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Abstract: The purpose of this study was to examine how team process factors relate to students' self-efficacy, attitude, and learning satisfaction in flipped learning. Since lone-wolf students tend to have little patience for the group work process and exhibit a lack of organizational commitment, this study also explores how students' preferences for collaborative work or individual work affect their self-efficacy, attitude, and learning satisfaction in a flipped classroom. The participants were thirty-four undergraduate students enrolled in a consumer behavior course offered by a school of business at a university in Seoul, South Korea. Data were collected through surveys that measured team process, lone-wolf tendencies, self-efficacy, and attitude during the course. The results show the factor of team trust had a significant negative correlation with the lone-wolf measure but a positive correlation with responsibility, communication, cognitive and social competency, and self-efficacy. Moreover, communication and responsibility were positive predictors of self-efficacy and attitude. These results imply the usefulness of identifying critical variables of individual difference, such as lone-wolf tendencies, that could lead to both dysfunctional team process and low outcomes. Based on the results, this study provides implications for structuring and managing team projects in a higher education setting.

Keywords: collaboration; lone wolf; learning preference; team learning; flipped learning

1. Introduction

Educators are confronted by the need to explore instructional strategies that effectively engage students in the classroom in order to enhance their understanding as well as foster their learning processes. Several studies have shown a growing interest in utilizing flipped learning as an innovative teaching method in higher education [1,2]. Flipped learning reverses traditional methods by providing students with lectures and learning materials outside the classroom and engaging them in activities and practice inside the classroom [3]. It is designed to create more meaningful learning experiences by encouraging students to take responsibility for their learning and to allow them to be more active through studentcentered activities during class time. In particular, this instructional approach meets the recent need in business and marketing education to foster quality face-to-face activities and teamwork. For instance, EQUIS, one of the foremost comprehensive institutional accreditation systems for business and management schools, has emphasized critical managerial skills such as teamwork and interpersonal skills as important assessment criteria for high-quality business education [4].

Team learning is commonly utilized in flipped classrooms. Recent research has revealed that flipped classrooms help students acquire skills in areas that are essential to 21st century workplaces, such as collaboration, responsibility, and communication skills [5,6]. Based on these positive findings, it is necessary to examine how individual-level factors



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Copyright: © 2022 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https:// creativecommons.org/licenses/by/ 4.0/). affect the process of group work and learning outcomes. For example, students may lack satisfaction in their team learning experiences due to dysfunction and interpersonal conflicts, such as free-riding or social loafing [7,8]. These may affect team performance, team stability, the dynamics of the group, and group structure [9,10]. Furthermore, individual student characteristics, such as preferences regarding team learning, may influence group work. A review of the literature on team learning highlights the need for a more cultured understanding of the relationship between students' characteristics and the social context in which they learn (e.g., teamwork climate, process) [11–13].

Among the relevant variables, researchers have identified the "lone wolf," a student whose preference is to work alone, as a critical factor in team learning [14,15]. Barr et al. [14] reported that the individual-level factor of the lone wolf, characterized as an individual who tends not to trust others to perform the work and who prefers to work alone, has a negative impact on team performance. Several researchers have also suggested that the lone-wolf tendency may impede team interaction and functioning [16,17], and the results of this team learning experience may negatively affect students' perceived learning outcomes. Although these variables may impact team dynamics as well as learning outcomes, there is a lack of research on them. As such, it is critical to understand how the teamwork process and students' work preferences, specifically, their tendency to work as collaborators or lone wolves, are related to one another and how these factors impact learning outcomes. Examining these points will provide implications for how to organize and support team learning that fosters successful experiences in higher education settings.

To this end, this study examines how team process factors are related to students' perceived learning outcomes such as self-efficacy, attitude, and learning satisfaction in flipped learning. Since lone wolves tend to have little patience for the group work process and exhibit a lack of organizational commitment, this study also aims to explore how students' preferences for collaborative work or individual work affect their self-efficacy, attitude, and learning satisfaction in a flipped classroom. This study focuses on the following research questions:

- 1. How are team process factors related to students' self-efficacy, attitude, and learning satisfaction in a flipped learning classroom?
- 2. Do individual students' work preferences (collaborative vs. lone-wolf tendencies) affect their self-efficacy and learning satisfaction in a flipped learning classroom?

