, J. (n.d.). "Does Project Based Learning Teach Critical Thinking?," *The Critical Thinking Consortium* <https://tc2.ca/uploads/PDFs/Critical%20Discussions/does_project_based_learning_teach_critical_thinking.pdf > (Accessed February 21, 2021).

Mergendoller, J. R. & Larmer, J. (2015) "Why We Changed Our Model of the '8 Essential Elements of PBL'," *PBLWorks.org.* <https://my.pblworks.org/resource/blog/why_we_changed_our_model_of_the_8_essential_elements_of_pbl> (Accessed February 21, 2021).

MEXT. (2012) Go Global Japan Project. Tokyo, Japan: Japan Society for the Promotion of Science. https://www.jsps.go.jp/english/e-ggj/index.html (Accessed February 21, 2021).

Morgan, J., Moon, A., & Barroso, L. (2013) "Engineering Better Projects," In Capraro et al. (Eds.), *STEM Project-based Learning: An Integrated Science, Technology, Engineering, and Mathematics Approach* (pp. 29-40). Rotterdam, The Netherlands: Sense Publishers.

Prince, M.J. & Felder, R.M. (2006) “Inductive Teaching and Learning Methods: Definitions, Comparisons, and Research Bases,” *Journal of Engineering Education,* 95(2), pp. 123-138.

Ravesteijn, W., De Graff, E., & Kroesen, O. (2006) “Engineering the Future: The Social Necessity of Communicative Engineers,” *European Journal of Engineering Education,* 31(1), pp. 63-71.

Suzuki, K. H. (2015) “OECD/Japan seminar – Japan’s educational reform for 2030”. <http://www.mext.go.jp/component/a_menu/other/detail/__icsFiles/afieldfile/2016/01/05/1365660_3.pdf> (Accessed February 21, 2021).

Thornberg, R., & Charmaz, K. (2014) “Grounded Theory and Theoretical Coding,” In U. Flick (Ed.), *The SAGE Handbook of Qualitative Data Analysis.* (pp. 153-170). London: SAGE Publications.

University of Louisville. (2016) “What is critical thinking?” <http://louisville.edu/ideastoaction/about/criticalthinking/what> (Accessed February 21, 2021).

メンターとファシリテーター：
課題探求プロジェクトの特殊目的のための英語の授業における役割

ヘネシー・クリストファー（福井大学）
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概要

2014年から2017年の３年間、日本の国立大学の語学部門と工学部が共同で３つの課題解決型学習（PBL）英語コースを開講した。受講対象者は建築建設学及び機械工学専攻の24名の学生であった。英語指導者、工学部教員、及び学生各々の役割と関係性を理解するため、筆者らは統一された定義が不在の「メンタリング」を概念化するため16のメンタリングデザイン要素を確認した Dawson（2014）、及び「ファシリテーター」を「内容に関する知識を提供するのではなく、学習と思考における有効な戦略をモデルとして示す専門学習者」であると定義した Hmelo-Silver and DeSimone（2013）を参考にした。本論文では、はじめにPBLコースの全体構成及び２名の英語指導者と４名の工学部教員の関わり方について、その概要を説明する。次に、Dawson による「メンタリング」の枠組み及び Hmelo-Silver and DeSimone によるPBL授業における「ファシリテーター」の定義を踏まえ、各々の指導者の異なる役割及び参加学生との関係性について説明する。最後に、これらの関係性をメンターとファシリテーターの文脈において理解し定義付けることが、今後PBLやアクティブラーニング型の授業やカリキュラムを作る上でいかに有用となり得るか、結論として所見を述べる。