
Feature Article

The Effects of Constructive Controversy on Motivation

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This study examined the effects of constructive controversy on motivation by investigating whether and how this can fulfill students' basic psychological needs of competence, relatedness, and autonomy. Constructive controversy is a type of cooperative learning that positively affects an individual's problem-solving and logical thinking skills. The participants were 32 first-year university students in Japan. Data were collected by tape-recording group conversations during engagement in two in-class constructive controversy activities. Analysis of data revealed the possibility that constructive controversy can affect students' motivation in a positive manner by fulfilling the three basic psychological needs. It was implied that teachers may want to actively use constructive controversy in university classrooms in order to increase students' global competencies.

本研究は基本的心理欲求(有能性、関係性、自律性)を満たす構造的討論(constructive controversy)の教室内での活動について調査した。構造的討論は問題解決力や論理的思考力を向上させる協同学習の一つである。参加者は日本の大学1年生32名で、データはテープレコーダーによって学生のグループ活動を録音する形で収集した。分析の結果、構造的討論は学生の動機づけに良い影響を及ぼす可能性が示された。本研究から、学生に国際的な技量を身につけさせるためにも、大学の授業において構造的討論を積極的に活用することが示唆された。

Constructive controversy is a type of cooperative learning which stimulates problem-solving and reasoning skills (Johnson & Johnson, 1979, 2001, 2009). Although this concept is not new, recent global crises have elucidated the importance of tackling issues cooperatively. More than ever, there is a need for individuals to be able to envision multiple perspectives. One way to develop such abilities is through engagement in constructive controversy. Controversy is

said to arouse curiosity, enable students to appreciate diverse perspectives, and promote self-esteem (Johnson, 2015).

Controversy has probably been the most studied in the field of social psychology (e.g., Brown & Pehron, 2019). It is a type of conflict that involves two parties who exchange ideas with one another and arises “when people’s views differ on matters considered important by all involved” (Jacobs, 2010, p. 291). According to Deutsch (1973), conflict arises when inharmonious activities occur. An inharmonious activity hinders or interferes with another activity, causing the latter to become less effective. However, by engaging with another party actively during controversy, different sides attempt to reach an agreement which often results in more mastery and further preservation of skills and material compared to concurrence-seeking, individualistic learning, or debate (Johnson, 2015). Johnson and Johnson (1979) built upon Deutsch’s (1973) theory in the educational context, proposing the concept of *constructive controversy*. Constructive controversy is a type of cooperative learning involving what Aristotle coined *deliberate discourse* to synthesize novel solutions (Johnson & Johnson, 2009). Deliberate discourse is “the discussion of the advantages and disadvantages of proposed actions” (Johnson & Johnson, 2009, pp. 38–39). In other words, what is valuable in constructive controversy is the process through which individuals share thoughts, not whether a position is right or wrong. Individuals need to learn how to take different perspectives, synthesize ideas, and come up with the best possible solution (Johnson & Johnson, 2001). In constructive controversy, more cognitive processing is induced as individuals discover a novel point of view (Johnson, 2015).

Constructive controversy has been applied to different age groups and has usually generated positive results (Snell et al., 2006). For example, Tichy et al. (2010) examined third-, fourth-, and fifth-graders’ academic achievement, moral development, ethical skills, and beliefs toward social interdependence by comparing constructive controversy to individualistic learning. Students in the experimental group worked on two constructive controversy activities, while students in the control group worked individually. Essay-type questions and questionnaires were used for assessment. Compared to the control group,

the authors found a rise in academic achievement, moral development, ethical skills, and beliefs toward social interdependence for students who engaged in constructive controversy. Another study involved undergraduate and graduate students enrolled in a course on engineering grand challenges where collaborative problem-solving was conducted (Smith et al., 2015). Student groups were found to approach constructive controversy in different styles, such as “consensus and combination”, “forcing and following”, and “confrontation and synthesis” (p. 123). It was also discovered that students who used a confrontation and synthesis style came up with the best-synthesized solution and had the highest self-reported gains in most learning outcomes. Consensus and combination produced harmonious relationships and the highest self-perceived learning outcomes in problem solving. Yet another study involving constructive controversy is one by Wang et al. (2010) in which business customer service personnel’s self-reported measure of team constructive controversy and team cooperative goals were analyzed using results from a questionnaire. Findings indicated that developing team cooperative goals predicted constructive controversy. It was also suggested that in order to foster constructive controversy, heterogeneity of agreeableness of individuals should be considered. In other words, individuals with agreeable personalities should be teamed up with individuals who are less so. Although participants of the current study are university students, the fact that constructive controversy has been applied in various contexts suggests its potential to be adapted to different settings.