2. Theoretical Background

2.1. Team Learning in Flipped Classrooms

A number of studies have found that flipped classrooms have a positive impact on student outcomes compared with traditional classrooms [18–21]. In flipped learning classrooms, students are engaged in meaningful activities by reflecting, solving problems, discussing individual opinions and ideas, applying their knowledge, and providing feedback on their learning processes during team learning. Many researchers have identified that in-class activities facilitate positive student learning outcomes including self-efficacy, attitudes, and learning satisfaction.

Self-efficacy refers to individuals' belief in their capacity to perform actions necessary to produce specific task outcomes [22]. Self-efficacy consists of their assessment of their own ability, or confidence, to complete a task. As such, it is often positively associated with motivation to learn and academic performance [23]. Thai and colleagues [24] found that students in a flipped learning setting demonstrated significantly higher self-efficacy changes compared with students in online learning. In Chang et al.'s [25] study, the authors developed a self-regulated approach to facilitate students' interactions with peers and teachers during flipped learning and found that this improved students' self-efficacy and learning outcomes. Nevertheless, higher self-efficacy may not always lead to higher academic performance. Purzer [26] found supportive discourse was significantly related to self-efficacy but not related to student achievement scores in a team learning context. Flipped learning is designed with the assumption that students are more satisfied with their learning when they are able to actively participate in class activities. Research suggests that students typically find flipped classroom approaches appealing [27] and that students in higher education are more satisfied with their learning and demonstrate better academic results with this approach than with traditional lectures [11,28]. To better understand flipped learning experiences from the students' point of view, one needs to examine how team members participate in team projects, communicate with other members, establish team cohesion, and establish a sense of community [29].

2.2. Team Process Factors

Additional factors concerning how individual learners participate in team processes may have an impact on outcomes of teamwork [30,31]. An effective team process can improve team performance despite potential conflicts between diverse members [32]. Various factors may be in effect in flipped classrooms where students are expected to actively participate and contribute knowledge in the group process. This study focuses on team trust, responsibility, communication, and cognitive and social competency as key factors shaping how students effectively participate in a team process.

2.2.1. Team Trust

An attitude of trust in others and respecting different perspectives is an important factor shaping the team process. Trust in a teamwork setting can be defined as a member's expression of confidence that they will not be harmed, exploited, or put at risk by the actions of the other members [33,34]. A trusting relationship can be built on the willingness to accept vulnerability and expectation based on previous mutual interactions that others will reciprocate trustworthily [35]. A number of studies suggest that trust affects team process and performance by shaping how team members communicate, collaborate, compromise, and share knowledge [36–39]. Team members tend to trust one another more if they are familiar with each other [40]. Alternatively, trust can be developed through productive team interactions, such as knowledge sharing and collaboration [36].

2.2.2. Responsibility

As much as trusting other members is important, taking responsibility for assigned tasks also affects team process. Being a responsible individual is one of the fundamental conditions for cooperative learning [41–44]. Students can be responsible for completing their own work as well as facilitating other members' work, and those who have a stronger sense of individual accountability are likely to take on more responsibility in a cooperative learning context [45]. Teams that share responsibilities are more likely to contribute substantially to team performance outcomes than teams whose responsibilities are owned by a single member (i.e., leader) [46]. Similarly, students who feel responsible for their own learning are likely to have favorable learning experiences and outcomes [47].

2.2.3. Communication

The ability to communicate complicated and sensitive issues effectively can lead to positive team experiences. Specifically, in flipped learning classrooms, communication can enable positive learning experiences such as identifying, experiencing, and evaluating diverse perspectives of other peers during learning processes [19,48]. In a study with engineering students engaged in team-based learning, Purzer [26] found that support-oriented discourse was moderately related to students' academic self-efficacy, whereas challenge-oriented or learning-oriented discourse did not result in significant correlations with self-efficacy. Communication also influences team performance, in conjunction with other team process factors, such as familiarity, trust, and cohesion [14,40]. Considering the timing of teamwork, more frequent and effective communication is necessary for better performance in the early stages of the team process [49].

