THE SYSTEMATIC FEEDBACK METHOD FOR IDEATION MODE IN WORKSHOPS

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ABSTRACT

To encourage creativity through ideation mode in design thinking, we conducted three workshops dealing with regional challenges with 44 participants. The systematic feedback method applied to the workshops supports the multi-disciplinary participants to feedback during the ideation mode to diverge ideas from diverse perspectives. The method is composed of feedback cards and the process of using them. Two kinds of cards encourage communication within the team. The next three cards aim to diverge the viewpoints of the feedback systematically to support the team to imagine the possibility of the idea evolving from a bird's eye view.

Through quantitative analysis of the survey, we identified the significant and positive correlations between acceptance of the team's idea and team creativity, the effectiveness of the method on team creativity, and the team's characteristics that firmly realized the effect of the method. By categorizing the free comments, we indicated the valid functions and improvements that need further research in the future. Identified valid functions were not only diverging minds and perspectives but encouraging communication and understanding of the team members leading to acceptance and creativity.

Keywords: Creativity, Collaborative design, Communication, Design methods, Design learning

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Cite this article: Akaki, M., Maeno, T. (2023) 'The Systematic Feedback Method for Ideation Mode in Workshops', in *Proceedings of the International Conference on Engineering Design (ICED23),* Bordeaux, France, 24-28 July 2023. DOI:10.1017/pds.2023.353

1 INTRODUCTION

1.1 Design thinking and creativity

Creativity is the first step to innovation (Amabile et al, 1996; Mumford & Gustafson, 1988; West, 2002). According to Rank et al. (2004), creativity focuses on idea generation and innovation focuses on the implementation of ideas. One of the ways to stimulate creativity to generate ideas in multi-disciplinary groups is design thinking. Lee et al. (2019) indicated that "factors emphasized in design thinking can facilitate factors necessary for promoting group creativity (e.g., effective interactions, collective reflection, and sharing goals within teams)". Also, Rauth et al. (2010) indicated that design thinking "offers a way to further develop the different mindsets needed to build creative confidence".
Referring to d.school at Stanford University's five modes of design thinking, we focused on ideation mode, which is a process to generate ideas, in particular, "explore a wide solution space- both a large quantity and broad diversity ideas". (Doorley et al. 2018) It is important to diverge ideas from diverse perspectives and team members can support each other through collaboration within the team.

1.2 Feedback during the ideation mode

For the purpose to encourage creativity by learning and implementing design thinking, we designed a design thinking workshop promoting systematic feedback inside the teams during the ideation mode.
Hoever et al. (2018) identified positive feedback contributes to divergent insights that can lead to creativity. De Stobbeleir et al. (2011) indicated that feedback-seeking is a proactive behavior for achieving creative outcomes. Gong et al. (2019) observed a positive association between a co-worker feedback environment and creativity. Akaki & Maeno (2022) identified the moderation effect of acceptance of ideas between feedback and team creativity. Also, acceptance of ideas itself had a strong effect on team creativity.
This study aims to design and evaluate the systematic feedback method that teams can use during ideation to diverge the ideas that individual members generated, which are converged by the team to prototype at the next step. As the method, we designed the feedback cards and the process to use them. Perspectives to feedback are described on each card. After generating the ideas, each participant will receive feedback from team members with feedback cards in their hands. By offering feedback from diverse perspectives, we seek the teams to deeply understand each other's idea and accept it. As the quantitative analysis by Akaki & Maeno (2022) indicated, we hypothesize that the acceptance of ideas promoted by the method enhances team creativity. In addition, as Yoon et al. (2010) indicated a strong correlation between team creativity and team performance, we hypothesize that stronger acceptance and team creativity will lead to higher evaluation of generated ideas. This is in line with Akaki et al. (2022) indicating that teams that received high evaluations could manage conflict by conscious feedback to each other to evolve their ideas.

