



The Conflict Resolution Behavior of Interdisciplinary Teams for Promoting a Collaborative Design Process

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Abstract

Background As interdisciplinary collaboration in practice becomes an essential part of the design process for innovation, in-class design projects involving interdisciplinary teams are becoming more frequent to enhance the creativity and competence of collaborations. When working in a team with a range of expertise, conflicts during the design process are unavoidable. Since how to deal with conflicts influences team performance and the creative process, determining the conflict resolution behavior of interdisciplinary teams is required to promote a collaborative design process.

Methods For this study, an empirical study of eight interdisciplinary teams from different disciplines was designed. Protocol analysis was implemented to investigate the conflict resolution behavior of interdisciplinary teams. A retrospective interview was conducted to uncover further insights into interdisciplinary collaboration in design education.

Results This study identified the following conflict resolution behavior of interdisciplinary teams: Alternative, Persuasion, Different Perspective, Deferred Decision, Common Ground, Control, Defense, Avoidance, Competition, and Disinterest. The benefits and detriments of the conflict resolution behaviors and educational insights into the collaborative design process were discussed.

Conclusions This study suggests that how to resolve conflict will be utilized as educational resources for educators to facilitate the collaborative design process of interdisciplinary teams efficiently. What distinguishes this study from previous studies on conflict in cooperative teams is that it views conflict resolution as an important issue for improving the collaborative design process in the context of interdisciplinary design education.

Keywords Conflict Resolution Behavior, Interdisciplinary Teams, Collaborative Design Process, Design Education

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1. Introduction

As design in industry subsumes collaborative activities to work with marketing, R&D, and manufacturing, interdisciplinary collaboration has become an essential part of design education. When working in a team with diverse perspectives, conflicts will inevitably emerge in the design process (Cross & Cross, 1995). Good arguments from different perspectives will likely provide opportunities to combine diverse inputs that lead to innovation (Leonard & Sensiper, 1998). However, if a design team is unable to cope with conflicts appropriately, conflicts would disturb the team's performance (Brown 2013). Thus, conflict resolution is fundamental to successful collaboration. Conflict management has been considered an essential issue for successful collaboration because it impacts the effectiveness of the working process, relationships, and team satisfaction (Thomas, 1992; Behfar & Peterson, 2008). Among the previous studies on conflict in collaborative design, the following significantly focused on conflict resolution. Klein and Lu (1989) determined conflict resolution strategies of three groups of professionals in architectural design by analyzing their cooperative design processes. Badke-Schaub, Goldschmidt, and Meijer (2010) uncovered the relationship between cognitive conflict and innovation based on an empirical analysis of student design teams' idea generation processes. Both studies identified how a cooperative design team coped with conflict; however, neither focused on conflict resolution among a design team in the context of interdisciplinary design education. Since students are inexperienced in the field of design, their behaviors did not conform to professional behavior in terms of problem-solving strategies, design performance, or cognition (Cross, 2004). Thus, the nature of the students' conflict resolution behavior should be comprehended to help make their collaborative process more efficient. This study intends to demonstrate how interdisciplinary teams, who are inexperienced in collaborative design, perceive differences and resolve conflicts in the design process. Therefore, we constructed an empirical study of eight interdisciplinary teams at the undergraduate level to determine their conflict resolution behavior. A protocol analysis was conducted and educational insights into collaborative design was discussed.

2. Theoretical Background

2. 1. Conflict in Design Teams

Since the design process is complicated, involves ill-defined problems, and demands collaboration with different experts, conflicts, which are defined as disagreements among individuals, are unavoidable in design teams as they are part of the problem-solving process. Conflict among teams can be classified into three types: cognitive conflict associated with task-related issues, affective conflict involving negative emotions regarding interpersonal incompatibilities, and process conflict concerning planning and distributions of responsibility (Jehn, 1995; Badke-Schaub, Goldschmidt, & Meijer, 2010). Among them, cognitive conflict in particular relates to the creative process of design; cognitive conflicts resulting from different ideas and perspectives on task-oriented issues provide more opportunities to create innovative ideas (Badke-Schaub et al., 2010). On the contrary, affective conflicts decrease motivation and openness, and process conflicts reduce productivity (Amason, Thompson, Hochwarter, & Harrison, 1995; Jehn & Mannix, 2001). Because this study approaches collaborative design as a problem-solving process rather than a socio-emotional process, we focus on cognitive conflicts as contributory potential to promote effectiveness in the collaborative design process.

