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Adaptability to Problem-based Learning at Aalborg University

Experience from four first-year Chinese engineering graduate students

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Adaptability to Problem-based Learning at Aalborg University: Experience from four first-year Chinese engineering graduate students

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Abstract

The current trends in engineering education require new competencies that go beyond students' technical expertise. Among these skills, adaptability is regarded as one of the important skills as it indicates how engineering students approach changing circumstances. In general, this means to what extent engineering students are able to adjust to new learning methods and different social and academic environments. The transition into any university is generally known to create some difficulties for students. Problem-based and project-based learning (PBL) has been part of curricula over the past four decades at Aalborg University (AAU), and also here the transition process into the university can be challenging. Students usually transit into the university on two occasions, as undergraduates or as graduate. This paper focuses on the challenges encountered when adapting to PBL for international graduate students without prior knowledge and experience in PBL. In addition, these challenges are even larger for students from China due to the differences in culture, language, learning behaviours, conceptions of learning, and so on. From these perspectives, it is necessary to broaden our understanding of Chinese students' transition from lecture-based traditional learning and adaptation into a new problem-based and collaborative learning. Therefore, as an exploratory study, this paper aims at investigating what challenges first-year graduate Chinese students experienced when entering AAU and discussing the strategies they used in the adaptation process. Four first-year master Chinese students from different engineering departments participated in the semi-structured interviews and answered open-ended questions. The result showed that Chinese students face challenges in heavy academic workload, collaboration, communication and different assessment. However, making more efforts on study, clear groupwork division, good project management, inclusive and balanced team and effective communication we anticipate that this will help Chinese students to become better at adapting the Danish PBL context at AAU.

Keywords: PBL, Chinese engineering students, first-year graduate, adaptability

Type of contribution: PBL research

1 Introduction

Problem-based and project-based learning (PBL) is a promising and innovative education approach that has been widely implemented and remains the practice of engineering education at Aalborg University (AAU) in Denmark during the past four decades. This learning model not only focuses on students applying theory and knowledge in their work with a complex and real-life problem (Marra et al., 2014), but also specifies the principles of self-directed group work, student-centered learning, teacher as a facilitator, active-based

learning, exemplary practice and collaboration with peers or external partners (De Graaff & Kolmos, 2003; Kolmos et al., 2009). At AAU, this model is usually structured with a 15 ECTS project and three compulsory courses of each 5 ECTS. Within this frame, engineering students are required to formulate and analyze ill-defined problems, construct their own learning experience and interests, and collaboratively work in small groups on the common project (Kolmos et al., 2004). Furthermore, this model also provides students with the tools to independently acquire knowledge, skills and competencies in problem-solving, project management, cooperation, leadership, dealing with complexity and intercultural relation and being able to transfer across different disciplines. (Kolmos & De Graaff, 2015).

However, transiting from traditional lecture-based approaches to PBL methods may cause some challenges for international students, especially for Chinese learners as they possess different perceptions of teacher-student relations and understandings of learning. Influenced by the Confucian cultural heritage, Chinese learners are often described as passively accepting the knowledge and seldom challenging the teachers' authority and the validity of what they learn (Wang & Moore, 2007). In addition, according to various prior studies, some predominant views in Chinese learning can be summarized as being in favor of mechanical rote learning, teacher-directed and lecture-based learning, a belief that deep knowledge is acquired by memorization and repetition and the preference for individual learning (Gram et al., 2013; Huang, 2005; Wang & Moore, 2007). Under these circumstances, Chinese learning behaviors portrayed above are incompatible with the notions of PBL emphasizing project, active learning, student-centered and teamwork. When further exploring what differences and difficulties Chinese learners experience from the perspective of cross-cultural transition, research shows that some Chinese students from AAU are confronted with cultural differences in education for instance the direct teacher-student interaction in PBL at AAU (Du & Hansen, 2005). For the purpose of adapting to a new cultural environment, they also need to deal with more challenges than native students including language barriers, lack of interpersonal relations with team members, academic marginalization and social alienation (Gram et al., 2013). Psychologically, problems such as a sense of loss, rejection and confusion, stress, anxiety and even depression are adverse to the learning experience and the mental health of some international students in an unfamiliar educational setting (Brunette et al., 2011). After the completion of the three-year bachelor program at AAU, some native students continue their PBL studies at one of the master programs and regard their master in the first semester as the "7th semester". Compared to their Danish peers with prior PBL experience, the entry-level PBL Chinese learners may confront more first-year issues. Previous research has indicated that in the process of negotiation and integration to a new academic and social environment, some first-year ethnic minority students find it hard to build a sense of belonging, form students' identity and become a part of the community (Ulriksen et al., 2017).