Johnson and Johnson (2009) laid out educational conditions and procedures for constructive controversy to be managed effectively in classrooms. First, they suggested that teachers organize students into two pairs. One pair is assigned the “pro” position of a topic, and the other the “con” position. Next, students are encouraged to go through the five-step procedure listed below (Johnson & Johnson, 2009).

1. Investigate and prepare a good argument for the given position. Pairs can share their ideas with other pairs in the class who are defending the same position.
2. Give a presentation to the opposing pair in the group of four working

together, while advocating their assigned position (pro or con). Both members of each pair should participate. While listening, students take notes and ask questions if anything is unclear.

3. Openly discuss the topic, arguing only why the assigned position should be supported. Students should remember that most topics are complex and that it is necessary to understand both sides of the argument.
4. Change perspectives and argue from the opposite point of view. Students can add new information that they have found or considered.
5. All four students drop their positions and integrate their findings into a joint position that everyone can agree on. This can be in the form of the following, although not limited to these: a paper, a presentation, or a test. Students can reflect on and process the degree to which they worked well with one another.

The instructor's role in constructive controversy is said to involve five factors. First, instructors introduce lesson objectives. Second, they make pre-instructional decisions such as the topic of discussion, and how to put students into groups. Third, instructors explain the task, the interdependence students have towards each other, and the procedure for constructive controversy. Fourth, they monitor the groups and provide assistance to help complete the task, follow constructive controversy procedures, and use interpersonal skills. Lastly, instructors evaluate how well students did and help them process how effectively they functioned as a group (Johnson, 2015).

Constructive controversy is said to produce favorable outcomes. These include greater retention and understanding of learned material, higher levels of self-esteem, increased levels of achievement, continued motivation to learn a subject even after course completion, and increased energy to study (Jacobs, 2010; Johnson, 2015). Additionally, it is believed that decisions and solutions of higher quality are produced (Hoffman et al., 1962). Despite these optimistic results, it appears that constructive controversy has not been employed enough in classrooms in Japan. This may be due to the value placed on maintaining the Japanese concept *wa*, "the creation and maintenance of peaceful unity and conformity within a social group, with a commitment

to cohesive community taking precedence over personal interests” (Hirata & Warschauer, 2014, p. 7). *Wa* can cause those within a group to try to avoid conflict. For example, one student in the present study mentioned that there were times during group work when she did not agree with other people’s views. However, she did not argue or express her opinion due to worrying that people may dislike her. This student appeared to intentionally avoid the disruption of *wa* in her group for fear of being ostracized by her peers. Although this sentiment is understandable especially during adolescence when individuals tend to emphasize social acceptance (American Psychological Association, n.d.), such thoughts could become an encumbrance in a multi-cultural society. As the world becomes more globalized and individuals from various backgrounds and cultures collaborate with each other to address common issues, it is important for students to acquire the skills necessary to constructively discuss with others in a common language. If teachers can motivate university students to do so in the classroom, they may not shy away from such opportunities after graduation. Thus, it is important for teachers to motivate students to engage in productive and meaningful conversations.

A prominent theory within the field of psychology on motivation is self-determination theory (SDT) proposed by Ryan and Deci (2017). SDT is an approach to explain motivation based on the extent to which it is internally regulated within an individual (Deci & Ryan, 2012). SDT categorizes motivation into intrinsic motivation, extrinsic motivation, and amotivation. Intrinsic motivation is when an individual does something out of pure enjoyment. Extrinsic motivation is when an action is conducted due to external pressure, although the degree of this force may differ. Amotivation is the absence of motivation (Deci & Ryan, 2012). SDT is composed of six mini-theories, one of which is basic psychological needs theory (BPNT). According to BPNT, humans have three basic psychological needs (BPNs) regardless of different attributes such as race, gender, or age. These needs are autonomy, competence, and relatedness (Ryan & Deci, 2017). Autonomy concerns the feeling that one is choosing one’s own actions. Competence involves the emotion that one is effective in performing a task. Relatedness is the sense of connection one feels

with others (Vansteenkiste et al., 2020). It is believed that extrinsic motivation lies on a continuum and internalizes as one's behavior becomes self-determined (Niemic & Ryan, 2009). Studies suggest that the satisfaction of BPNs is positively related to intrinsic motivation (Ryan & Deci, 2017; Walker et al., 2020; Vansteenkiste et al., 2020).

