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Best Practices of Team-Building Activities in a Project-Based Learning Class 'Design Project' in a Japanese Graduate School

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Abstract

To indicate the effective team-building activities implemented independently by the students in a project-based learning class in higher education in Japan, we conducted semi-structured interviews with the students of the Design Project class held at a Japanese graduate school in 2020 and 2021. The interviewees are 12 students belonging to the top three teams regarding the evaluation of the final presentation. Based on the classifications of the comments, we indicate the best practices of team-building activities corresponding to the timing and team characteristics.

Keywords: project-based learning, team building, design teams, teamwork, design education

1. Introduction

Team building has a positive impact on the teams' outcomes (Salas et al., 2005; Klein, 2009; Ekimova & Kokurin, 2014). According to Ashraf (2004), groups and group projects are becoming common in business schools across the U.S. as companies require their employees to be team players. One of the ways for students to learn team building in school settings but close to the 'real-world' context is project-based learning (PBL); PBL classes nurture 'twenty-first-century collaboration and communication skills' (Bell, 2010). Students have the opportunity to participate in real-world problem-solving and knowledge constructs in an authentic professional context through PBL (Guo et al., 2020). PBL is 'a student-driven, teacher-facilitated approach to learning' (Bell, 2010). Based on the three constructivist principles, PBL consists of 'the small group environment functions', 'the tasks required to complete the project function' and 'the sharing of individual knowledge through social interaction' (Cocco, 2006).

Kokotsaki et al. (2016) noted that PBL had been explored in different phases of schooling, ranging from elementary to higher education. However, only 20% (6 out of 30) of the studies reviewed by Chen and Yang (2019) were conducted in higher education. Most of the studies in higher education have focused on engineering education (Kokotsaki et al., 2016). According to Becattini et al. (2020), PBL 'aims at building engineering skills for students by confronting them with design problems that match their future professional profile (e.g. multidisciplinary projects to be developed in teamwork)'. Further practical studies are considered necessary for effective PBL in higher education. Regarding the school location, Chen and Yang (2019) indicated that the effects of PBL in academic achievement compared to traditional instructions were significantly greater in Europe, North America and West Asia than in East Asia. As for the reason for this result, Chen and Yang (2019) raised the issue of the intense competition at school and less practical experience of PBL in East Asia (especially in Taiwan). This study should contribute to PBL studies by dealing with a PBL class in a higher education school in East Asia, which has not received much practical PBL research so far.

In particular. this study focuses on effective team-building activities independently implemented by students participating in the Design Project class (DP) held at the Graduate School of System Design and Management, Keio University (Keio SDM) in Japan. The DP takes a two-phase project-based approach described as an effective approach in previous studies (Kukotsaki et al., 2016). In the first phase, the teachers help students to achieve a sufficient level of competence, and in the next phase, the students design and arrive at the solution independently. As the second phase relies on the students' autonomy, it is difficult to identify what is happening to the team. Therefore, the objective of this study is to clarify what effective team-building activities the students implemented independently and their timing through semi-structured interviews with the students of DP in 2020 and 2021. At the final presentation evaluation, we selected the top three teams to compile the best practices on team-building activities leading to better outcomes. We aim to open the black box of the practical team-building activities implemented independently by the students during the PBL class in higher education in Japan.

2. Research Background

2.1. Research on Team Building

Team building is an intervention designed to improve team functioning (Salas et al., 2005). Klein et al. (2009) define team building as 'a class of formal and informal team-level interventions that focus on improving social relations and clarifying roles, as well as solving task and interpersonal problems that affect team functioning'. Klein et al. (2009) described four components of team building; goal-setting, developing interpersonal relations, clarifying roles and creating additional capacity for problem-solving. We explore the team-building activities of the students without limiting them to the components indicated in the previous study.

In other words, team building improves the psychological climate wherein teams function (Beauchamp et al., 2017). Anderson and West (1996) proposed that the Team Climate Inventory (TCI) can be utilised as a team-building intervention. The TCI measures the team-level phenomena for innovation. It includes four climatic factors; participative safety, support for innovation, vision and task orientation. Loo (2003) utilised TCI as a team-building intervention and received comments from participants that they had a positive team experience during the team activity. In this study, we also focus on the team climate changes resulting from the team-building activities implemented by the team.