Therefore, due to these difficulties, it is necessary to broaden our understandings on adaptability to a PBL model for first-year Chinese graduate engineering students. "Adaptability", also termed "adaptation", is defined as the ability for an individual to fit into a new environment by adjusting their thoughts, emotions and actions (Sirotiak & Sharma, 2019). In the context of PBL, it refers to engineering students being able to transfer their knowledge, theory and method from previously constructed areas to the new PBL educational setting and psychologically or socio-culturally integrate to the new society. As an exploratory research, this paper focuses on addressing the following research questions: During their first semester at AAU, what challenges do first-year Chinese graduate students face when they attempt to fit into the Danish PBL context? How - if at all - do they change their behaviors to be more appropriate?

2 Theoretical Framework

In an effort to answer the research questions outlined above, this study investigates first-year graduate Chinese students' adaptation processes by employing Berry's acculturation conceptual framework (2016). Initially, the concept of "acculturation" proposed at the group level refers to the cultural changes caused by interactions among two or more different cultural systems (see the left part of Figure 1). Furthermore, the

individual level is widely accepted to explain the psychological adjustment in an individual being affected by both the external culture(s) and the changing original culture(s) (see the right side of Figure 1).

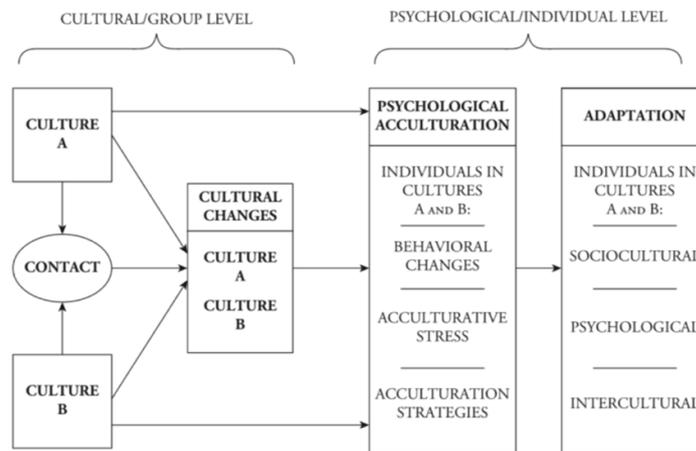


Figure 1 A general framework of acculturation process (Berry, 2016, p. 16)

In order to understand the acculturation at the cultural level, elements are presented to illustrate the acculturation process including culture A (heritage culture(s)), culture B (host culture(s)), the nature of the intercultural contact and the dynamic cultural changes between these distinct cultures. Although this framework uses the word “culture” at all levels, this study primarily concerns students’ adaptation to the culture in education. Specifically, in PBL, our research explores the experiences (contact) of students from previous learning culture in China (culture A) utilizing the PBL in the Danish context (culture B).

The dynamic interaction among all these components is taken to construct the starting point for and affect acculturation at the psychological level. Three acculturative outcomes, “behavioral shifts”, “acculturative stress” and “acculturative strategies” have been outlined under the psychological acculturation. The first term means that individuals change their behaviors to fit into new cultures. According to Berry (2016), these adjustments are achieved with minimal difficulties or problems. “Acculturative stress” refers to the psychological stress reaction in response to an incongruence of values, beliefs and cultural norms between an individual’s original culture(s) and host culture(s). During this process, individuals experience deeper changes to the extent of cultural conflicts. With reference to “acculturative strategies”, it means the multiple ways of acculturation among different groups of people. Four strategies to analyse individual acculturation are identified as integration (one wishes to maintain the original cultural identity and absorbs into the dominant culture(s)), assimilation (the individual fully participates in the new society and rejects their own culture identity), separation (one adheres to the heritage culture(s) but one does not integrate to the host culture(s)) and marginalization (one relinquishes both home and host cultures).