2.2.4. Cognitive and Social Competency

Effective processes in which a team engages during learning can be viewed as instances of collaborative problem solving. According to Hesse et al. [50], successful collaborative problem solving requires competencies in both cognitive and social domains as participants demonstrate coordinated efforts through processes of problem identification, problem representation, planning, executing, and monitoring. Researchers have tried to better understand how individuals with different perceptions about their cognitive abilities perform in a team and suspect that their social experience in a team might impact team performance and their perceptions of the experience [30,51]. Sonnentag and Volmer [52] found that individual expertise positively predicted members' contribution to team communication processes and that self-efficacy was negatively related to team meeting contribution. More recently, Chen et al. [53] reported that, for high-performing learners, motivational and behavioral factors were related to both social and cognitive domains, but for low performing learners, only the social domain was related, supporting the nuanced role of learners' cognitive and social competencies during teamwork that was previously suspected.

2.3. Lone-Wolf Tendencies

Despite the popular use of team learning in flipped classrooms, some people prefer to work alone, while others would rather benefit from working together. However, not everyone who prefers working solo is a bad collaborator [14]. In the literature on teamwork, lone-wolf tendencies have been identified as an individual-level factor that shapes team processes [14,16]. Lone wolves are defined as individuals who tend to prefer working alone when making decisions and setting goals, as they lack trust in or patience for others. Hansen [54] identified students preferring individual work as one of the major problems faced during projects that require teamwork (lone-wolf effect). However, lone wolves must be viewed as being different from social loafers or free riders. Lone wolves usually trust other members to perform a task that the team has to complete and are more responsible in completing the task [14]. They are also autonomous [16], suggesting that teams with more lone wolves would still perform as well as others despite their not enjoying the experience [17].

Prior studies have found conflicting results on the effect of lone-wolf tendencies on student team performance. Barr et al. [14] found that lone wolves, identified by both peer assessment and self-assessment, have a small negative impact on team performance. However, Shankar and Seow [17] found that lone-wolf tendencies tend to be negatively associated with perceived team project experience and skill improvement, but not with actual team performance. These conflicting results suggest that factors other than team members' lone-wolf tendencies may be influencing student team performance. In this study, we investigate how individual factors that influence team process alongside lone-wolf tendencies contribute to the overall team learning experience in a flipped learning environment.

3. Method

3.1. Participants

The participants in this study included 34 third-year undergraduate students (56% male and 44% female) who were enrolled in Consumer Behavior in the spring semester at a university in Seoul, South Korea. Thirty-five students initially signed the informed consent form, but one student dropped the course, so their data was excluded. Thirty-two students were majoring in business, one in social welfare, and one in urban society.

3.2. Context of Learning

This study took place in a 16-week undergraduate course offered by the School of Business. The aim of this course was to facilitate understanding of the foundation of theory in consumer behavior as well as to equip students with the ability to critically identify and evaluate problems observed in real life and adopt a theory to solve them. The class met 3 h every week. The course was designed with flipped learning that incorporated case-based learning and collaborative group work. Each week before class, students were required to watch online lectures created by the instructor that delivered the week's learning topics. In class, students analyzed a case study and discussed effective solutions by applying the concepts and knowledge they had learned from the online videos (Figure 1).



Figure 1. Context of learning and data collection procedure.

Students were randomly assigned to eight groups of 4–5 members. They engaged in six cases with their group (Weeks 3–8). After the midterm exam, they were randomly reassigned to new groups and worked on five additional cases. A total of eleven cases were given to the students. The authentic cases explored various behaviors displayed by consumers when purchasing, using, evaluating, and disposing of products and services they expect to satisfy their needs. In Week 8 and Week 14, students were asked to respond to a questionnaire that measured their lone-wolf tendency, team process, self-efficacy toward academics, and attitude and learning satisfaction with the course.