2.2. The Design Project at Keio SDM

Keio SDM provides education to develop people who can lead a large-scale complex system (Kohtake et al., 2010). The DP has been held as one of the core subjects for the first-grade master's students. The DP adopts the PBL structure since it is a practical programme to design solutions applicable to companies' real-world business or social problems. In 2020 and 2021, the DP class was held online according to the schedule in Figure 1.

	2020	2021
Learning Phase	April 11 Introduction April 25 Tool Exercise May 3 Group Work May 4 Group Work	April 7&10 Introduction April 24 Group Work May 3 Group Work May 4 Group Work
Active Learning Phase	May 9 Team member fix May 16 Group Work	May 8 Team member fix
Design Phase	May 23 Presentation 1/Feedback June 6 Presentation 2/Feedback June 20 Presentation 3/Feedback July 4 Presentation 4/Feedback July 18 Presentation 5/Feedback **August 2 Final Presentation**	May 22 Presentation 1/Feedback June 5 Presentation 2/Feedback June 19 Presentation 3/Feedback July 3 Presentation 4/Feedback July 17 Presentation 5/Feedback July 31 Presentation 6/Feedback **August 9 Final Presentation**

Figure 1. Design Project 2020 & 2021 schedule

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The DP is divisible into three phases; the learning phase, the active learning phase and the design phase.In the learning phase, students learn about the methodologies that can be used in each of the five boxes of programme framework shown in Figure 2, in which a value proposition was added to the framework indicated by Watanabe et al. (2017). The importance of iteration, i.e. going back and forth in the framework, is emphasised during the learning phase, and students will try to implement the learning in the active learning phase. Students will design the process by themselves to present a solution with new innovative values to the company at the design phase. We focus on the team-building activities at the design phase, which is out of teachers' control and has been left in a black box as to how it affects the team's outcomes.

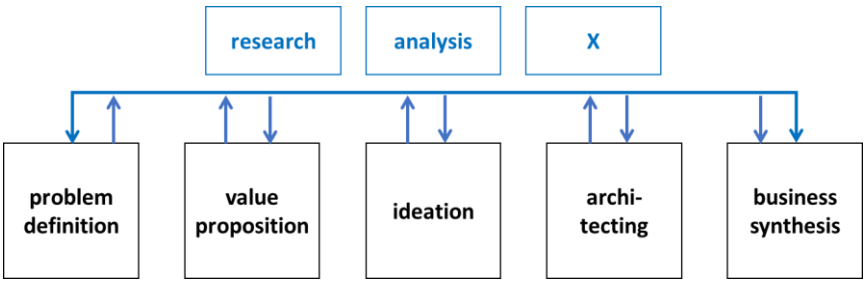

Figure 2. Programme Framework of Design Project (based on Watanabe, 2017)

Teams were formed after the learning phase. In total, 11 teams were formed with 64 students in 2020 and 12 teams with 64 students in 2021. Each student selected a proposer company based on their empathy for or interest in the topic presented by the company. In addition, they could decide the team by the line-up of team members since they can immediately confirm the candidates were raising their hands to each proposer company on an online whiteboard. Although team members are one of the very important factors that determine the outcomes of the four-month journey of DP, it is difficult for students to understand each other's characteristics in depth in less than one month, given their limited chances to interact with each other. Therefore, it is more important for students to build a team after the formation rather than select a team of the members they prefer. Also, the diversity of the team members makes team-building more difficult, but the expectations of the outcome are higher. Kurtzberg (2005) indicates that cognitive diversity is an important predictor of team emotions and outcomes. Since the students who enter Keio SDM are diverse in age (20s to 60s), gender and academic or career background, each team usually consists of diverse members.

Positive and significant correlations between team creativity and the evaluation of the final presentation at DP are indicated by Akaki et al. (2020). Since the team creativity scale (Zhou & George, 2001) is measured by the team members' voices leading to creativity, communication between team members affects the team's outcomes. Based on the inputs during the DP class in 2020 and 2021, students made efforts to build better communication within the teams. Students suggested reading about psychological safety as introduced by Edmondson (1999). Based on the collective intelligence factors (Woolley et al., 2010), students are told to speak out equally and not allow the conversation to be dominated by certain individuals. In addition, positive feedback is suggested to enhance the creative confidence of the team members (Kelly & Kelly, 2013). While making efforts to build better communication, students of DP decide independently what team-building activities to do and when.