1.3 Ideation mode in workshops

We applied the method to opportunities to conduct three workshops, which purpose is to generate ideas to solve regional problems by learning and implementing design thinking. There were 44 participants and nine teams in total. Although the three workshops and the participants had different backgrounds, we commonly used the systematic feedback method in the ideation mode and evaluated its effect quantitatively and qualitatively.
We evaluated the method from three points. First, we analyse the relationship between acceptance, team creativity, and evaluation of ideas. Secondly, we aggregated the survey data asking about the effect of the method on team creativity. Classification of free comments and interviewing with the supporter of a specific team deepened the discussion of the method's valid functions and improvements for the future. Finally, we conducted a correlation analysis to indicate the team's characteristics that realized the effect of the method on team creativity.
The remainder of the paper is described to answer the following questions.

1. Are the team's creativity and evaluation of the generated ideas strengthened by encouraging acceptance of ideas using the method?
2. What are the effectiveness and the valid functions of the systematic feedback method?
3. What are the characteristics of the teams that realised the effect of the method on team creativity?

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2 RESEARCH METHOD

In this section, details of the design thinking workshops and the systematic feedback method are indicated. We held three design thinking workshops with 44 participants in total to evaluate the method.

2.1 Overview of the design thinking workshops

Figure 1 shows the process of the workshops. Workshops were designed based on d.school at Stanford University's five modes of design thinking. Since workshop 1 (W1) was three hours one-day workshop, we focused on ideation excluding prototyping & test. On the other hand, day 2 of workshop 2 (W2) was focused on prototyping & test leading to the implementation of ideas after the workshop. This is because W2 was the kick-off workshop of the specific living lab and the prototyping process is especially important for living labs (Schuurman et al. 2016). As the participants joined from different regions, W3 focused on the empathize mode to understand the regional challenges deeply on day 1 of conducting interviews with participants who have specific problems that needed to be solved. Although each workshop had a different background, the ideation mode was designed utilizing the systematic feedback method.

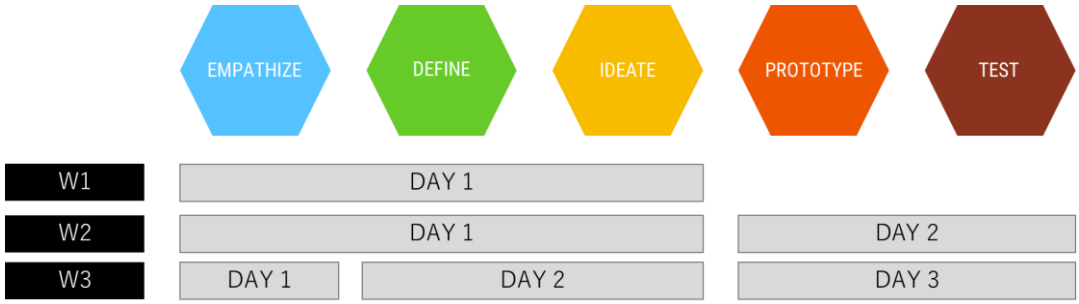

Figure 1. Design thinking modes and the design of the workshops

2.2 Design of the systematic feedback method

We designed the systematic feedback method to diverge the ideas that the individual members generated during the ideation mode. To support the person to give feedback (feedbacker) on 'how' to communicate systematically what they felt or thought listening to the idea, we designed the guide and feedback time in Figure 2.

Referring to Gong et al. (2019) indicated the importance of a co-worker feedback environment, attitudes when giving feedback are indicated before starting the feedback time inside the teams. To enhance the recognition of the implicit biases towards creativity to reduce the uncertainty that prevents creative ideas (Mueller et al., 2012), we added the description of biases.

At the feedback time, five cards are handed to the feedbackers. Each card is designed based on theories. Two kinds of cards prevent feedbackers to feel pressure to say something very effective and encourage communication within the team. The first card asks the feedbacker to openly tell positive emotions. This is because Hoever et al. (2018) indicated the effectiveness of positive feedback on creativity. The second card asks to give questions to confirm their understanding of the idea. This card lowers the hurdle to giving feedback since feedback is a proactive behavior that the receiver can seek to gain (De Stobbeleir et al., 2011). The next three cards aim to diverge the viewpoints of the feedback systematically to support the team to imagine the possibility of the idea evolving from a bird's eye view. The third card diverges the viewpoint from the 'time' and the fourth card from the 'space' viewpoint (Industry IoT Consortium®, 2022). Finally, the fifth card reminds the feedbacker the human-centered design, which is an important aspect of design thinking. The feedbackers tend to feedback from their viewpoint, but the fifth card strengthens the viewpoint of the user.