Resulting from the attempts to deal with the changes in psychological acculturation, three types of longer-term outcomes “psychological adaptations”, “socio-cultural adaptations” and “intercultural adaptations” are also presented in this structure. The first outcome is defined as “feelings of wellbeing and satisfaction during the intercultural adaptation” whereas the second means “the ability to fit in or to have an effective interaction with members of the host culture” (Zhang & Goodson, 2011). “Intercultural adaptation”, which is a notion that has come forth in recent years, refers to building practical relationships across cultural boundaries. In short, these three forms of adaptation have also been described as “feeling well”, “doing well” and “relating well” (Berry, 2016).

In conclusion, as an explorative research, the acculturation theory is utilized to explore the adaptive process of Chinese graduate students in the engineering field. Moreover, taking this structure into consideration, this study could contribute to understand Chinese international students’ adaptation to the PBL model. In the next parts, we will further look at the applications of these frameworks in a real setting

and investigate how these frames conceptualize PBL learning experience of first-year Chinese graduate engineering students at Aalborg University.

3 The research methodology

This research took the qualitative approach with the guidance of Berry's acculturation. Four Chinese engineering master students who were enrolled in the fall of 2020 at AAU participated in semi-structured interviews consisting of several open-ended questions. Three students came from different majors in the same engineering department while the last one came from another department (see Table 1). They did not get prior PBL experience from their bachelor. In table 1, all names are pseudonyms due to confidentiality of the participants.

Table 1: Description of the participants

Name	Gender	Department
Steven	Male	Electronics and IT
Ben	Male	Electronics and IT
Yvonne	Female	Electronics and IT
Joe	Male	Energy and technology

During the interviewing process, three students engaged in physical individual interviews whereas one student, Steven, used Wechat, a Chinese social media, to describe his experience. The participants were interviewed during the first half of their first semester, with each interview lasting approximately one hour. They were asked to narrate their expectations and the learning activities in PBL, the benefits and challenges they experienced in a new academic environment, approaches to overcome the difficulties and their evaluation of the learning outcomes. The first author conducted the interviews in Chinese because using participants' native language allowed them to fully express their own opinions. Then the descriptions from the participants were transcribed verbatim and translated into English.

Following the process of the thematic analytic approach (Braun & Clarke 2012), the transcripts were first read carefully and iteratively in order to familiarize the data. Based on the elements from Berry's acculturation theory, a set of temporary initial codes were generated where the experience of these students could be linked to adaptation. After the preliminary coding process was finished, the coded sequences were continuously revised until the overarching themes related to adaptive issues appeared. The themes were then analyzed and reviewed to see if themes and theoretical framework are related to the data. Finally, the analysis of data represented by the finalized themes were written up as a report.

4 Findings

The results from qualitative data reflected some major components of Berry's acculturation theory (2016).

4.1 Perceptions of prior learning experience in China (culture A)

The qualitative data revealed that all students mainly obtained knowledge through lectures and self-study. From their statement of prior learning experience, the lecturers highlighted the key topics that students need to learn and also transmitted a great amount of new information during the courses. Students kept listening to their lecturers, taking notes and memorizing the main concepts for their final written test but had little opportunity to apply the theoretical knowledge into practice. As Yvonne explained, in order to reflect on the knowledge that has been presented, she had to spend more time on self-study after the lectures.

"During my study for my bachelor's degree, I took the courses, made notes of what lecturers taught, finished my homework and had a cram session for the final exams. However, at that time, I felt taking

lectures was still not enough for me to understand what I learned. Therefore, I spent a lot of time on self-study.” (Yvonne)

In addition to taking lectures and studying on their own, the students also worked in small groups. However, they built a group in a very short period for some purposes such as discussing close-ended questions in the lectures or participating in some voluntary competitions which required to work in a team for submitting a program report within one or two months. According to Joe, the team was loosely-structured.

“When I was a bachelor student, there were some project competitions organized by the school and our teachers. Those projects required students to work in a group. However, they were not mandatory which meant students could drop out from these projects at any time.” (Joe)

4.2 Challenges of adapting to PBL (contact)

Although the students were enrolled in different master programs, we also find out some similar adaptive challenges consisting of heavy academic workload, challenges related to teamwork, language barriers, communication issues and pressure from assessment. Each of these challenges is elaborated below.