3. Research Method

We conducted a semi-structured interview to clarify the team-building activities the top three teams implemented during the design phase. Two members from each of the top three teams in 2020 and 2021, in total 12 students, would be the interviewees. Two students from each team were selected based on the judgement by the main faculty that they could reflect the team activities objectively according to the descriptions in the individual reports. Two interviewees from each team were selected to present the team's activities but not to reflect an individual's perspectives or experiences. The top three teams were selected based on the evaluation of the final presentation by faculty members, students and proposer companies. Each stakeholder evaluated the solution, the problem definition and

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value to the users presented at the final presentation from multiple perspectives, such as understandability, novelty, innovativeness of the problem definition, creating new value in the world, innovativeness of the solution, preferences and passion for the solution.
Each interview was 40–60 minutes long and conducted online by two researchers. One researcher asked the interviewee questions, and another took objective verbatim notes. For students in 2020, the interview was conducted in January 2021, and for students in 2021, it was conducted in October 2021. Three questions were asked and analysed in this study.

1. How did the team climate change during the four months of team activities?
2. Did your team experience conflict? If so, how did you overcome it?
3. What kind of activities did you or your team implement for team building?

Questions were asked to compile a list of the best practices for team-building activities that lead to better outcomes. Team climate was asked about since it is the result of team building and is difficult to unearth through observations by outsiders of the team, especially in an online environment. The conflict was asked since team-building activities help students combat conflict, which functions negatively in the team (Salas et al., 2005). After conducting the interview, we analysed the result by classifying similar comments. Similar and specific activities implemented by each team can be clarified through the classification.

4. Interview Result

We collected 119 comments through the semi-structured interview with 12 interviewees in total. The comments were classified into the 11 categories explained in this section.

4.1. Teams' Characteristics

Twenty-two of the comments described the team's overall characteristics, including team climate and the diversity of team members, as shown in Figure 3.
Regarding overall team climate, two of the teams made efforts to keep a good climate inside the team (highlighted pink). Another two of the teams were relaxed and unhurried (highlighted blue). One team described themselves as businesslike, where efficiency was valued. One team felt that it was easy to get along with each other from the team's formation. This indicates that the teams were not all similar and had different characteristics in terms of overall team climate.
Regarding the diversity of the team members, all the teams except 20-b considered that the team members had a diverse background and consciously utilised this fact. Some teams had difficulties in utilising diversity effectively, while some did it well. Team 20-b focused more on the similarities than the differences between the members.

Team	Overall team climate	Diversity of team members
20-a	Two of the members tend to take leadership and others are sometimes passive. **Efforts** were needed to enhance the engagement of all members.	**Diverse background** including hometown and language. We valued the differences but difficult to utilise diversity.
20-b	For some reason, we **felt easy to get along with from the beginning** and throughout the process.	The average age was high. Most of the members were over 40. All the members prefer to work in teams.
20-c	**Businesslike mood**. A constrained online environment might affect the climate.	We made efforts to **utilize the diverse background** of team members.
21-a	All the members are quiet types of people (rare in this class). The team mood was **not too strict**, some members freely ate or slept during the work.	**Ages varied widely** from 20s to 40s. The youngest member with no work experience might find it difficult to speak out.
21-b	All the members are introverts. We liked the **loose and slow** mood of the team. We are good friends communicating every day. We even feel uncomfortable forming a team with other people.	Since all the members were working men and had commonalities, we **consciously utilised intra-diversity.**
21-c	The climate was stable and positive throughout the team activities. We discussed how we can prevent the breakout from the beginning of the team activity and **made efforts**.	**Very diverse members** but a nice combination. We often disclose what each member values.

Figure 3. Team's characteristics

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4.2. Team Climate Changes

When asking question 1, more than half of the teams commented on the first day of the team activity, what it was like when they fell into a slump and how they motivated each other at the final phase of the DP. Table 1 shows the number of comments.