At the feedback time, about five minutes per person are used to present the idea and receive feedback from team members, therefore, about 25 minutes are needed when there are five members in the team. However, the feedback time needed to be extended when there are many feedbackers. Team members take turns to present and receive feedback. When the turn comes, the presenter will deal all the cards

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to feedbackers. For example, when there are three feedbackers, two of them will give feedback using two cards. We set this rule to ensure all the members receive feedback using all five cards.

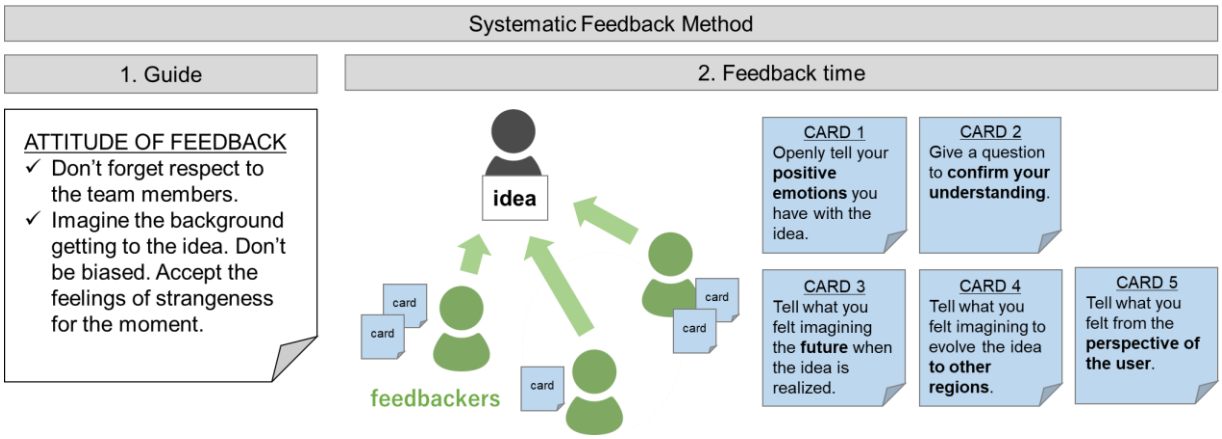

Figure 2. Design of the systematic feedback method

Figure 3 shows the process of ideation mode in the workshop including before and after the systematic feedback method. After the individuals converge on the idea, the team support diverging the idea with the method. After individually reflecting on the feedback, the team discusses converging on an idea as a team leading to prototype mode.

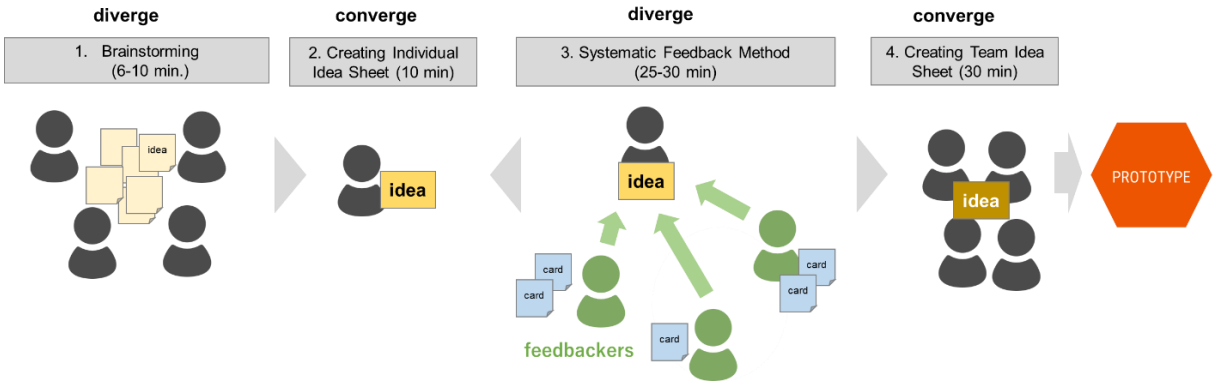

Figure 3. Process of the ideation mode workshop

2.3 Survey items

We conducted mid and post-survey after each day of the workshops. Table 1 shows the items of the survey. We analysed the survey from three perspectives.