Heavy academic workload

In contrast to the academic workload in their bachelor, these new master students claimed to make more pre-course preparations within limited time. Joe mentioned that preview before a lecture benefited him to understand the lectures. But due to lack of time to read piles of literature, he normally took notes in the course first and tried to delve into more details after that. Under these circumstances, he spent longer time to figure out questions on homework but spent less time to do pre-course reading. Similar to Joe, in Yvonne’s case, due to change of the research direction in her master, she took more software lectures and was exposed to a lot of new knowledge. However, even though she spent extra time to prepare the course, it was still insufficient to go through and get familiar with all recommended literature, which gave rise to incomprehension to learning content and less participation in the group exercise.

“It seemed like a vicious circle that if I do not have enough time to read all references at the beginning, I need to spend more time to understand the learning content and finish my homework after the course. It further leads to a lack of time to look through references for the next courses.” (Joe)

“Due to time constraints, I was unable to read all the recommended literature before the course. During the lecture, I could only follow and understand the part that I already read. Then I stared into space for the rest of the lecture and occasionally caught one or two key words.” (Yvonne)

Another issue derived from the difficulty of exercise. Ben held a negative attitude towards the exercise which were mandatory but had no relation to the final assessment. He was reluctant to spend his spare time in completing those difficult exercise which would not be examined at the end of semester.

“I need to finish exercises for each course. That is to say, after every lecture, I would spend a lot of my spare time finishing those difficult exercises which actually caused a lot of study pressure on me. Now I feel more stressed than studying in China.” (Ben)

Challenges pertaining to teamwork

With more chances to collaborate with other students for the projects, these Chinese PBL beginners described that they faced a great deal of frustration in the process of teamwork. Because of distinct cultures, they experienced differences from their group mates in ways of thinking and views towards PBL. In Ben’s case, he participated in a group with five Danish students who had prior PBL experience. Ben regarded PBL as a flexible learning method to gain knowledge whereas he felt his groupmates had a narrow-minded interpretation of what PBL is and treated it as a rigid framework. As a result, he found it hard to integrate in his group by accepting his groupmates’ ways of doing the project. Furthermore,

because his group members had similar style of behaviors and team roles, he felt a lot of pressure to balance and coordinate his team.

“What my members understand of PBL is totally different from what I think. For me, I feel PBL is a method or a means of learning while they think PBL should follow what they did before, because this is what they learnt from PBL. Actually, I suffer a lot from this rigidity and have to strictly follow the procedures.” ... “Right now, we have six people in our group but five of them want to become a leader. It makes me feel more stressed to accomplish the project because I need to coordinate different ideas from different members.” (Ben)

In addition, three students reported that poor project management, inadequate time management and lack of common goals have negative impacts on group collaboration. These elements gave rise to inefficiency in PBL learning. Joe worked with two other PBL-beginner level students in the first graduate semester. Being unfamiliar with PBL and lacking project management experience, his group distributed tasks but finished them individually without knowing each other’s project schedule. Consequently, they found it took longer time to keep the same pace together. Ben pointed out that his group wasted time to roam around and chat for several hours in the group discussion, which increased procrastination and unproductivity to finish the final projects. Yvonne also stated that at the start of the semester, her team got lost in doing the project with no common goals and schedules.

“The poor project management makes our group lack information transparency. It means that, due to opaque workflows, our group members were unable to know what work and how much work that the others did at the beginning. Actually, it affected the overall productivity of our project.” (Joe)

“The group meeting lasted about two hours, but we only took half an hour to talk about some useful and effective information. Then, the other one and a half hours were spent on chatting.” (Ben)

“Without a schedule, one of my group mates often messed around and watched Youtube videos during our group work.” (Yvonne)

Language barriers and communication issues

All four students claimed that low English proficiency became one of the largest challenges in their learning process. Steven explained that due to unfamiliarity with the terminology in English, he took longer time to comprehend some basic professional knowledge in his field and give response to the others.

“The challenges and difficulties come from my English level because a lot of terminology I used before was taught in Chinese. Some things I want to say but I do not know how to express them in English. Meanwhile, I do not understand what the others say.” (Steven)

In terms of building relations with team members, Joe mentioned that owing to different languages and cultural backgrounds, it is much harder to find common topics and have deep conversation with native students compared to other international students from European countries. Moreover, his shyness interfered with asking for help from other native students even though he faced difficulties in adjusting to PBL.

“However, because of different language and cultural heritage, it is difficult for Chinese people to talk about gossip or anecdotes with Europeans. Even though we watch the same American TV series, we focus on different perspectives.” ... “Sometimes I asked questions to my classmates who had prior PBL experience but I felt too shy to ask all my questions or too many details together at one time. Therefore, I explored PBL by asking them only one question first and contemplating or searching for information on my own.” (Joe)

Pressure from different assessment

Three students reported that they were very anxious about the oral project exam. According to Ben, due to unfamiliarity with the exam and insecurity about the language proficiency, he felt stressed on his final exam.