3.3. Measurements

For data collection, we adapted existing measurement tools to fit our research purpose. All measures were adopted from previous studies and used 5-point Likert scales ranging from *completely disagree* to *completely agree*.

3.3.1. Lone Wolf

To assess the collaborative work preferences of individual students, we modified seven items from Barr et al.'s [14] questionnaire. Their scale measures a student's tendency to behave as a lone wolf based on self-assessment of attitudes consistent with the lone-wolf state, including work preferences (e.g., "Given the choice, I would rather work alone than work with others"), beliefs (e.g., "I am more successful when I work by myself than when I work with others"), and behaviors (e.g., "I have little tolerance when others make mistakes"). The Cronbach's alpha value of the measure was 0.83.

3.3.2. Team Process

The items for team process were adapted from Dixon et al.'s [16] and Chowdhury et al.'s [51] questionnaire, which included affective trust, cognitive trust, autonomy, and team orientation. It was revised to incorporate a learning environment of collaborative work process in a flipped classroom. An exploratory factor analysis (EFA) with a varimax rotation was performed on the 15 items of the team process survey. A principal component analysis (PCA) was employed to extract factors from the survey. The threshold employed for judging the significance of the factor loadings of each item was 0.45. Four factors were produced as a result: Team Trust (six items), Responsibility (three items), Communication (three items), and Cognitive and Social Competency (three items). These accounted for 56.2% of the variance (see Appendix A).

3.3.3. Self-Efficacy

The self-efficacy questionnaire was adapted from the Motivated Strategies for Learning Questionnaire (MSLQ) [55]. and a total of eight items were used in this study (e.g., "I am sure that I can do an excellent job on the group tasks assigned in the course based on what I learned from the class"). The students were asked to examine their confidence in collaborative work and learning achievement in a flipped classroom. The Cronbach's alpha value of the measure was 0.80.

3.3.4. Attitude and Learning Satisfaction

A total of eight items on students' attitude and learning satisfaction towards the course were adapted from Chu et al.'s [56] questionnaire. The students were asked about their degree of satisfaction with the learning approaches (four items; $\alpha = 0.77$) and perceptions towards team learning in the flipped course (three items; $\alpha = 0.82$).

3.4. Data Analysis

First, an analysis of variables was conducted to investigate differences across teams (groups). Second, descriptive analyses and correlation analyses were conducted to examine whether team process factors predict students' self-efficacy, attitude, and learning satisfaction. Third, multiple regression analyses were employed to examine the relationship between the learning-related measures and the team process scales. Fourth, analyses of variance (ANOVAs) were conducted to examine differences between lone wolves and collaborators in terms of self-efficacy and learning satisfaction.

4. Results

4.1. Survey Responses across Teams

Table 1 presents the standardized mean scores and standard deviations from the survey, calculated for the four team process factors and lone-wolf construct. To examine differences across teams, we carried out ANOVAs and found no statistically significant differences in all scales. This result suggests that meaningful differences across teams cannot be assumed regarding the combination of preference for individual work (lone wolf) and the climate of collaborative learning (team process). Based on these results, we decided to conduct the analysis at the individual level by accumulating two sessions (n = 69) rather than at the team level.