We analysed the team variables and evaluation of ideas in order to find out how acceptance affect Team Creativity (Zhou et al., 2001) and evaluation of generated ideas. Team Creativity items ask about the behavior of team members leading to creativity. Regarding acceptance, we asked from three perspectives; the respondent's acceptance of other team members' ideas, team members' acceptance of the idea that the respondent presented, and the team's acceptance of ideas that converged. Also, generated ideas were evaluated by three items asking the value for the user, the value for the region, and the idea's novelty. To indicate the impact of the systematic feedback method, we asked about the effect on the team's creativity quantitatively and qualitatively. Also, an interview with a supporter of team B at W3 was conducted for further discussion.

As some of the participants arrived late or left early during the workshops and missed answering the survey, we used the answers of 40 participants in total (11 participants of W1, 15 participants of W2, and 14 participants of W3). Also, we excluded the answers to team variables by supporters (design practitioners giving advice to participants) at W2 since they did not belong to a particular team throughout the workshops.

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Table 1. Items of the survey

	Items	Mid-	Post-	
Team variables	Team Creativity	✓	✓	7 points scale
	Respondent's acceptance of team member's idea: Do you accept the idea that your team member generated?	✓	✓	5 points scale
	Team member's acceptance of respondent's idea: Do your team member accept the idea that you generated?	✓	✓	
	Acceptance of team's idea: Do your team members accept the idea that the team generated?	✓	✓	
Evaluation of ideas	Is the idea valuable for the user that the team specified?	-	✓	
	Is the idea valuable to implement for the region?	-	✓	
	Is the idea generated from a new perspective and new for you?	-	✓	
Feedback method	In the ideation mode, you gave feedback on each other's ideas. How much did it affect the team's creativity?	✓	✓	
	The reason you answered as above.	✓	✓	Free description

3 ANALYSIS RESULT

3.1 Relationship of acceptance, team creativity, and evaluation of ideas

Table 2 shows the result of the correlation analysis among the variables. We added up the average score of the three questions of Evaluation of Ideas in Table 1. Evaluation by others excludes and self-evaluation only includes the scores evaluating their own teams' ideas.

Through the analysis, we confirmed that although the items related to acceptance had significant correlations, only Acceptance of the team's idea and Team Creativity had a significant correlation. However, the evaluation of ideas did not have a strong relationship with other team variables. Evaluation by others and self-evaluation did not have significant correlations as well. This result affirms the hypothesis that encouraging acceptance of the team using the systematic feedback method will positively affect the team creativity, but deny that it will lead to higher evaluation of generated ideas.

Table 2. Correlation analysis result (N=37)

	2	3	4	5	6
1. Team Creativity	.236	.225	.457**	-.177	.222
2. Respondent's acceptance of team member's idea	-	.571**	.619**	.034	.162
3. Team member's acceptance of respondent's idea	-	-	.474**	-.136	.089
4. Acceptance of the team's idea	-	-	-	.019	.027.
5. Evaluation by others	-	-	-	-	.114
6. Self-evaluation	-	-	-	-	-

*p<.05, **p<.01

For further analysis, Figure 4 shows the result of team variables and the evaluation of the ideas of each team.

Regarding W1, team A's Acceptance, Team Creativity, and evaluation of ideas by both others and themselves were the lowest compared to the other two teams. Although the evaluation of the idea was the highest, team C's Acceptance and Team Creativity were lower than team B. Regarding W2, Acceptance, Team Creativity, and evaluation by others of team C were the highest compared to other teams. This result is convincing since team C keeps working with the team to implement the idea in the region after the kick-off workshop. Although the self-evaluation of team B was the highest, their

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Acceptance and Team Creativity were the lowest, and Team Creativity decreased from day 1 to 2. Regarding W3, team B's result was noteworthy. The Acceptance and Team Creativity, especially at the post-survey, and self-evaluation of the idea were extremely low compared with the other eight teams. Whereas, the Team Creativity of teams A and C gradually increased as the workshop proceeded. We can assume that something different was occurring to team B. The interview with the supporter (facilitator of the team having a specialty in design thinking) of team B was conducted and the result is described in this paper to further explore the result by qualitative approach.