“In fact, I am worried about my final exam, especially the oral exam. It seems horrible for Chinese students because doing a presentation within five or six minutes in English is a big challenge. In addition, the exam becomes uncertain if I do not understand the questions from the examiners.” (Ben)

4.3 Psychological reactions to PBL (Acculturative stress)

Based on what these Chinese students stated, the main mental challenges are centered on loneliness, isolation and lack of intrinsic motivation whereas the students benefit from developing a sense of belonging.

Loneliness and isolation

Since Chinese students studying abroad are without the company of their family, they often feel lonely and isolated living in a new environment. Due to the homesickness, even though they stay close to their friends and roommates, this does not necessarily solve the problem (Henze & Zhu, 2012). Yvonne said that a sense of loneliness resulted in a negative impact on her academic and social life in her first two months at AAU.

“Sometimes staying alone makes me feel bored and unhappy. This bad mood caused a large negative influence on my work. Hence, I had to adapt to the boredom and loneliness here.” (Yvonne)

Lack of intrinsic motivation

Another significant aspect of acculturative stress is lack of intrinsic motivation, which means that students lose their inherent enjoyment in PBL activities if they focus a lot on external rewards and requirements (Taylor et al., 2014). In Joe’s case, he evaluated himself to be result-oriented where his learning motivation derived from submitting the project in time, passing the tests and getting academic credits rather than from his natural interest in PBL.

“I found that I lack an intrinsic passion towards my project. Because I am more result-oriented, the only motivation I have towards my study at present comes from finishing my project work on time and getting enough credits to graduate. I feel I am obliged to do so.” (Joe)

Improved sense of belonging

In spite of feeling pressure from resolving some conflicts in teamwork, Yvonne reported that she gradually became cheerful to be accepted by her group. The inclusive and open-minded working environment encouraged her to ask more questions and express her own opinions freely.

“Our group looks like a family and every member is really nice. It made me feel accepted when they told me that if I had any questions, I could ask them and that there is no need to feel sorry to them when asking questions.” (Yvonne)

4.4 Behavioral shift to PBL

Despite the fact that the students pointed out the challenges mentioned above, they took different ways to deal with them. These ways assisted them better integrate to a new PBL environment. For example, when encountering pressure from heavy workload, they tended to work harder to endure hardship and cultivated their desire to learn. As what Steven stated, he became more self-directed and actively engaged with the knowledge he learned through putting more effort to studying.

“Compared to my bachelor studies, the self-study time is longer and I take more initiative to study. I spend more time on independently searching for useful resources related to my field and actively taking some relevant online courses.” (Steven)

When a problem was too large to deal with alone, these students chose to communicate with their groupmates and asked for their help. Good and effective communication will benefit them to deepen their understanding of new knowledge, resolve group conflicts, increase engagement to PBL and improve productivity of project work (Awang & Daud, 2015). Yvonne mentioned that asking questions to her groupmates helped her better understand the lectures and group exercise. Furthermore, from Joe's description, we learn that effective face-to-face talk enhanced the team cohesion and effectiveness of teamwork.

"If I constantly asked my groupmates some questions, I could catch up with the course and discuss with my team members as well." (Yvonne)

"After a group meeting on Friday, I decided to talk with my groupmates about the problems such as our slow project progress and lack of information transparency. I also pointed out our isolated group atmosphere and our self-centeredness. I told them we need a common goal instead of working individually and asking questions to the supervisor alone. That talk worked because our group atmosphere got much better than before, at least we discussed some problems together in our group." (Joe)

With reference to team collaboration issues, the ways to break down the barriers from these Chinese students can be summarized as creating balanced teams with different team roles, formulating clear work division and using effective management tools. Joe shared his experience about managing the project.