Table 1. Classification of the comments about how their team climate changed (Q1)

Classification	Number	%
The first day of the team activity	13	56.7
Falling into a slump	5	21.7
Motivating at the final phase	5	21.7
TOTAL	23	100.0

Figure 4 sorts the main comments about how each team's team climate changed.
On the first day of the team activities, teams 20-a and 21-c focused on the discussions to understand each other in depth (highlighted pink). Teams 20-b and 21-a focused on progressing the team activities (highlighted blue). Two of the teams (20-b and 21-b) had a friendly mood from the beginning since they were able to find common ground easily.
All of the teams, except 20-b, experienced the feeling that they fell into a slump during the four-month journey. Teams 21-b and 21-c deliberately chatted longer to get over the slump (highlighted pink). The timing of the slump is at about the fourth round, which is two and a half months after the beginning, and team 20-a had already fallen into a slump after the first round. This result indicates that most of the teams fall into a slump during the journey even though they would be evaluated higher than other teams at the final presentation.
Teams 20-a, 20-b, 21-a and 21-c experienced a positive change during the final phase of the team activities. Team 20-b commented that the team activities progressed peacefully without a slump. At the final phase, they tried to focus carefully on the potential values for users that the solution could provide.

Team	First day	Fall into slump	Final phase
20-a	We shared the result of the personality assessment to **understand each other**.	After the 1st round finished, we talked about how open discussion is difficult for some members.	At the final two rounds, we became capable of doing better by understanding each other and could share the role effectively.
20-b	We decided the **ground rules** of the team activities.	-	We cherished the feeling of strangeness, especially at the final round.
20-c	We did nothing special on the first day and didn't know each other well at first.	At the 4th and 5th rounds, we were tired and split apart.	-
21-a	We discussed **how we would progress** the team activities.	During the 4th to 6th round, we felt ourselves on the decline. We struggled together.	Our team colour became clear and could work effectively unconsciously.
21-b	We could talk to each other honestly from the beginning.	When we felt the slump, we took a longer icebreak to relax. We liked **chatting**.	-
21-c	Each member shared why they had entered the graduate school, what the Design Project meant to them and their limitations.	We got used to the situation in the 3rd or 4th round and the time for **chatting** increased.	We wanted to get first place at the final presentation, so we dashed through the final phase.

Figure 4. Main comments about how their team climate changed (Q1)

4.3. Conflict Management

There were 23 comments answering question 2 about the conflict management of the team. The main comments are described in Figure 5.

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All the teams, except 20-b experienced some conflict during the process. 20-c tried to replace the negative complaints or exhaustive discussions with other things to avoid the conflict. 21-a, 21-b and 21-c commented that constructive conflicts, for instance, interrupting the discussions or doubts about the idea, are not complaints to individuals but necessary discussions and feedback to build the idea in the team (highlighted pink).

Team	Conflict Management
20-a	The conflict occurred when there were differences in skills or commitment and when some members were fascinated with a specific idea too much.
20-b	There was no conflict. We always struggled together. We reordered the discussions or dug deep into each other's ideas when necessary.
20-c	When there were complaints to individuals, we tried to replace them with complaints to the environment. We did not discuss exhaustively but voted when there were several ideas.
21-a	There were **constructive conflicts saying "no" honestly**. Not only negatives but we made positive feedback too.
21-b	We were in a negative mood when the members had different ways of thinking or when we were in the final stretch. We discussed that it is a good thing that we can **express ourselves honestly**.
21-c	Direct feedback for the team is **not a complaint to individuals**. We could interrupt the discussion anytime even when other members didn't have doubts.

Figure 5. Main comments about conflict management (Q2)

4.4. Team-Building Activities

Regarding the comments to question 3 asking about intentional team-building activities, there were five classifications of activities as shown in Table 2.

Table 2. Classification of the comments about team-building activities (Q3)

Classification	Number	%
Role-sharing in the teams	21	41.2
Self-disclosure	11	21.6
Optimistic communication	9	17.6
Rules about time and numbers of members for team activity	6	11.8
Sharing goals inside the team	4	7.8
TOTAL	51	100.0

Figure 6 sorts the main comments about five classifications in Table 2 by team axis.
It can be considered that role-sharing is an important factor since all the teams commented about it. Four of the teams consciously tried not to fix the role-sharing inside the team (highlighted pink). In particular, teams 20-a and 20-c shared leadership or facilitator roles equally inside the team. Since the DP is held in the education context, most teams value new experiences and learning rather than promoting the activities efficiently. Efficient role-sharing was especially needed when preparing presentation material. In addition, because teams had to present multiple times to the same proposer company, they needed a fresh way of thinking and actions to improve the presentation.
Self-disclosure was effective for team building and a way to discuss the solutions for teams 20-a and 21-c. They focused on what each member is interested in and applied it to the concept of the idea when others empathised with it.
Optimistic communication was impressive in teams 20-b and 21-a. They did not give up looking for a better solution by speaking encouragingly to each other.
Except for team 20-c, all the teams discussed the rules about timing or the manner of team activities. This result indicates that it is effective to discuss the rules of the team activities so that all the members can maintain their engagement with the team at an equal level.