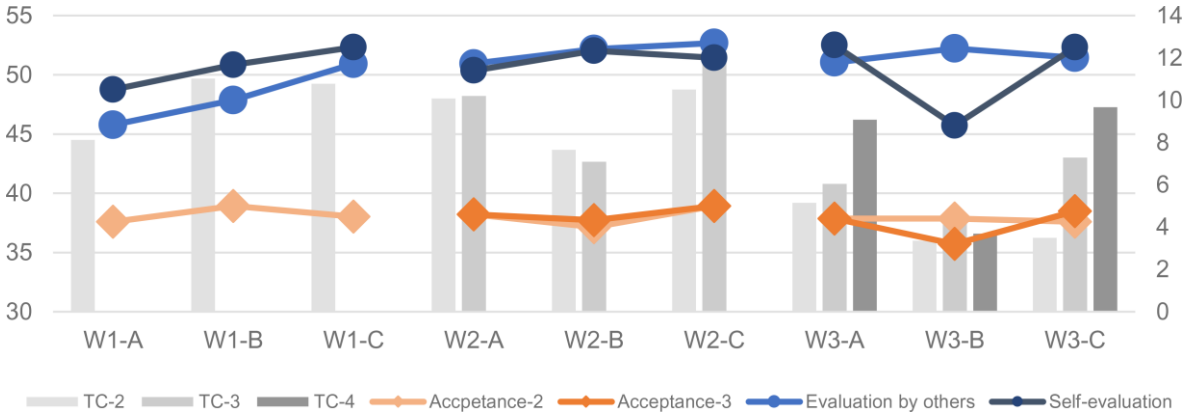

Figure 4. Team variables and evaluation of ideas of each team (N=37)

3.2 Effect of the systematic feedback method and valid functions

This section describes the analysis result of the effect of the systematic feedback method. We conducted both quantitative analysis and qualitative analyses.

3.2.1 Quantitative analysis

To quantitatively indicate the effect of the method on team creativity, we asked "At the ideation mode, we gave feedback to each other's ideas. How much did the feedback time affect the team's creativity?" and the participants answered with five points scale at the survey. Figure 5 shows the result of the answers to the survey after the day we held the ideation workshop; post-survey for W1, mid-survey after day 1 for W2, and mid-survey after day 2 for W3.

As the result, about 30% of the participants answered 5 that the feedback strongly affected the team's creativity at all the workshops. Regarding W1, all the participants answered 4 or 5 and recognised the effect. One participant in W2 answered fair (3) and others answered positively (4 or 5). However, for W3, there was one participant answered that the effect was not recognised at all (1) and two participants answered fair (3). Two of the participants who answered under 3 belonged to team B.

Therefore, we validated that the feedback method generally affected the team's creativity positively, but there were a few participants that could not recognise the positive effect.

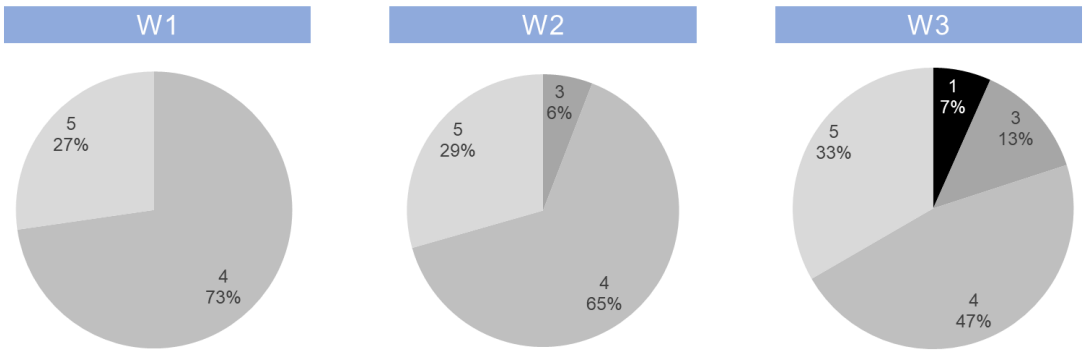

Figure 5. Effect of the feedback on team creativity (N=37)

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3.2.2 Analysis of free comments

We gathered 34 comments in total from the three workshops. To analyse the comments, first, we split them into positive ones to indicate the valid functions and negative ones to indicate improvements. Then, we classified the comments.