2. 2. Conflict Resolution Behavior in Collaborative Design

Collaborative design is described as a process that brings together participants from different disciplines who share their knowledge to achieve a mutual objective (Kleinsmann, 2006). In the collaborative design process, how to resolve conflict has been concerned as a critical issue (Klein & Lu, 1989). Brown (2013)

defines conflict as one of the ways to reach a shared understanding in the design process and describes how design teams in particular behave to resolve conflicts in the collaborative design process in the following ways. First, design teams try to persuade one person involved in a conflict to accommodate their counterpart's position. When one person is fully convinced of their counterpart's opinion, that person will accept their position voluntarily. Second, design teams attempt to find alternatives by revising or refining incompatible ideas iteratively. After an iterative idea generation process, design teams reach a compromise to resolve conflicts. Third, design teams try to see incompatible issues from a different perspective. The design process is moved forward by shifting the design teams' perspective. Fourth, design teams attempt to hold off making decisions when the team needs more information to determine incompatibility. Although a deferred decision can resolve conflicts for a while, this will create challenges in the later phase of design process. Finally, design teams try to return to common ground when the team recognizes that they have reached an impasse. By returning to the fundamentals, the design team can create a productive platform to re-explore mutually acceptable decisions. Based on the nature of conflict resolutions, this study determines the conflict resolution behavior of design teams as follows: Persuasion, Alternatives, Different Perspective, Deferred Decisions, and Common Ground (see Table 3 for examples of each behavior).

2. 3. Collaborative Design in Education

Since the essential concern of design education is to encourage students' capabilities to solve design problems and produce innovative artifacts, collaborative design is widely employed in design education to foster creativity (Kleinsmann & Valkenburg, 2008; Kim, Ju, & Lee, 2015). Students can move beyond their own perspectives and promote the capabilities of collaboration by sharing their knowledge about design content and the design process. However, if student design teams are incapable of dealing with conflicts appropriately, educational effects will be impeded during the collaborative design process. Thus, it is necessary to investigate how student design teams cope with conflict to support successful collaboration in design education.

3. Empirical Study

3. 1. Overview of the Experimentation

To identify the conflict resolution behavior of interdisciplinary teams, a protocol study was designed in a controlled laboratory setting. Eight interdisciplinary teams of 32 undergraduate students participated in the experiment. Considering that the field of design is actively associated with technology, business and human values, each team consisted of four members majoring in design, business, engineering, and humanities. Eight teams of four students each were equally assigned to interdisciplinary teams, maintaining same ratio for the team member's disciplines. To eliminate and prevent bias, verification was performed to ensure that the team members had never worked together prior to the experiment.

The design task assigned to the design teams was to propose a conceptual design that made studying at the university more fun for the students. The design task was designed to be ill-defined, challenging, and understandable within the participants' knowledge. Prior to conducting the task, the researcher provided instructions on how to conduct the design task followed by a question and answer session. All teams were required to solve the design task collaboratively within an hour and then spend a quarter of an hour articulating a design concept as depicted in Figure 1.

Each team managed their design process independently within the allocated time. Team communications were recorded completely and the verbal data were transferred to transcripts to capture their conflict resolution behavior. To investigate the benefits and obstacles in interdisciplinary collaboration, a retrospective interview was implemented separately at the end of the experiment.

Second, based on the coding scheme, as described in Table 2, the coders encoded conflict resolution behaviors separately. Some of the conflict resolution behaviors possibly do not fit into the classified behavior; therefore, the coding scheme includes an “Others” classification.