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Teams 20-c, 21-b and 21-c shared the goal to receive a high evaluation at the final presentation (highlighted pink). Teams 20-a and 21-b considered the value to society beyond the DP class evaluation (highlighted blue). Teams 21-a and 21-c emphasised the value of the individual team members (highlighted green).

Team	Role-sharing	Self-disclosure	Optimistic communication	Rules	Sharing goal
20-a	Since two of the members tend to take leadership, we **intentionally shared the leadership role** taking turns.	We took a break every 30-40 minutes to talk about personal things like interests or hobbies. We decided the theme of the presentation from it.	-	All the members should participate in activities on Monday, Wednesday, and Friday. Turn on the camera during the team activities.	We considered the impact on society.
20-b	The role of each member was determined naturally after the 2nd round.	-	Everything will be okay in the end. When we got stuck, we reflected together.	Team activities were held in the morning. We made it a rule not to take off the camera during the activities.	We didn't have a fixed vision of the theme, so we could ideate freely.
20-c	Actively take roles base on each member's strengths. **All the members experienced the facilitation role** by taking turns every round.	-	We tried to create a light mood by laughing at silly things. Also, we intentionally communicated clearly on SNS groups.	We didn't define the rules clearly.	We emphasised understandability and empathy at the final presentation.
21-a	**We didn't share the role** consciously. We made the presentation together as well.	At the 3rd or 4th round, we naturally started to disclose our weaknesses.	We progressed the activities without leaving behind any doubts. It took time but we said let's try again tomorrow.	We did the team activities only when all the members could participate.	We emphasised team members' "love" for the solution.
21-b	One member was good at diverging ideas while another was good at converging ideas. The other two members were good balancers. The roles are fixed at the 3rd or 4th round. We shared the role of preparing the presentation too.	We used the icebreaker session at the start of the team activities to share how each member's day was in terms of work and daily life.	-	Although all the members were busy with work, we made it a rule that the team activities should be held when all the team members could gather.	We wanted the presentation to be evaluated by the audience. High evaluation is necessary to implement the solution in society.
21-c	We didn't intentionally determine the role-sharing but shared the role to prepare the presentations. Each member took a role that reflected their strengths, although one member pointed out that **we should take roles that we lack confidence in** to stretch our abilities for the team.	We gave each other feedback after every session. Feedback could be positive or negative. We also disclosed what we value to each other.	-	We shared the limitations in working with the team on the first day.	One member wanted to win the Design Project. We pursue what we have interests in.

Figure 6. Main comments about team-building activities (Q3)

5. Best Practices for Team Building

Based on the result of the semi-structured interview with the top three teams participating in the DP in 2020 and 2021, team-building activities corresponding to the timing and team characteristics could be indicated as best practices that individuals can refer to when starting the team activities in PBL classes.

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5.1. Team-Building Activities at Specific Timings

Three specific timings are important for team building: the first day, when the team falls into a slump and the final phase. Figure 7 shows the team-building points at specific timing.

Many teams commented about the first day as the starting point when answering about team climate changes. They shared and discussed between themselves how to progress the team activities for the rest of the period. Optimistic communication, which four teams raised as an intentional team-building activity, is useful to overcome the slump. Some teams utilised the icebreaker sessions and chatting effectively to build up their ideas. The changes in team climate turned out to be positive in the final phase for four of the teams. They resulted in effective role-sharing through struggles and shared goals within the team. It is important not to give up their trust in the team members and their goal.