There have been many studies concerning BPNs applied in the Japanese English as a foreign language (EFL) setting. For example, Hiromori and Tanaka (2006) investigated the possibility of motivating English language learners in Japan by conducting a group presentation activity with 113 university students. A questionnaire that measured students' intrinsic motivation towards English language learning and their basic psychological needs was administered pre and post intervention. The difference in scores between the two data-gathering points was used to indicate the development of students' intrinsic motivation. Students felt that the need for competence and autonomy impacted their motivational development, as indicated by a growth curve model created to investigate the effects that BPNs had on the increase of intrinsic motivation.

Furthermore, the results revealed that the need for relatedness had a limited effect on increasing intrinsic motivation (Hiromori & Tanaka, 2006). However, Deci and Ryan (2000) point out that the need for relatedness supports the other two BPNs. For example, if a certain individual's friend is good at English or thinks English is important, the realization of this may positively affect the individual's actions in the future. Thus, Hiromori and Tanaka (2006) encourage teachers to increase students' perceived BPNs and intrinsic motivation in English language learning by conducting activities such as group work. Another study conducted in Japan regarding BPNs is Agawa and Takeuchi's (2016). They studied 317 Japanese students' BPNs fulfillment and second language (L2) motivation. Students from three academically different universities and a variety of majors ranging from engineering, Japanese, sociology, and law, answered a questionnaire that tested their BPNs and L2 motivation. Analysis of the data suggested that fulfilling the need for competence has the most favorable impact on English language learners' motivation as does relatedness needs albeit to a weaker degree. However, autonomy need satisfaction had a negative effect

on intrinsic and extrinsic motivation. In yet another study, Hashimoto (2022) examined the effects that engaging in two types of cooperative learning activities in a different order had on students' perceived BPNs. Informal cooperative learning, which lasts for a maximum of one lesson, and formal cooperative learning, which continues for several lessons, were investigated. Results suggested that students' perceived BPNs and L2 motivation are affected by the type of cooperative learning activity they engage in as well as the sequence in which these are conducted.

Although these studies as well as others examine Japanese university students' BPNs, they do not measure BPNs for constructive controversy. However, as noted earlier, investigating university students' motivation in the context of constructive controversy is highly meaningful, as there is a potential this will contribute to raising global citizens who are better aware. In an age where digital technology has allowed people to easily connect, the need for people to hone their communication skills to interact with individuals from diverse backgrounds has increased. For students to successfully navigate the current global society, they require skills to face and effectively come up with solutions in a collaborative manner. Constructive controversy should strengthen their abilities to do so. Moreover, it is better if students are intrinsically motivated to engage in constructive controversy, since there is a greater chance they would willingly continue to engage in this beyond university. Hence, the current study explored constructive controversy in relation to BPNs. The research questions were as follows: Can constructive controversy satisfy Japanese university students' BPNs in an EFL classroom setting? If so, how?

Methods

Participants

The participants were 32 first-year university students in two compulsory English classes at a private university in Japan. Students had 90-minute lessons once a week for 15 weeks. Their reading and writing skills in English were CEFR B1-B2 level (Council of Europe, 2020) as estimated by the instructor through written assignments that they handed in during lessons. Their listening and

speaking abilities were A2-B1 level (Council of Europe, 2020) as also assessed by the instructor. An intermediate-level textbook which covered the four skills in English (reading, writing, speaking, and listening) was employed for the course.

Procedure

The study was conducted during the second semester of the 2022 academic year in classes where the researcher was the instructor. Mask-wearing was required by all students and faculty during the course due to the continued threat of COVID-19. Heterogeneous groups were created by the instructor according to various characteristics such as estimated CEFR level of the students, their hometowns, and the high school where they graduated.

A total of two constructive controversy activities were conducted, each lasting for one lesson. However, as time was needed to take attendance and make announcements at the beginning and end of each class, student engagement in constructive controversy was roughly 60 minutes per class. Students stayed in the same group for both activities. For the first topic (Topic 1), students were asked to discuss whether credit cards were better than cash. For the second topic (Topic 2), students shared if they thought school uniforms were good or bad. Students were provided with English reading material for both the pro and con positions because of the relatively short time frame of the activity but were allowed to look up additional information during the lesson using their computers and smartphones. Both activities were conducted following the five steps of constructive controversy suggested by Johnson and Johnson (2009) as described earlier.