Table 2 Coding scheme for conflict resolution behaviors

Classification	Description
A. Persuasion	– Accepted the counterpart’s position voluntarily
B. Alternative	– Find a substitute iteratively – Modified or refined incompatible ideas
C. Different Perspective	– View the incompatibility from a different angle
D. Deferred Decision	– Determined to hold off on making a decision
E. Common Ground	– Go back to the fundamentals that everybody has in common
F. Others	– Unclassifiable conflict resolution behavior

Third, the researcher checked the reliability of the coding by testing the consistency between the two coders. The inter-reliability of the coding categories was .938. The two coders discussed the differences in coding to eliminate any vagueness and mistakes and then consolidated the data for analysis. Table 3 describes how the coders encoded for conflict resolution behavior.

Table 3 Example of protocols coded for conflict resolution behavior

Team	Time	Transcript	Conflict Resolution
Team 8	1:00	B: Why don’t we have one side of the wall made of glass? If we separate this space from the main area, the room will feel stuffy. E: But then I don’t see any difference between this space and the existing library. B: Okay, let’s make a separate room, then.	A Persuasion
Team 1	0:17	B: I think that is not a novel idea… E: Then how about making a garden inside the library? It’s related to the liberal environment that you have just mentioned. D: Or how about creating a place where students can both study and rest at the same time?	B Alternative
Team 1	0:05	D: I think that it doesn’t have to be something for on campus. We study on campus as well as outside for preparing exams, right? So, I think we should focus on making students studying more fun regardless of the study venue.	C Different Perspective
Team 1	0:13	B: Why don’t we consider some rewards for studying? What if students who study longer than others have a top priority for the registration? D: Well, it will be too harsh. Let’s make a decision later on after considering the ways to give a reward.	D Deferred Decision
Team 3	0:10	H: Students can adjust the temperature in several ways. E: But this is not related to making studying fun… What makes you fun when you are studying?	E Common Ground
Team 5	0:13	D: No, these ideas are not related to each other. B: No? I think they are related… E: Shall we just keep brainstorming?	F Others

* ‘D’ is the abbreviation for ‘design-major student’, ‘B’ is for ‘business-major student’, ‘E’ is for ‘engineering-major student’, and ‘H’ is for ‘humanity-major student’ for later use.

3.3. Data analysis

The conflict resolution behaviors of the interdisciplinary teams were analyzed in three ways. First, frequency analysis was conducted to identify their conflict resolution behavior. Second, unclassifiable conflict resolution behaviors were classified according to their content similarity. Finally, additional insights into interdisciplinary collaboration in design education were discussed based on the analysis of retrospective interview.

4. Result

4. 1. Analysis of Conflict Resolution Behavior

The most dominant conflict resolution behavior is “Alternative,” followed by “Persuasion”; meanwhile, the interdisciplinary teams seldom employed “Different Perspective,” “Common Ground,” or “Deferred Decision.” Table 4 describes the frequencies of the conflict resolution behavior for the eight interdisciplinary teams.

Table 4 Frequencies of conflict resolution behavior among the eight teams

Team	A	B	C	D	E	F	Sum
Team 1	3	7	3	1	–	1	15
Team 2	2	3	–	–	–	1	6
Team 3	6	12	1	–	1	1	21
Team 4	5	1	–	1	2	4	13
Team 5	11	3	–	–	–	5	19
Team 6	1	5	1	–	–	1	8
Team 7	1	8	–	1	–	2	12
Team 8	6	15	1	–	3	1	26
Sum	35	54	6	3	6	16	120

* A: Persuasion, B: Alternative, C: Different Perspective, D: Deferred Decision, E: Common Ground, F: Others

First, the design teams employed “Alternative” behavior most frequently to resolve conflicts; the teams tried to revise their conflicting ideas and propose substitutes iteratively to adjust incompatibilities. For instance, a conflict emerged in Team 8 while discussing appropriate form of a desk; the ideation lasted for a while until an acceptable idea was proposed. Table 5 shows how the teams activated the collaborative design process by validating and elaborating ideas through “Alternative” behavior.