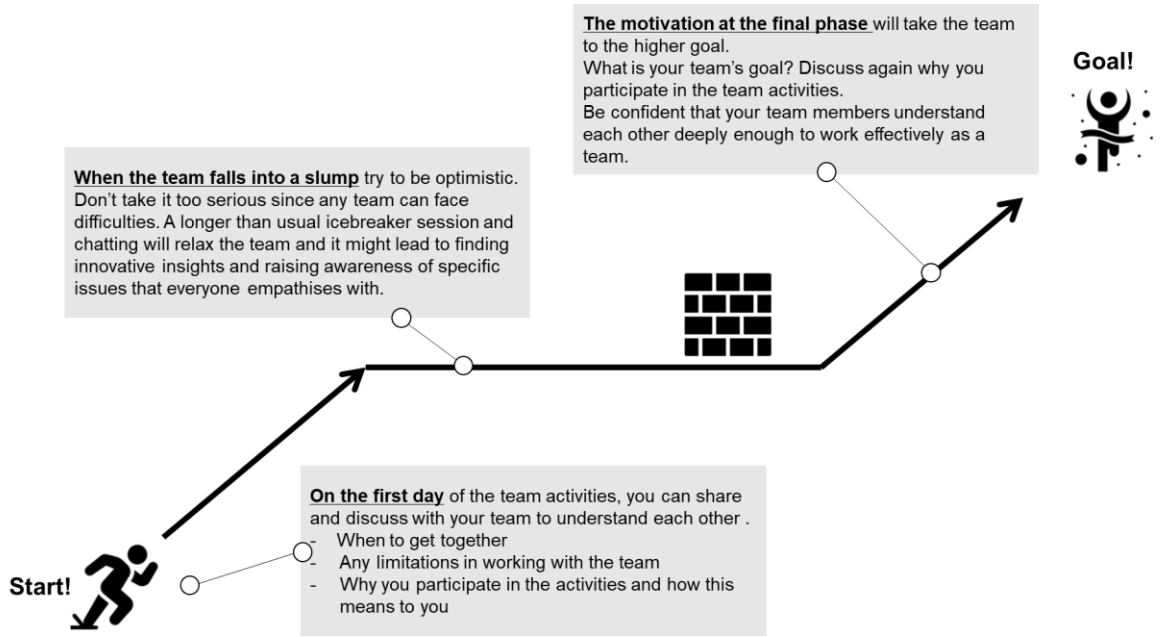

Figure 7. Team building points at the specific timing

5.2. Team-Building Activities Corresponding to the Team's Characteristics

Although the six teams interviewed have different characteristics, the teams can be classified into three types as shown in Figure 8: the diversity team, the businesslike team and the commonality team.

The first is the diversity team which includes teams 20-a. 21-a and 21-c. They noted the importance of utilising the diversity of the team members but also needed to make efforts to utilise this potential resource effectively. The team members shared the role instead of allocating it and supported each other to learn a new role to find each other's strengths. Diversity teams tend to experience conflict inside the team, but three of the diversity teams recognised that constructive feedback is not just complaints to individuals but necessary for the teams. What the diversity teams disclosed about themselves to understand each other was impressive and can lead to valuable ideas.

The second is the businesslike team, including team 20-b. Although only one team was classified in this category, some teams need time to communicate without over-consideration of each other. Since efficiency is emphasised in this kind of team and a lack of communication often occurs, role-sharing is an important factor in making the team activities progress. Regarding conflict management, not to overcome directly, but to take action to avoid conflicts is useful for them.

Finally, the third kind of team is the commonality team, including teams 20-c and 21-b. Team members focus on similarities in characteristics more than diversity, and role-sharing and conflict management are not difficult for them. However, since similarities may lead to narrow perspectives, it is important to dig deep into other members' thoughts in communication to open their minds.

Most of the team-building activities indicated in the best practices correspond to the components of team-building interventions as indicated by Klein et al. (2009) and the four climatic factors for

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creativity (Anderson & West, 1996). Many of the activities, including sharing and discussions to understand each other on the first day and self-disclosure, suggested to diversity teams the need to correspond to the component ‘developing interpersonal relations’ and the factors ‘participative safety’ and ‘support for innovation’. These activities aim to enhance further understanding and acceptance of each other.

Regarding role-sharing, all the teams commented on how they clarified each member's role within the team. Klein et al. (2009) indicated that role-clarification supports the team to function since it 'relieves stress as created by role-ambiguity or role-conflict'. Moreover, Belbin (1981) indicated that 'the effectiveness of a team will be promoted by the extent to which members correctly recognize and adjust themselves to the relative strengths within the team'. Although role clarification is commonly important, it can be considered that effective diversity teams did not fix the specific role-sharing inside the team since it takes more time to understand each other's strengths to utilise the diversity.