Period	Team	N	Lone Wolf	Team Trust	Responsibility	Communication	Cognitive and Social Competency
First half	1	4	3.0 (0.66)	4.1 (0.34)	4.3 (0.47)	3.9 (0.17)	4.0 (0.27)
	2	5	2.4 (0.39)	4.1 (0.46)	4.3 (0.28)	3.5 (0.38)	4.0 (0.41)
	3	5	2.6 (0.52)	3.8 (0.68)	4.9 (0.18)	3.7 (0.83)	4.2 (0.45)
	4	4	2.8 (0.60)	3.9 (0.20)	4.8 (0.32)	3.6 (0.42)	3.9 (0.17)
	5	4	1.9 (0.38)	4.0 (0.73)	4.7 (0.27)	4.1 (0.32)	3.4 (0.74)
	6	5	2.5 (0.59)	3.6 (0.71)	4.1 (0.37)	3.3 (1.15)	3.7 (0.37)
	7	4	2.0 (0.49)	4.5 (0.44)	4.6 (0.32)	3.6 (0.88)	4.2 (0.69)
	8	4	2.3 (0.87)	4.4 (0.43)	4.9 (0.17)	4.2 (0.43)	3.9 (0.32)
Second half	9	5	2.3 (0.28)	4.1 (0.30)	4.5 (0.38)	3.7 (0.47)	3.9 (0.61)
	10	5	2.9 (0.80)	3.9 (0.81)	4.1 (0.51)	3.5 (1.12)	3.7 (0.75)
	11	4	2.7 (1.01)	3.7 (0.53)	4.6 (0.17)	3.8 (0.32)	4.2 (0.19)
	12	4	2.6 (0.41)	3.5 (0.60)	4.1 (0.63)	3.6 (0.63)	3.6 (0.32)
	13	4	2.7 (1.16)	4.4 (0.47)	4.8 (0.50)	3.9 (0.79)	4.3 (0.50)
	14	4	2.0 (0.84)	4.2 (0.75)	4.3 (0.96)	3.9 (0.63)	3.8 (0.57)
	15	4	2.5 (0.44)	3.8 (0.71)	4.3 (0.47)	3.5 (1.00)	3.2 (0.58)
	16	4	2.1 (0.87)	4.2 (0.75)	4.6 (0.83)	4.0 (0.94)	4.0 (0.98)

Table 1. Mean and standard deviations of each team in lone-wolf and team process scales.

4.2. Descriptive Statistics and Correlation of Variables

Table 2 presents the Pearson correlation coefficients of lone-wolf team process scales, self-efficacy in the subject, attitude toward flipped learning, and learning satisfaction. Regarding the relationship between the lone-wolf scale and the other measures, only team trust showed a significant negative correlation with lone wolf, r(67) = -0.34, p = 0.004. Overall, there were strong positive relationships among team process scales, with correlation coefficients ranging from 0.27 to 0.46. Self-efficacy in the subject demonstrated positive relationships with communication, r(67) = 0.52, p < 0.001, responsibility, r(67) = 0.38, p = 0.001, team trust, r(67) = 0.28, p = 0.018, and cognitive and social competency, r(67) = 0.25, p = 0.037. Attitude toward flipped learning showed a positive relationship only with responsibility, r(67) = 0.26, p = 0.032. Learning satisfaction showed positive relationships with attitude, r(67) = 0.51, p < 0.001 and self-efficacy, r(67) = 0.36, p = 0.003.

	M	SD	1	2	3	4	5	6	7	8
1. Lone wolf	2.47	0.672	-							
2. Team trust	3.99	0.589	-0.342 **	-						
3. Responsibility	4.47	0.496	-0.186	0.265 *	-					
4. Communication	3.72	0.691	-0.176	0.334 **	0.462 **	-				
5. Cognitive and social competency	3.86	0.555	-0.026	0.380 **	0.435 **	0.294 *	-			
6. Self-efficacy	3.79	0.431	-0.204	0.284 *	0.375 **	0.518 **	0.251 *	-		
7. Attitude	4.39	0.476	-0.13	0.039	0.258 *	0.104	0.19	0.202	-	
8. Learning satisfaction	4.28	0.571	-0.199	0.187	0.083	0.123	0.039	0.357 **	0.505 **	-
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Table 2. Correlation coefficients and descriptive statistics of measures.

Note: N = 69. * p < 0.05. ** p < 0.01.

4.3. Team Process as Predictors of Self-Efficacy and Attitude

Multiple regression analyses were conducted to examine the predictive relations between the learning-related measures and team process scales. Regression related to selfefficacy revealed that communication was a positive predictor of self-efficacy, F(1, 67) = 24.6, p < 0.001 ($\beta = 0.52$). Regression related to attitude revealed that responsibility was a positive predictor of attitude, F(1, 67) = 4.77, p = 0.032 ($\beta = 0.26$).