Table 5 Example of “Alternative” behavior

Excerpt from Team 8 at 0:39–0:45
D: I think a square is the most convenient form for a desk.
H: But a square shape is not a creative form. How about adding unique colors to a square desk?
E: In terms of space efficiency, a rectangular desk is better than a square one. It would be more appropriate for using a laptop...
...
H: Well, I think that it might be inefficient for when I study alone. How about making a diamond-shaped desk?
D: Rotating a diamond turns it into a square. Why don't we make it square? It can be easily integrated and separated from each other.
H: Okay. Let's make it square.

Second, “Persuasion” behavior helped the design teams’ ability to achieve a shared understanding; accepting the counterpart’s position concluded the conflict. Based on a shared understanding of the subject of conflict, the teams could move their design process forward. Table 6 shows how conflict was resolved by employing “Persuasion” behavior in Team 5.

Table 6 Example of “Persuasion” behavior

Excerpt from Team 5 at 0:12–0:13
B: How about designing a school jacket?
D: I don't it is related to making students studying fun though.
B: Perhaps students would be more inclined to study if they wear a school jacket which is attractive to them.
D: Hmm... That could also be possible.

Third, the design teams in particular employed “Alternative” behavior subsequent to “Persuasion” behavior; when one team member involved in a conflict was fully convinced of a counterpart’s position, that person often tried to modify their conflicting idea immediately. Table 7 shows how Team 1 continued developing their ideas explicitly by combining the “Persuasion” behavior with “Alternative” behavior.

Table 7 Example of “Alternative” behavior subsequent to “Persuasion” behavior

Excerpt from Team 1 at 0:25

E: I like your idea itself, but I think it would be too complicated to design a new space and a smartphone application at the same time.

H: Well, I haven’t thought about that. Then, how about designing a cafeteria for study where students can enter only after leaving their smartphones at the entrance?

Fourth, “Different Perspective” behavior enabled the design teams to consider diverse possibilities. For instance, Team 1 confronted a conflict while developing their idea of redesigning the on-campus library, as described in Table 8. A design major student in Team 1 proposed a new approach to make studying more fun. Due to his new perspective, the team discussed a wide range of ideas that could make studying more pleasant for students.

Table 8 Example of “Different Perspective” behavior

Excerpt from Team 1 at 0:06

D: I think the term “fun” can be interpreted in two different ways: first, it conveys the creation of a pleasant study environment, and second, it represents discovering fun elements in relation to study.

Fifth, “Common Ground” behavior was employed when the design teams recognized that they could not reach a compromise involving the conflicts. Table 9 shows how Team 4 resolved the impasse and entered a new phase of the design process by sharing their personal experiences and knowledge. Despite incompatible conflicts, the “Common Ground” behavior revitalized the teams’ design process.

Table 9 Example of “Common Ground” behavior

Excerpt from Team 4 at 0:10

E: The best way to allow students to have fun is to eliminate exams.

D: Well, they would not study at all, then.

H: What we are doing is trying to make studying fun though. Let’s focus on discussing this subject.

Finally, the design teams employed “Deferred Decision” behavior when one person wanted to consider more before making a decision. For instance, although one person in Team 7 agreed with the idea of providing students with rewards, he decided to hold off until the teams could come up with more effective ways to distribute rewards. Through this, the design team alleviated their conflict for a while and elaborate their idea, as depicted in Table 10.

Table 10 Example of “Deferred Decision” behavior

Excerpt from Team 7 at 0:40

E: What if inducing students to study causes opposite effects?

What if students do not want to study without rewards?

B: Well, we should consider more about what could be an effective way to distribute rewards later on.