Table 3 shows the result of the classification of the comments and the number of comments. There were 28 positive comments and we classified them into four classifications, which are the valid functions of the method; perspectives, new ideas and creativity, communication, and psychological effects. 12 comments were about "perspectives". For example, "I received comments from different perspectives to my idea and it widen my mind" were classified as "different perspectives". Many participants realised that the team members had different perspectives from themselves and can generate new insights from them. Seven comments were classified as "new ideas and creativity". "A new idea came up to my mind by receiving feedback. Such idea was more connected and shared with team members than the previous idea I presented before receiving feedback" were classified as "leading to generate new ideas". Those comments indicated more clearly that feedback led to new creative ideas than the comments classified as "perspectives". We classified six comments as "communication". A participant answered that he/she understood the opinion of team members and felt that he/ she absorbed them. This classification does not mention the contents of the feedback but focuses on the aspect that it promotes understanding of each other and enhances supportive communication in the team. Finally, two comments were classified as "psychological effects". For example, "I became more confident of my creativity and ideas through feedback" were classified as "creative confidence". Another participant said that feedback motivated him/her to ideate. They indicated that feedback affected their psychological aspects of creativity. As well as diverging the perspectives and ideas, we validated that the method positively affects the communication inside the team leading to acceptance and individual creativity.

Table 3. Classification of free comments (positive)

Classification 1	Classification 2	No. of comments
Perspectives	Different perspectives	7
	A new perspective, insight	4
	Reframing individual thinking	1
New ideas and creativity	Leading to generate new ideas	4
	Adding new creativity	3
Communication	Understand each other	3
	Communication in the team	2
	Learning from other members	1
Psychological effects	Creative confidence	1
	Promote motivation to ideation	1
Others	Believing in feedback	1
TOTAL		28

Table 4 shows the classification of the negative comments. Six comments indicated negative points of the feedback method which indicate the areas for improvement. Two of the comments indicated that it was difficult to converge the idea into one as a team after the feedback. The comments do not deny the effect of the method itself but we should guide more accurately on how to connect to the next process. Also, two of the participants pointed out that it was difficult to feedback frankly what they felt since the relationship within the team was not open enough. A team-building process should be devised before the method to make it more effective. A participant seemed not satisfied with the quality of some comments, which we found difficult to control but could be partly supported by the method. Finally, a participant described that he/she wanted to receive feedbacks that reverse her/his confidence in the idea. However, the method does not intend to reverse confidence but to enhance it. We need to explain the purpose of the feedback to prevent misunderstandings.

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Table 4. Classification of free comments (negative)

Classification	No. of comments
Difficult to converge	2
Difficult to disclose oneself	2
Depends on the quality of the feedback	1
Couldn't reverse confidence	1
TOTAL	6

3.2.3 Interview result

Since we found out that team B in W3 had a low Acceptance, Team Creativity, and Self-evaluation of the idea, and two of the members were doubtful of the effect of the feedback., we held a semi-structured interview with the supporter of team B to clarify what was happening to the team. We asked the questions and received the answers below. Answers were summarized by the author.

1. How did the team condition change through the three-day workshop?

- The first day ended up with a friendly atmosphere. The mood declined on the second day. The problem was difficult to reframe, so I consciously promoted the members to speak up, but it was difficult to specify the idea to prototype as homework before day 3.
- On the third day, it turned out that no one created a prototype during the interval period. I felt responsible and reflected that my guide was not clear enough for them to take action. We tried to discuss what we could do as prototyping, but as the discussion proceeded it became clearer that the idea was not integrated. We selected an individual idea to jump on as a team but I found out that the members were not convinced of the idea we chose.