Data were gathered while students participated in constructive controversy by tape-recording conversations. One tape recorder was placed in the middle of each group of four after step 1 in the constructive controversy procedure. It was verbally explained to students in Japanese that conversations were recorded for research purposes only and that participation was voluntary. Overall, four tape recorders were placed in groups that agreed to take part in the study. The recordings were transcribed and checked by a Japanese-English bilingual to ensure reliability. The study was conducted in an English language class,

so students were asked to speak in English during the activities. Recordings were transcribed verbatim, which included any Japanese expressions they may have used despite instructions to the contrary. The Japanese expressions were translated into English by the researcher as indicated by brackets ([]) following the Japanese. Transcribed conversations were read, reread, and analyzed using BPNT (Ryan & Deci, 2017) as a theoretical framework. The transcripts were coded in the following way. Topic 1 = T1, K1 = Class 1, Group 1 = G1, Student 1 = S1, and so on. This was followed by a colon (:), and then the following were used to identify BPNs in each topic, C1= first occurrence of competence fulfillment, R1 = first occurrence of relatedness fulfillment, and A1= first occurrence of autonomy fulfillment. For example, if the transcript belonged to Group 1 in Class 1, was spoken by the first student on the registrar list in the group (in alphabetical order of last name), and was the first case of competence fulfillment that was seen while this group was talking about Topic 1, the sentence would be labeled T1-K1-G1-S1: C1.

Results

An average of 56 minutes and 31 seconds were tape-recorded per group for each lesson. Group conversations were analyzed to investigate how constructive controversy satisfies students' perceived BPNs. Occurrences of the fulfillment of each BPN were calculated, which revealed 128 cases for competence, 42 cases for relatedness, and 30 cases for autonomy. Table 1 depicts the number of times fulfillment was seen in student conversations of the needs for competence, relatedness, and autonomy for Classes 1 and 2 for each topic, and Table 2 breaks this down according to group.

Results seem to indicate that in all groups, the fulfillment of competence, relatedness, and autonomy was seen in student conversations. The number of occurrences of each BPN fulfillment either stayed the same or increased from Topics 1 to 2. Furthermore, out of the three BPNs, the fulfillment of the need for competence appears to have had the greatest number of occurrences followed by relatedness, then autonomy.

Table 1

Number of Occurrences of BPN Fulfillment for Classes 1 and 2

	Topic 1		Topic 2	
Class 1	Competence	24	Competence	32
	Relatedness	7	Relatedness	13
	Autonomy	5	Autonomy	9
Class 2	Competence	35	Competence	37
	Relatedness	8	Relatedness	14
	Autonomy	6	Autonomy	10

Discussion

Going back to the research question, this was whether and how constructive controversy can satisfy Japanese university students' BPNs in formal English as a foreign language (EFL) classroom settings. Results suggested that constructive controversy does appear to have the potential of satisfying students' BPNs. What follows are some examples that were observed of how each BPN appears to have been fulfilled.

Competence

An occurrence of competence which was seen in student comments is as follows.

So...*nante iunndarou?* [I wonder how you say it?] Umm...yes, yes, yes.
Nandakke na-. [I forgot what it is.] Uniforms affordable because parents don't have to buy every year. So, umm...so I think it is very...umm...
"Okane wo tsukau" te nante ieba iindarou...[I wonder how you say, "you have to spend money."] (T2-K1-G2-S1: C4)

Spend. (T2- K1-G2-S2: C4)

...*Shuppi* [Spend money]. (T2- K1-G2-S1: C4)

Spend money. (T2- K1-G2-S3: C4)

Spend money? Oh, Okay...But not a lot of money. (T2- K1-G2-S1: C4)

Ahh... (T2- K1-G2-S4: C4)

Table 2

Number of Occurrences of BPN Fulfillment for Classes 1 and 2 Per Group

Topic 1				Topic 2			
Class 1	Group 1	Competence	6	Class 2	Group 1	Competence	9
		Relatedness	2			Relatedness	4
		Autonomy	1			Autonomy	3
	Group 2	Competence	7		Group 2	Competence	8
		Relatedness	2			Relatedness	3
		Autonomy	2			Autonomy	2
	Group 3	Competence	6		Group 3	Competence	7
		Relatedness	2			Relatedness	2
		Autonomy	1			Autonomy	2
	Group 4	Competence	5		Group 4	Competence	8
		Relatedness	1			Relatedness	4
		Autonomy	1			Autonomy	2
Class 2	Group 1	Competence	9	Class 2	Group 1	Competence	10
		Relatedness	2			Relatedness	4
		Autonomy	2			Autonomy	4
	Group 2	Competence	11		Group 2	Competence	10
		Relatedness	3			Relatedness	4
		Autonomy	2			Autonomy	3
	Group 3	Competence	8		Group 3	Competence	8
		Relatedness	2			Relatedness	2
		Autonomy	1			Autonomy	2
	Group 4	Competence	7		Group 4	Competence	9
		Relatedness	1			Relatedness	4
		Autonomy	1			Autonomy	1