4.4. Lone-Wolf Effects on Self-Efficacy and Learning Satisfaction

Considering these findings, further analysis was conducted to examine lone-wolf effects on the learning-related measures by categorizing students into "lone wolves" if they rated at or above the mean on the lone-wolf scale and "collaborators" if they rated below the mean. Lone wolves (N = 32, M = 3.03, and SD = 0.441) rated significantly higher than collaborators (N = 37, M = 1.98, and SD = 0.404) on the lone-wolf scale,

F(1, 67) = 105.7, p < 0.001, and $\eta_p^2 = 0.61$. The ANOVAs revealed a marginally significant main effect of grouping on learning satisfaction, F(1, 67) = 2.89, p = 0.094, and $\eta_p^2 = 0.04$. This revealed collaborators (M = 4.4 and SD = 0.52) expressed higher satisfaction than lone wolves (M = 4.2 and SD = 0.61) regarding their learning. There were no main effects on self-efficacy F(1, 67) = 1.47, p = 0.23 and attitude F(1, 67) = 0.76, p = 0.39.

5. Discussion

Multiple factors have been identified in the previous literature as critically impacting team learning in traditional classrooms, such as learners' individual characteristics and team diversity [13,57]. However, little attention has been paid to how learners' work preferences and team processes impact team learning in a flipped classroom. To investigate this important aspect, the current study identified team process factors that might predict learning outcomes and explored the effectiveness of work preferences (collaborative vs. lone-wolf tendencies) on self-efficacy and learning. The findings of this study demand further discussion and investigation in several areas.

First, among the team process factors, team trust positively correlated with responsibility, communication, and cognitive and social competency. These results are consistent with previous studies that have identified team trust as an essential factor allowing teams to function smoothly and perform effectively [36,58,59]. For example, in Kwon et al.'s [49] study, successful group interaction patterns were explored, and "trust and solidarity" was identified as an essential factor behind group processes such as cohesion and enhanced collaborative behavior. According to the social interdependence theory, social interdependence occurs when the achievement of an individual's goal is affected by the actions of others [45]. Positive interdependence exists when individuals encourage peers to complete tasks to reach group goals that require mutual help and trust. Team trust is built on individuals' reliance on each other, confidence in the others' ability, and willingness to help meet set targets. This trust is what enables members to comfortably express and negotiate alternative viewpoints, leading to collaborative decision making and thus successful teamwork [60]. From this perspective, we can conclude that trust is a critical element in facilitating teamwork processes such as allocation of individual responsibilities, effective communication with team members, and engagement in in-class activities in a flipped learning course.

With regard to team trust and lone-wolf tendencies, we found that there is a significant negative correlation between the two, implying that students with lone-wolf tendencies may not trust team members during collaborative work. This is in line with Barr et al. [14], who found lone wolves prefer to work independently since they lack trust in others to complete tasks. A team with a low level of trust requires extra effort to be made to monitor members to foster effective group functioning [12]. Considering team trust is a key variable in facilitating group process and performance, it is necessary to help lone-wolf students understand that achieving learning goals is only possible through the committed work of all individuals on the team. It is also necessary for team members to work with lone-wolf members, so scaffolding should capitalize on individuals' characteristics such as their strengths as collaborators or lone wolves. Thus, an instructor planning to implement teamwork in an in-class activity for flipped learning needs to consider their students' work preferences and provide guidance that engages lone wolves in teamwork processes.

Lastly, we found that collaborators showed higher satisfaction than lone wolves regarding their learning in a flipped classroom, but no significant difference was found in self-efficacy and attitude. It is not surprising that collaborators were satisfied with the flipped learning course, since it required several collaborative tasks as in-class activities. As for the students with lone-wolf tendencies, they might not have actively engaged in or enjoyed the team learning; on the other hand, they seem to have fulfilled their given responsibilities in collaborative tasks and learned individually, resulting in no difference in self-efficacy and attitude towards the course. This may have been due to the positive traits of lone wolves. Previous research has suggested students with lone-wolf tendencies are

likely to devote drive to a task but spend little energy on interactions with peers on the team. Shankar and Seow [17] reported there was no significant relationship between lone-wolf tendencies and team performance, and that the lone wolf trait may have led to actually taking on greater responsibility in teamwork, leading to better learning engagement in the team task and team processes. However, the authors also highlighted the perception of some students grouped with a high proportion of lone wolves that their team had performed poorly. In this sense, a team consisting of only a certain proportion of lone wolves may function properly, and team process and learning outcomes may not be critically impacted.