4. 2. Analysis of Unclassifiable Conflict Resolution Behavior

In total, 16 conflicts that were distilled from the experimentation were considered unclassifiable. According to their similarity, the unclassifiable conflicts resolution behaviors were clustered as follows: Control, Defense, Avoidance, Competition, and Disinterest. Figure 3 depicts the frequencies of conflict resolution behaviors that were newly uncovered from the experimentation.

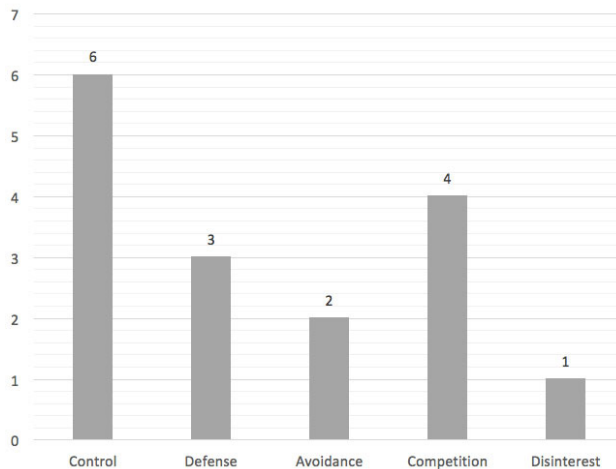


Figure 3 Frequencies of unclassifiable conflict resolution behaviors

First, “Control” behavior is exemplified by the one person in the team who attempts to suppress their team members’ argument. Unlike the results of “Persuasion” behavior, conflicts conclude without reaching a mutual agreement. For instance, when one person in Team 2 objected to the team’s idea on the grounds of its great expense, his argument was undermined by another person who argued that cost was not significant when proposing a conceptual design, as depicted in Table 11.

Table 11 Example of “Control” behavior

Excerpt from Team 2 at 0:20

B: But it will be too expensive to make it feasible.

H: Yes, but we do not have to think about the expense when proposing a conceptual design idea.

Second, “Defense” behavior protects a person instead of solving incompatibilities; objecting to the team’s idea often made design teams defensive. For instance, when one person in Team 7 pointed out that the proposed idea was unrelated to the subject, the other person involved in the conflict tried to protect himself rather than consider the problematic issue. Table 12 shows how “Defense” behavior hinder the creative process of finding substitutes or modifying the conflicting idea.

Table 12 Example of “Defense” behavior

Excerpt from Team 7 at 0:08

E: But it is not related to making studying fun.

H: Well, I just said what came to my mind.

Third, “Avoidance” behavior is displayed when the subject is changed immediately without any discussion when incompatibilities occur. For instance, when one person in Team 4 pointed out a problematic issue in the team’s idea, another person proposed a new idea promptly, as depicted in Table 13. Although this behavior, described as “Avoidance,” seemed to advance the design process, it made the team miss new opportunities to improve the current idea.

Table 13 Example of “Avoidance” behavior

Excerpt from Team 4 at 0:03

B: It would be fun if we install a slide or an escalator in the hills.

E: But, how can we get off in the middle of the slide?

H: Then, shall we change our subject to designing a new curriculum?

Fourth, “Competition” behavior is to prefer different ideas obstinately. In Team 5, when two team members each asserted their own perspective; they gave no specific reasons for their claims, and so the conflict decrease team performance, as described in Table 14. To make the collaborative process more efficient, “Competition” behavior should only be encouraged when conflicting parties claim rational arguments.

Table 14 Example of “Competition” behavior

Excerpt from Team 5 at 0:13

D: I think they are totally unrelated to each other.

B: Unrelated? I think they are somehow related to each other.

Fifth, “Disinterest” behavior is a display of indifference in regard to finding a resolution for conflict. When one person in Team 5 pointed out that the idea’s scope was too broad to implement, another person was unconcerned with making a decision and handed over his power of decision to the others, as described in Table 15. Although the interdisciplinary teams seldom used “Disinterest” behavior in the design process, it is an unhealthy way of dealing with conflict since it hinders the decision-making process.