"We first made a schedule for our project and divided the work in our group. Afterwards, using some management tools, we strictly followed the schedule and also sent it to our supervisor who would help us revise our schedule. The feedback given by our supervisor assisted us to ensure weekly work and plans. Additionally, the schedule also allowed us to have enough time to finish the group project before the deadline." (Joe)

5 Discussion: Preferences of acculturation strategies

From the analysis of which acculturation strategy that these students choose, it should be noted that two students Joe and Yvonne selected the integration acculturation strategy where they actively engaged with PBL activities and meanwhile integrated experiences to the past. For example, in order to enhance the team cohesion, Joe used the coordinating strategies he learned from previous learning and working experience to cooperate with groupmates who were all PBL beginners. In addition, he improved his generic skills from PBL, which includes communication skills, collaboration skills, problem-solving skills and project management skills. These abilities will enhance his confidence to deal with teamwork problems in a real workplace. In Yvonne's case, a sense of responsibility got improved during the integration process. It means that she not only focused on her own learning process but also gave feedbacks on team's project schedules. Although PBL increased her willingness to make contributions in her teams, she was looking forward to taking more ownership by getting more respect from her groupmates. Steven's positive attitude towards PBL and relatively negative attitude towards traditional teacher-centered learning demonstrated that he primarily tended to adopt the assimilation acculturation strategy. On the one hand, learning through listening to teachers was not suited for his learning style and also failed to provide him intrinsic learning motivation. On the other hand, through in-depth investigation of authentic problems, PBL allowed him to apply acquired knowledge into practice, which improved his learning efficiency. In opposition to Steven, Ben leaned towards the separation acculturation strategy. He valued the style of collaboration in his bachelor with clear group work divisions and balanced team roles. Moreover, he was reluctant to build personal interaction with his groupmates and gained knowledge mainly through individual learning instead of group discussion.

6 Conclusion

Building on Berry's acculturation theory, this study investigated how first-year Chinese graduate students in engineering field adapt to PBL at AAU and the challenges they experienced during the adaptation process. The empirical data from the interviews reveal that rather than beginning with taking PBL methods in their undergraduate education, these students brought with them the traditional lecture-based and teacher-centered learning approach which they felt were at odds with the ways of thinking and acting in the PBL context. Although PBL radically shifted and expanded engineering students' understanding of education, students encountered some challenges and a sense of insecurity when trying to fit into the new PBL environment (Prosser & Sze, 2014). This study shows that during the adaptation process, first-year Chinese graduate students faced difficulties including heavy academic workload, language barriers, different ways of assessment, loneliness and isolation, reduced interpersonal communication with their team members and native students, which confirm some of the findings from previous research (Du et al., 2019; Gram et al., 2013; Henze & Zhu, 2012). In addition, it yields new findings of challenges related to teamwork and collaboration such as unbalanced team roles, poor project management and inappropriate time management, and lack of common goals which further leads to a decreased effectiveness of these Chinese students' learning through PBL. Psychologically, students' intrinsic motivation normally influences their internal satisfaction with learning (Taylor et al., 2014), but because of low intrinsic motivation, some participants in this study are reported to have less passion and interest towards their project work than their classmates from other European countries. In order to resolve these problems, this article demonstrates that the four first-year Chinese graduate students adopted integration, separation and assimilation acculturation strategies. None of these students exhibited marginalized attitudes and behaviors, which is in accordance with other studies in this field (Chen et al., 2008; Yu & Wang, 2011). According to the experience of behavioral shifts from these entry-level PBL learners, this research also suggests that making more efforts to study, clear groupwork division, good project management, inclusive group atmosphere, balanced team roles and effective communication help first-year Chinese graduate students transiting to the Danish PBL context at AAU. Finally, it should also be emphasized that PBL in turn serves as a driving factor to enhance students' communication, collaboration and problem-solving skills and develop them a sense of belonging and responsibility.

However, the results are subject to certain limitations. Firstly, because not many Chinese master students were enrolled at AAU in the fall of 2020, only four Chinese engineering students participated the interviews. Consequently, the small sample may not be sufficiently representative of overall Chinese first-year graduate students. Secondly, this study requires more rounds of interviews. Adaptation is a changing process that occurs over time and keeping track of the same students for a longer period of time would contribute greatly to deeper understand this process. Hence, it is recommended to include a larger sample and longitudinal data for future work. In terms of new research, it may be worthwhile to pay more attention to the changes of students' acculturation strategy selection during the adaption process and the adaptation experience of more international students.