Another possible explanation for why there was no difference between collaborators and lone wolves in self-efficacy and attitude is the nature of their in-class activity. Students were asked to learn key concepts and theories by watching lecture videos and reading material before class as part of their individual activities. However, during the in-class activity, though students were involved in teamwork, in-depth communication and collaborative work were not required. For example, they were required to identify problems, research relevant materials, decide on the best solutions, and create presentation materials for case-based learning. A new case was given each week, and the students only needed to collaborate on the task during the 3 h class, which may not have required a high level of interpersonal skills. Because of this characteristic of the team tasks, there may have been no difference between collaborators and lone wolves in their self-efficacy and attitude towards the flipped learning course. If the students had been involved in a team-oriented task or project that required more in-depth communication over a period of weeks, the result may have been different. Considering this, the level of collaboration in tasks may more critically impact students' self-efficacy and attitude, especially for lone wolves, during teamwork. To identify how to better support teamwork along with students' work preferences, further research is needed in this area.

6. Conclusions

This study contributes to the literature by examining the relationship among team process factors, lone-wolf tendencies, and learning outcomes (self-efficacy and attitude) in a flipped learning classroom. It confirms that team trust is an important factor in effectively engaging students in teamwork. In addition, although students' work preferences (collaborative vs. lone-wolf tendencies) can affect team learning processes, the way tasks are designed and how students are grouped may facilitate their engagement in the learning process in a flipped learning course.

There are several limitations in this study worth addressing in future studies. First, the sample size was relatively small and focused on business students, so further research should articulate the findings with larger samples in different settings. Second, based on our findings, future research should provide guidelines for deeply engaging both collaborators and lone wolves in their team process by analyzing in-depth qualitative data on students' behaviors and perceptions. Instructional strategies may also affect group interactions, so instructors may employ various mechanisms to help lone wolves be more engaged in teamwork (e.g., activities designed to build trust between team players). In addition, of particular interest is the relationship between lone-wolf tendencies, task performance, and other variables that mediate or moderate this relationship. For example, what are the patterns of collaboration between lone wolves and team players? How can we scaffold students with lone-wolf tendencies to effectively engage them in their teamwork?

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Table A1. Rotated component loadings and factors extracted from the team process survey.

Questions	2	Factor Loading					
1	-	3	4				
Factor 1: Team Trust							
When making decisions, I consider other opinions and try not to be domineering.0.93							
For the benefit of all, I do not insist on my own opinions. 0.64							
I help and encourage team members who take responsibility of heavy and difficult tasks. 0.56							
When there is a conflict, I take an objective position rather than going along with one side. 0.55							
I compliment team members who do well and try to learn from their performance. 0.46							
I encourage and thank team members who carry out a difficult task or solve a problem. 0.46							
Factor 2: Responsibility							
I always fulfill the responsibilities assigned to me when working in groups.	0.95						
I work well as a team player when working in groups.	0.68						
Without making excuses, I am willing to do my part for the good of any team that I am a part of.	0.45						
Factor 3: Communication							
I can address my opinions clearly and persuasively.		0.90					
I can summarize complex tasks and difficult ideas to be easily understood.		0.65					
I can utilize graphs, diagrams, and illustrations for a presentation.		0.59					
Factor 4: Cognitive and Social Competency							
I analyze and synthesize data collected from various sources (e.g., books, articles, Internet, etc.).			0.79				
I review various materials related to the team project to fulfill my responsibility.			0.68				
I use my knowledge and skills from multiple perspectives to perform team tasks.			0.57				

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