Table 15 Example of “Disinterest” behavior

Excerpt from Team 5 at 0:39

D: However, what we are going to design would be too broad to Implement, wouldn't it?

E: I don't care whether it is be feasible or not.

4. 3. Retrospective Interview

After experimentation, each participant was questioned about the benefits and difficulties of conflict resolution behavior during the collaborative design process. The significant findings from the interview were described as follows.

First, the participants learned new ways to approach design problems from each other while resolving conflicts. For instance, a humanities-major student reported that it was impressive how they could solve conflicts with respect to the design problem in practical terms, unlike the process to which she was accustomed. In addition, a design-major student stated that it was valuable to approach design problems rationally, whereas she was used to concentrating on visualization. Considering that design teams discover diverse ways to solve design problems themselves, interdisciplinary collaboration provides opportunities for students to be self-directed learners.

Meanwhile, interdisciplinary teams had difficulties resolving conflicts caused by different understandings of design terminologies. The most remarkable difference between team members was how they recognize the notion of design; the engineering-major students limited their designs to production to create tangible artifacts, whereas the design- and business-major students regarded designing from a macro perspective by including planning, product creation, and even proposed services. For instance, Table 16 shows how conflicts arose consecutively in Team 5 and hindered the collaborative design process. Because each member of the team viewed the concept of design differently, the conflicts re-emerged until the engineering student was persuaded by the business student’s argument. Considering that disparate viewpoints on the idea of design will bring a series of conflicts in collaborative design processes, it is necessary to educate interdisciplinary teams to create a shared understanding on the concept of design; this will prevent interdisciplinary teams from wasting time resolving the conflicts and consequently increase team performance.

Table 16 Example of conflicts caused by disparate viewpoints on design

Extract from Team 5 at 0:27–0:33

E: Wait a minute, I am a little bit confused. Design is creating something like a desk or a chair, right?
D: Well, you are talking about a specific type of design. The scope of design is broader than you think.
E: Yeah, you're right. It could be...
...
B: Do we have to visualize something in detail?
E: Yes, we have to make something tangible.
D: Don't you think that creating a smartphone application is design?
...
B: I think creating a platform can be a part of the design.
E: Do you mean designing is planning? Hmm, if we are going to make a smartphone application, then do we have to design an interface showing loading images or something like that?
B: Planning is also a part of design, but I think it will be alright to propose the idea alone.
E: Okay, now I understand.

Finally, interdisciplinary teams had difficulties in the collaborative design process due to their different educational backgrounds with respect to collaboration; students majoring in engineering and humanities reported that they were used to conducting assignments alone instead of working with a team, whereas students who majored in design and business stated that they were used to working on school projects with a team. Improving the collaborative design process requires providing more opportunities to work with students from different disciplines in education.

5. Discussion and Conclusions

This study's major contribution is that it provides a comprehensive understanding of the conflict resolution behavior of interdisciplinary teams in the collaborative design process within the context of the educational environment. Unlike previous studies on conflict resolution in collaborative design, this study focused on investigating how undergraduate teams who are inexperienced in collaborative design coped with conflicts and uncovered new conflict resolution behaviors such as "Control," "Defense," "Avoidance," "Competition," and "Disinterest" along with the following behaviors extracted from the literature: "Alternative," "Persuasion," "Different Perspective," "Deferred Decision," and "Common Ground." This is significant in design education since the advanced capacity to work with others influences the efficiency and effectiveness of collaborative design processes (McDonnell, 2012).