Here, S1 is assisted by S2 and S3 to come up with the terminology he would like to use. S2 and S3 appear to have helped S1 in his zone of proximal development, the level of where he is currently at, and where he can be, through collaboration with more capable peers (Vygotsky, 1978). His knowledge is scaffolded by S2 and S3, seemingly fulfilling S1's need for competence. Scaffolding is a process "that enables a child or novice to solve a task or achieve a goal that would be beyond his unassisted efforts" (Wood et al., 1976, p. 90). At the same time, S2 and S3 effectively contributed to the group by demonstrating their knowledge. They may have recognized their competence in relation to some of their classmates who were less capable in English.

The level of English speaking for students who participated in the study was not as good as their written English, so they often seem to have struggled for words during constructive controversy. This may explain why there were many cases of scaffolding recorded amongst groups. However, students did not willingly assist one another from the beginning. Here is an excerpt of the same group above toward the beginning of their first constructive controversy activity.

Umm...Okay, should I go first?... Okay, I'll go first. I think cash is better than credit cards because credit cards...umm...*Tsukuruno taihen* [Difficult to make]...*Nante ieba* [How can I say this] *Etto...*[umm]...*A!* [I've got it! Difficult?...Difficult to...*mm-*[Umm]. (T1-K1-G2-S3: C0)¹

In this instance, S3 spoke as if he were giving a monologue with no assistance from his group members. His need for competence was not met, or may even have deteriorated. Speaking in front of unfamiliar peers could have possibly made him feel uneasy. Moreover, face masks may have added to his anxiety because this covered half of his classmates' faces. Wearing masks create a physical impediment to communicate in an effective manner at the minimal (Marler & Ditton, 2020). However, group members appear to have eventually helped one another. This may have been because students' need for relatedness was fulfilled as they became closer. According to Ryan and Deci (2017), once one's relatedness needs are satisfied, the act of helping others truly becomes volitional. It is possible that this occurred in the situation just mentioned.

Relatedness

An example of a dialogue that portrays fulfillment of the need for relatedness is below.

A lot of schools have only boy or girl uniform. Only two... (T2-K2-G3-S1: R2)

Only two. Yes. (T2-K2-G3-S2: R2)

I think it is old-fashioned. It is...umm...so, for example, I have one friend. He is...*Nante ieba iinndarou* [How should I say this]...He is a boy. But his mind is not a boy. (T2-K2-G3-S1: R2)

Uhh...yeah. (T2-K2-G3-S3: R2)

But he is a boy so he should wearing a boy's uniform. (T2-K2-G3-S1: R2)

Un. [Yes.] But he or she wants to wear a girl's uniform? (T2-K2-G3-S4: R2)

Ahh...yes, yes. (T2-K2-G3-S1: R2)

In this dialogue, S1 talked about a sensitive issue regarding her friend. Had she not felt comfortable with her peers, she may not have shared this information. Furthermore, S4 checked her understanding by rephrasing the situation. It is possible that S4 showed respect and care for S1, signifying that a sense of mutual relatedness had been established within the group. Therefore, a connection and a sense of belonging, both of which denote the fulfillment of relatedness (Ryan & Deci, 2020), appear to have been present. According to Johnson (2015), group sessions should be pleasant, enjoyable, and lively. This suggests that the need for relatedness should be satisfied, which could have been the case in this example.

Autonomy

The third BPN which appears to have been satisfied through constructive controversy is autonomy. Autonomy is said to be thwarted when one feels that they are being externally controlled (Mynard & Shelton-Strong, 2022). It seems that students initially did not enjoy their autonomy and rather felt restrained due to this because they were assigned a position. This can be seen in the next example.

So...we think credit cards are better? (T1-K2-G4-S1: A0)¹

I think so. (T1-K2-G4-S3: A0)

Umm...but I don't think credit cards are better...(T1-K2-G4-S1: A0)

S3 seems to have felt inhibited in his given position. He may not have recognized that within his assigned stance, he was free to construct his argument. Later in the group work, however, it is implied that he realized this as seen in the next dialogue.