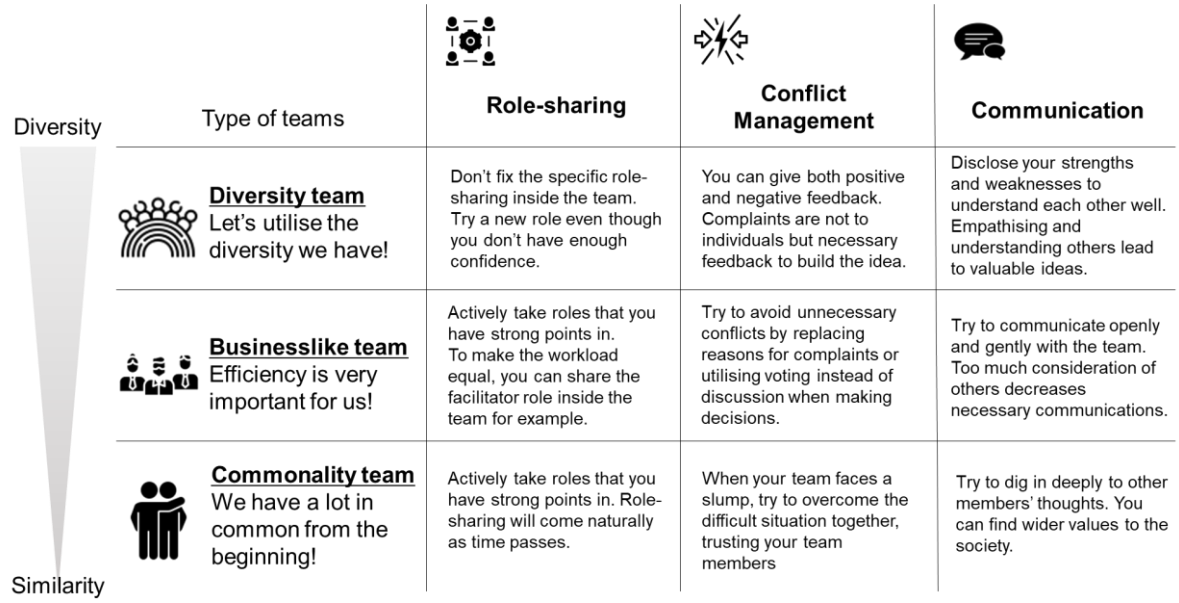

Figure 8. Team building points corresponding to the type of the team

6. Conclusions and Future Research

While the need for PBL is increasing these days, we have indicated the best practices in team-building activities that students can independently implement in a PBL class in higher education. Students can apply the best practices when participating in team activities in PBL classes for better outcomes. In particular, we clarified the activities implemented in the DP class held at Keio SDM in Japan.

To open the black box of when and what kind of team-building activities are implemented independently by the teams, we conducted semi-structured interviews with students belonging to the top three teams in 2020 and 2021. By classifying the comments collected through the interviews, we indicate two kinds of best practices corresponding to timing and team characteristics. Regarding the timing, three timings—the first day, when the team fell into a slump and the final phase—are specified to be the effective points to implement team-building activities. Also, the different activities for team building are suggested according to the three classifications of teams: the diversity team, the businesslike team and the commonality team.

Since this study focuses on actual actions by students, the limitation of this study is that the kinds of team-building activities described in the best practices are limited, relying on the students' knowledge, interests and motivation.

Future studies are expected to apply indicated best practices to other PBL classes or workplaces to experiment with its practicality. Although the best practices are compiled from school settings, they could also be applied to workplaces because PBL classes reflect real-world settings. In applying the best practices to the workplaces, it should be considered that they are compiled from equal relationship teams rather than hierarchical teams, which are often adopted in working teams. In that case, best practices for the businesslike team could be useful.

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References

Akaki, M., Kobayashi, N., Shirasaka, S., Ioki, M., (2020), "The Effect of a Method to Enhance Self-Acceptance and Acceptance of Others through Collaborative Team's Role Recognition", International Journal of Service and Knowledge Management, Vol. 4 No. 1, pp.76-95. https://doi.org/10.52731/ijskm.v4.i1.511

Anderson, N. and West, M.A. (1996), "The team climate inventory: Development of the tci and its applications in teambuilding for innovativeness", European Journal of Work and Organizational Psychology, 5:1, pp.53-66. https://doi.org/10.1080/13594329608414840

Ashraf, M. (2004), "A critical look at the use of group projects as a pedagogical tool", Journal of Education for Business, 79, pp.213-216. https://doi.org/10.3200/JOEB.79.4.213-216

Beauchamp, M.P., McEwan, D. and Waldhauser, K.J. (2017), "Team building: conceptual, methodological, and applied considerations", Current Opinion in Psychology, 16, pp.114-117. https://doi.org/10.1016/j.copsyc.2017.02.031

Becattini, N., Škec, S., Pavković, N., and Cascini, G. (2020), "E-Learning Infrastructure Prototype for Geographically Distributed Project-Based Learning", *Proceedings of the DESIGN 2020 / 16th International Design Conference, Online, October 26-29*, 2020, The Design Society, Glasgow, pp. 1667-1676. https://doi.org/10.1017/dsd.2020.282

Belbin, R. M. (1981), *Management Teams: Why They Succeed or Fail*, Heinemann, London.