2. How was the feedback time delivered in team B?

- All of the presented ideas were very abstract. Although we have defined the problem, some ideas went off track. So, I tried to focus on an idea that seemed the easiest to prototype. However, when I think back, we couldn't converge ideas after the feedback time. Moreover, the problem definition was not explicit enough and didn't take shape as a "how might we" question.

3. Were the team members satisfied with the team's idea? Why?

- The final day closed without satisfaction with the team's idea. One of the reasons is that the team members living outside the city with the problem seemed difficult to empathize with the regional problems. Moreover, the relationship didn't get closer since they didn't try to step further into the problems.
- Each member didn't have an identity and didn't know the relationship they have with the idea.

Through the interview, we can indicate that the team needs to accept the team's idea by empathizing with the problem clearly defined in the earlier process to encourage team creativity. It becomes difficult to generate and converge an idea within the team without acceptance of the idea. Also, low satisfaction led to low self-evaluation of ideas. Since the team's mood is difficult to recognize by outsiders, especially in online settings, in which team discussions were held in break-out rooms, the evaluation of generated ideas by others might not have a direct relationship with team variables.

3.3 Characteristics of the teams

In order to indicate the characteristics of the teams that realise the effect of the method on team creativity, the correlation analysis was conducted between the team average of the items in Table 1, such as Team Creativity, acceptance, and evaluation of the idea, and the effect of the feedback method. Table 5 shows the correlation factors between the effect of the feedback method and other items.

The result indicated that when the teams have more members who accept the team member's idea and evaluate the team's idea higher tend to realise the effect of the feedback method on team creativity. It can be interpreted that the feedback method affects the individual's attitude to the idea of a team. On the other hand, it does not significantly affect the team creativity or acceptance of the team's idea, which are the variables that we aimed to encourage by the method directly. This result coincides with the negative comments in Table 4 described that the method lacks the function to lead to the next step, which converges the idea as a team.

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Table 5. Correlation factors between team average variables and the effect of the feedback method (N=9)

Items	Correlation factor
1. Team Creativity	.477
2. Respondent's acceptance of team member's idea	.677*
3. Team member's acceptance of respondent's idea	.173
4. Acceptance of the team's idea	.342
5. Evaluation by others	-.041
6. Self-evaluation	.856**

*p<.05, **p<.01

As the Respondent's acceptance of the team member's idea and Acceptance of the team's idea had a significant correlation as described in Table 2, we can assume that the direct effect of the feedback method on individual team member's acceptance would positively encourage the team's acceptance leading to team creativity.

4 CONCLUSIONS AND FUTURE RESEARCH

This study focused on promoting feedback within the team at the ideation mode of design thinking workshops. In particular, we designed the systematic feedback method and applied it to the three design thinking workshops dealing with regional challenges.

Through both quantitative and qualitative analyses, we answered the questions raised in the introduction of this paper. First, we indicated that acceptance of the team's idea, which was encouraged by the feedback, had a significant correlation with team creativity. However, the evaluation of the generated ideas and team variables did not have significant relationships. The result could be different depending on the evaluation items used to evaluate the idea. This is a future research topic to explore. Secondly, we confirmed that the method was effective to encourage team creativity for most of the participants. Valid functions were not only diverging minds and perspectives but encouraging communication and understanding of the team members and affecting their creativity. We identified the improvements that need to be approached in future research especially in the process before and after the feedback time. Finally, we indicated that the teams with more members who accept team members and highly evaluate their team's ideas tend to realise the effect of the feedback method. At this point, the method's effect is limited to individual team members' attitudes to their team's idea, instead of the team's behaviour. This is another future research theme to design the method to encourage the team directly. Future researches are necessary for further improvements, for example, the contents of the cards, different effect of the method among the team's characteristics, and clearer guides to improve the usability of the method.

REFERENCES

Akaki, M., Ioki, M., Mitomi, K., and Maeno, T. (2022), "Best Practices of Team-Building Activities in a Project-Based Learning Class 'Design Project' in a Japanese Graduate School", *17TH INTERNATIONAL DESIGN CONFERENCE*, 23-26 May 2022, Proceedings of the Design Society, pp. 2263 - 2272.