We can choose what we want to say? (T1-K2-G4-S1:A1)

Yeah. We can choose why we think cash is better...right? (T1-K2-G4-S2:A1)

That's right. (T1-K2-G4-S3:A1)

Oh, okay. Good. (T1-K2-G4-S1:A1)

S1 appears to have wanted his group members' confirmation that he has the autonomy of being able to choose the argument. This may explain why he seems happy when S2 and S3 affirm that this is so.

Moreover, constructive controversy by nature allows students to choose the level of English they wish to present in, so students' need for autonomy is likely to be satisfied. Below is an example of a student who noticed this.

My English is...bad. (T2-K2-G3-S3: A1)

Me too...but we can choose. (T2-K2-G3-S4: A1)

Choose? (T2-K2-G3-S3: A1)

Yes. We can choose English. (T2-K2-G3-S1: A1)

Oh. Yes! Good. (T2-K2-G3-S3: A1)

Ryan and Deci (2017) propose that when relatedness and competence needs are fulfilled, autonomy is likely to be enhanced. As these two BPNs appear to have been satisfied in both classes that took part in the study, this could have also assisted in fulfilling students' needs for autonomy.

Although students' BPNs seem to have been satisfied through constructive controversy, it appears that there was a difference in the degree of fulfillment of each BPN according to the subject matter students were asked to talk about. A reason why instances of the satisfaction of BPNs in Groups 1 through 4 for Classes 1 and 2 were lower for Topic 1 than for Topic 2 could be due to the nature of the first theme. Topic 1 asked students to discuss their thoughts about credit cards versus cash. Some students mentioned that they did not own a credit card,

nor did they use cash often. When I asked these students what form of payment they used, they replied that they paid using a QR code or prepaid transportation card. Although Johnson and Johnson (2009) point out that any topic can be a subject of constructive controversy, it may be somewhat difficult to feel a strong emotion for a theme one is not familiar with.

On the contrary, Topic 2 concerned school uniforms. In an online survey conducted on 1,099 high school students in Japan, only 18.1% of females and 17.6% of males answered that they did not have a winter school uniform (Kanko Gakusei Fuku Kabushikigaisha, 2021). This indicates the likelihood that most students had the experience of wearing school uniforms prior to entering university, which suggests many were probably familiar with the topic. This could have contributed to the increased occurrences of the satisfaction of BPNs seen in the results. Therefore, it appears that constructive controversy can fulfill students' BPNs of competence, relatedness, and autonomy, although the level of fulfillment may differ according to the topic of discussion.

Constructive controversy is known to bring many benefits to students' learning yet is not utilized enough in Japanese classrooms. An explanation for this could be because of the *wa* culture in Japan. Although the culture of *wa* can be beneficial to maintain peace within a small community, it can also be a hindrance in the global, complex society in which we live today. It may be necessary to break free of *wa* at times and engage in meaningful controversies through conversations in order to consider multiple aspects and reach the optimal solution on issues as a group. If teachers can motivate students to willingly engage in constructive controversy, they may be better equipped with the necessary skills to succeed in a global society.

Limitations

Although this study shed light on a much-needed area of inquiry, it has four limitations worth mentioning. First, it may have been better if more time were allocated for each constructive controversy activity. This would have allowed students to build better supporting arguments which could have increased their perceived competence. Second, it is possible that asking about students' past

experiences of constructive controversy may have allowed for a more in-depth analysis. This information could have affected students' attitudes toward the activities, which would have impacted the fulfillment of their BPNs. Third, the possibility that BPNs increased because constructive controversy was conducted twice instead of once, cannot be denied. A study conducted after engagement in one constructive controversy activity may also be worthwhile. Lastly, constructive controversy conducted before or after other types of cooperative learning such as informal or formal as seen in Hashimoto's study (2022), may have yielded different results. These points may be worth incorporating in future studies.

Conclusion

This study investigated the effects of constructive controversy on motivation by researching whether and how this could fulfill students' basic psychological needs of competence, relatedness, and autonomy. Results suggested that first-year university students' BPNs can be satisfied by conducting well-planned constructive controversy in lessons although the level of this may be affected by the topic of discussion. It is implied that university teachers actively use constructive controversy in their classrooms to enable students to appreciate various perspectives and tackle issues cooperatively on a global scale.

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Notes

¹ The "0" indicates the lack of BPN fulfillment.

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