On the basis of empirical study, the benefits of conflict resolution behaviors with respect to the collaborative design process are identified as follows:

- The empirical analysis of this study shows that "Alternative" behavior enables interdisciplinary teams to transform conflict into new ideas; the interdisciplinary teams tried to modify, or find another option when team members clashed on the proposed ideas. As Verganti and Norman (2019) demonstrate, criticism stimulate ideas. "Alternative" behavior shows contribution potential in fostering students' capabilities in divergent thinking.
- "Persuasion" behavior followed by "Alternative" behavior played a constructive role in the problem-solving process; when interdisciplinary teams accepted some problematic aspects of the proposed idea, the subsequent "Alternative" behaviors set a creative platform in which teams could find new opportunities to overcome the problem. This is significant in collaborative design processes since the central issue in design education is to encourage students' innovative capabilities (Clemons, 2006; Kim et al., 2015).
- "Different Perspective" behavior enabled interdisciplinary teams to consider a wide range of possibilities to solve a design problem. This is valuable since the teams reach a shared understanding effectively while comparing and reconciling different perspectives (Amason et al., 1995).
- Although the interdisciplinary teams seldom employed "Common Ground," and "Deferred Decision," both conflict resolution behaviors are beneficial to boost efficiency in the design process because

teams continue their design process by breaking the impasse. Furthermore, returning to the fundamentals everybody agreed upon enabled teams to clarify their design direction.

- “Control” behavior enables interdisciplinary teams to save time and be more productive in concluding conflict. When a conflict was brought up by anyone in the design team who was unclear about the proposed idea, “Control” behavior allowed the design process to move on to the next phase. However, “Control” behavior may restrict divergent thinking and decrease team performance; thus, it should be recognized that “Control” behavior has two sides to the collaborative design process.

Based on the obstacles identified from this study, educational insights on how to facilitate the collaborative design process of interdisciplinary teams in an educational context are described as follows:

- In the empirical study, it was revealed that interdisciplinary teams at the undergraduate level mostly employed either “Alternative” or “Persuasion” behavior to resolve conflict. It implies that the undergraduate participants who were inexperienced in collaborative design processes may not be fully aware of how to reach a shared understanding. Considering that how to deal with conflicts was an essential part of improving the collaborative design process, the role of the facilitator who suggests diverse ways to resolve conflicts is required for effective collaboration (Klein & Lu, 1989). For instance, when interdisciplinary teams could not find any substitutes and were stuck in an impasse, a facilitator may lead the teams to employ “Different Perspective,” “Deferred Decision,” or “Common Ground” behavior to move the collaborative design process forward. Managing conflict appropriately will contribute to the effective collaboration process, and the quality of outcomes (Amason et al., 1995; Valkenburg, 2000).
- During the retrospective interviews, it was uncovered that a design major student felt burdened when team members from different disciplines depended on her. If students had been exposed to collaborative design more frequently in their interdisciplinary education, their capacity to collaborate would have been improved.
- In the empirical study, it was uncovered that interdisciplinary teams were often defensive in that they would regard conflict as personal assaults. As Verganti and Norman (2019)’s research on innovative projects indicate, effective teams expand the flow of creativity through criticism; the role of conflict is to validate and elaborate ideas (Brown, 2013). Thus, it is significant to create positive and constructive environment by informing interdisciplinary teams of how they might significantly confront conflict in the design process to provide opportunities to verify new ideas, and to create innovative results.
- It was discovered that provoking winning and losing situations caused “Competition” behavior which hindered collaborative design processes. When conflict becomes competition, a facilitator should intervene in the process and lead the teams to provide constructive feedback on the counterpart’s arguments and explore alternative ways to reach a compromise. Fruitless conflicts are counterproductive to the collaborative design process (Brown, 2013).
- In the experiment, it was observed that conflict emerged relatively less in Team 2 and Team 6. Considering that good arguments encourage the teams to seek new ideas to move beyond the team’s mindset, it is required to encourage the teams to dive deep into a current idea for the collaborative problem solving process (McDonnell, 2012; Verganti & Norman, 2019).

This study shows the benefits and detriments of conflict resolution behaviors in interdisciplinary teams. This is beneficial in supporting the collaborative design process since unresolved conflicts re-emerge in the latter phase of a design process until an acceptable conclusion can be reached (Cross & Cross, 1995). Based on the conflict resolution behavior of interdisciplinary teams identified from this study, educational programs and methodologies should be developed for future research.

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