Bell, S. (2010), "Project-based learning for the 21st century: Skills for the future", The Clearing House: A Journal of Educational Strategies, Issues and Ideas, 83, pp.39-43. https://doi.org/10.1080/00098650903505415

Chen, C.-H., & Yang, Y.-C. (2019), "Revisiting the effects of project-based learning on students' academic achievement: A meta-analysis investigating moderators". Educational Research Review, 26, pp.71-81. https://doi.org/10.1016/j.edurev.2018.11.001.

Thesis: Cocco, S. (2006), Student leadership development: The contribution of project-based learning, [Master Thesis], Royal Roads University, Victoria, BC, Canada.

Edmondson, A. (1999), "Psychological Safety and Learning Behavior in Work Teams", Administrative Science Quarterly, 44, pp.350-383. https://doi.org/10.2307/2666999

Ekimova, V. and Kokurin, A. (2015), "Students' Attitudes Towards Different Team Building Methods", Social and Behavioral Sciences, 186, pp.847 – 855. https://doi.org/10.1016/j.sbspro.2015.04.157

Guo, P., Saab, N., Post, L.S., Admiraal, W. (2020), "A review of project-based learning in higher education: Student ou comes and measure", International Journal of Educational Research, 102, 101586, pp.2-13. https://doi.org/10.1016/j.ijer.2020.101586

Kelly, T., Kelly, D. (2013), *Creative Confidence: Unleashing the Creative Potential Within Us All*, NY: Crown Business, New York.

Klein, C., DiazGranados, D., Salas, E., Le, H., Burke, S., Lyons, R., and Goodwin G.F. (2009). "Does team building work?", Small Group Research, 40 (2), 181-222. https://doi.org/10.1177/1046496408328821

Kohtake, N., Maeno, T., Nishimura, H., and Ohkami, Y. (2010) "Graduate education for multi-disciplinary system design and management -Developing leaders of large-scale complex system-", Synthesiology - English Edition Vol.3 No.2 pp.124-139

Kokotsaki, D., Menzies, V., Wiggins, A. (2016) "Project-based learning: A review of the literature", Improving Schools, Vol.19(3), pp.267-277. https://doi.org/10.1177/1365480216659733

Kurtzberg, T.R. (2005) "Feeling Creative, Being Creative: An Empirical Study of Diversity and Creativity in Teams", Creativity Research Journal, Vol. 17, No. 1, 51–65. http://dx.doi.org/10.1207/s15326934crj1701_5

Loo, R. (2003) "Assessing "team climate" in project teams", International Journal of Project Management, 21 pp.511-517. https://doi.org/10.1016/S0263-7863(02)00058-3

Salas, E., Priest, H. A., & DeRouin, R. E. (2005). Team building. In N. Stanton, H. Hendrick, S. Konz, K. Parsons, & E. Salas (Eds.)", Handbook of human factors and ergonomics methods (pp. 48-1, 48-5). London: Taylor & Francis.

Watanabe, K., Tomita Y., Ishibashi, K., Ioki, M., and Shirasaka S. (2017), "Framework for Problem Definition - A Joint Method of Design Thinking and System Thinking-", 27th Annual INCOSE International Symposium, Adelaide, Australia, July 15-20, 2017.

Woolley, AW., Chabris, C.F., Pentland, A., Hashmi, N., and Malone, T.W. (2010), "Evidence for a Collective Intelligence Factor in the Performance of Human", SCIENCE, Vol. 330, Issue 6004, pp. 686-688. https://doi.org/10.1126/science.1193147

Zhou, J. and George J. M. (2001) "When Job Dissatisfaction leads to Creativity: Encouraging the Expression of Voice", Academy of Management Journal, Vol.44, No.4, pp.682-696. https://doi.org/10.5465/3069410