7 References

- Awang, H., & Daud, Z. (2015). Improving a Communication Skill Through the Learning Approach Towards the Environment of Engineering Classroom. *Procedia - Social and Behavioral Sciences*, 195, 480–486.
- Berry, J. W. (2016). Theories and models of acculturation. In the *Oxford Handbook of Acculturation and Health* (pp. 15–28). Oxford University Press.
- Braun, V., & Clarke, V. (2012). Thematic analysis. In *APA handbook of research methods in psychology, Vol 2: Research designs: Quantitative, qualitative, neuropsychological, and biological*. (pp. 57–71). American Psychological Association.

- Brunette, M. K., Lariviere, M., Schinke, R. J., Xing, X., & Pickard, P. (2011). Fit to belong: Activity and acculturation of Chinese students. *Journal of Sport Behavior*, 34(3), 207–227.
- Chen, R. T. H., Bennett, S., & Maton, K. (2008). The adaptation of Chinese international students to online flexible learning: Two case studies. *Distance Education*, 29(3), 307–323.
- De Graaff, E., & Kolmos, A. (2003). Characteristics of Problem-Based Learning. *International Journal of Engineering Education*, 19(5), 657–662.
- Du, X., Ebead, U., Sabah, S., Ma, J., & Naji, K. K. (2019). Engineering students' approaches to learning and views on collaboration: How do both evolve in a PBL environment and what are their contributing and constraining factors? *Eurasia Journal of Mathematics, Science and Technology Education*, 15(11).
- Du, X., & Hansen, S. (2005). Confronting cultural differences: learning engineering as foreigners in a Danish context : a case study of chinese students. *VEST. A Journal for Science and Technology Studies*, 17(3-4), 61-84.
- Gram, M., Jæger, K., Liu, J., Qing, L., & Wu, X. (2013). Chinese students making sense of problem-based learning and Western teaching - pitfalls and coping strategies. *Teaching in Higher Education*, 18(7).
- Henze, J., & Zhu, J. (2012). Current research on Chinese students studying abroad. *Research in Comparative and International Education*, 7(1), 90–104.
- Huang, R. (2005). Chinese International Students' Perceptions of the Problem-Based Learning Experience. *The Journal of Hospitality Leisure Sport and Tourism*, 4(2), 36–43.
- Kolmos, A., Fink, F. K., & Krogh, L. (2004). The Aalborg model: problem-based and project-organized learning. In Kolmos, Anette : Fink, Flemming K.: Krogh, Lone (eds.) (Ed.), *The Aalborg model : progress, diversity and challenges* (pp. 9-18).
- Kolmos, A., De Graaff, E., & Du, X. (2009). Diversity of PBL-PBL learning principles and models. *Research on PBL Practice in Engineering Education*, 9–21.
- Kolmos, A., & De Graaff, E. (2015). Problem-based and project-based learning in engineering education: Merging models. In *Cambridge Handbook of Engineering Education Research* (pp. 141–160). Cambridge University Press.
- Marra, R., Jonassen, D., Palmer, B., & Luft, S. (2014). Why Problem-Based Learning Works: Theoretical Foundations. *Journal on Excellence in College Teaching*, 25, 221–238.
- Prosser, M., & Sze, D. (2014). Problem-based learning: Student learning experiences and outcomes. *Clinical Linguistics and Phonetics*, 28(1–2), 131–142.
- Sirotiak, T., & Sharma, A. (2019). Problem-Based Learning for Adaptability and Management Skills. *Journal of Professional Issues in Engineering Education and Practice*, 145(4).
- Taylor, G., Jungert, T., Mageau, G. A., Schattke, K., Dedic, H., Rosenfield, S., & Koestner, R. (2014). A self-determination theory approach to predicting school achievement over time: The unique role of intrinsic motivation. *Contemporary Educational Psychology*, 39(4), 342–358.
- Ulriksen, L., Madsen, L. M., & Holmegaard, H. T. (2017). The first-year experience of non-traditional students in Danish science and engineering university programmes. *European Educational Research Journal*, 16(1), 45–61.
- Wang, T., & Moore, L. (2007). Exploring Learning Style Preferences of Chinese Postgraduate Students in Australian Transnational Programs. *International Journal of Pedagogies and Learning*, 3(2), 31–41.
- Yu, W., & Wang, S. (2011). An Investigation into the Acculturation Strategies Of Chinese Students in Germany. *Intercultural Communication Studies*, 20(2), 190–210.
- Zhang, J., & Goodson, P. (2011). Acculturation and psychosocial adjustment of Chinese international students: Examining mediation and moderation effects. *International Journal of Intercultural Relations*, 35(5), 614–627.