Akaki, M and Maeno, T (2022), " How Feedback and Conflict Affect Creative Behaviours in Teams with Acceptance of Ideas", *23rd CINet Conference*, Pisa, Italy, 11-13 September, Continuous Innovation Network.

Amabile, T. M., Conti, R., Coon, H., Lazenby, J., Herron, M. (1996) "Assessing the Work Environment for Creativity", *Academy of Management Journal*, Vol. 39, No. 5, pp.1154-1184. https://doi.org/10.5465/256995.

De Stobbeleir, K. E. M., Ashford, S. J., & Buyens, D., (2011), "Self-regulation of creativity at work: The role of feedback-seeking behavior in creative performance", *Academy of Management Journal*, 54, pp. 811-831. https://doi.org/10.5465/amj.2011.64870144

Doorley, S., Holcomb, S., Klebahn, P., Segovia, K., and Utley, J (2018), *Design Thinking Bootleg*. d.school, Hasso Plattner, Institute of Design at Stanford. Available at: (https://dschool.stanford.edu/resources/design-thinking-bootleg) (30 November 2022).

Gong, Z., Shan, C., Yu, H. (2019), "The relationship between the feedback environment and creativity: a self-motives perspective", *Psychology Research and Behavior Management*, 12, pp. 825-837. https://dx.doi.org/10.2147/PRBM.S221670

https://doi.org/10.1017/pds.2023.353 Published online by Cambridge University Press

Hoever, I., Zhou, J., Knippenberg, D. (2018), "Different Strokes for Different Teams: The Contingent Effects of Positive and Negative Feedback on the Creativity of Informationally Homogeneous and Diverse Teams", *Academy of Management Journal*, Vol. 61, No. 6, pp. 2159-2181. https://doi.org/10.5465/amj.2016.0642

Industry IoT Consortium®. (2022) "The Industrial Internet Reference Architecture", Version 1.10, An Industry IoT Consortium Foundational Document, 2022-11-07

Lee, J., Jung, Y., Yoon, S. (2019) "Fostering group creativity through design thinking projects", *Knowledge Management & E-Learning: An International Journal*, Vol. 11, No. 3, pp. 378-392. https://doi.org/10.34105/j.kmel.2019.11.020.

Mueller, J. S., Melwani, S., and Goncalo, J. A. (2012) "The Bias Against Creativity: Why People Desire but Reject Creative Ideas", *Psychological Science*, 23 (1), 13-17. http://dx.doi.org/10.1177/

Mumford, M. D., Gustafson, S.B. (1988), "Creativity Syndrome: Integration, Application, and Innovation", *Psychological Bulletin*, Vol.103, No.1, pp.27-43

Rank, J., Pace, V.L., Frese, M. (2004), "Three Avenues for Future Research on Creativity, Innovation, and Initiative", *Applied Psychology; An International Review*, 53 (4), pp. 518-528. https://doi.org/10.1111/j.1464-0597.2004.00185.x

Rauth, I., Köppen, E., Jobst, B., and Meinel, C. (2010) " Design Thinking: An Educational Model towards Creative Confidence", *First International Conference on Design Creativity*, ICDC 2010, Kobe, Japan, 29 November-1 December 2010, Springer, London, 2011 (DS 66-1).

Schuurman, D., Marez, L. D., and Ballon, P. (2016) " The Impact of Living Lab Methodology on Open Innovation Contributions and Outcomes", *Technology Innovation Management Review*, Vol. 6, No.1, pp. 7-16. https://dx.doi.org/10.22215/timreview/956

West, M. A. (2002a), "Sparkling fountains or stagnant ponds: An integrative model of creativity and innovation implementation in work groups", *Applied Psychology; An International Review*, 51(3), pp. 355-387. https://doi.org/10.1111/1464-0597.00951

Yoon, S.W., Song, J.H., Lim D.H., and Joo, B.K. (2010), "Structural determinants of team performance: the mutual influences of learning culture, creativity, and knowledge", *Human Resource Development International*, Vol. ad, No.3, July 2010, pp. 249-264. https://doi.org/10.1080/13678868.2010.483815

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

https://doi.org/10.1017/pds.2023.353 Published online by Cambridge University Press