The Influence of Self-Efficacy in Project Groups on Collaboration Experience and

Participation Distribution

Néle Meese

University of Twente

Faculty of Behavioural, Management and Social Sciences TBA

M12 BSc Thesis PSY (2022-2A)

Dr. Judith ter Vrugte

June 23, 2023

APA 7th

The Influence of Self-Efficacy in Project Groups on Collaboration Experience and Participation Distribution

Abstract

Numerous studies have discovered that individual self-efficacy levels in groups have a significant impact on the collaborative experience and engagement of individual group members. Nonetheless, the results of other studies appear to be inconclusive regarding the effect of self-efficacy levels in various groups. To ensure the optimal learning outcome, it is important to gain additional clarity on this subject. Therefore, this study demonstrates how self-efficacy levels in project groups affect the amount of participation and collaboration experiences. It was expected that project groups with equal self-efficacy levels experience a similar collaboration experience and an equal distribution of participation and that groups with mixed levels of self-efficacy have varying levels of collaboration experience and participation. Participants who were students following a specific module had to complete two online studies within a six-week timeframe. The analysis of the data showed no significant effect of self-efficacy levels on participation or collaboration. The finding of the study can help to improve collaborative learning experiences and provide suitable support for students, instructors, and institutions. To improve our knowledge of self-efficacy and collaboration in project groups, future studies should investigate underlying variables impacting collaboration.

Keywords: collaborative learning, self-efficacy, collaboration experience, group work distribution

Introduction

Nowadays, an increasing number of universities support and promote collaborative learning and working (Wolverton et al., 2020). Nevertheless, collaboration is not always effective. A study by Vancouver and Sawilowsky (2000) showed that 44 per cent of students report that they felt like they were contributing more than their peers in the collaboration. Unequal contributions and unpleasant experiences in collaborative work can lead to decreased motivation and achievement among team members, affecting project effectiveness (Lee et al., 2014). Moreover, another study found that this can also harm the overall outcome of group work (Mullen et al., 2013). According to DeBourgh and Towle (2014), negative collaboration experience causes reduced participation, which can affect the willingness to participate in further collaboration negatively. The specific problem addressed is the potential negative impact of unequal collaboration experiences and participation distribution within project groups. In order to guarantee the best possible learning experience underlying factors of collaborative learning have to be taken into account. An important factor that influences collaboration is the individual self-efficacy level of the group members, which could harm or benefit the collaboration experience and participation (DeBourgh & Towle, 2014). This is due to the fact that self-efficacy is predicting how much an individual believes in themselves (Mustafa et al., 2019). Current research, however, is primarily concerned with the use of collaboration to maximize knowledge growth (Dehler et al., 2011; Wecker & Fischer, 2014). As a result, the majority of research has concentrated on methods and analyses of gaining mostly techniques used for collaboration for instance computer-based collaborative learning tools; significantly less attention has been placed on other factors that impact students, such as their individual self-efficacy levels. This might lead to the formation of disagreements and debates within the group, thus limiting collaboration.

Insights on self-efficacy levels in project groups might establish a more equitable and plesant collaboration experience for all group members as it might influence participation and collaboration experiences of group members and therefore have an effect on the whole group.

Theoretical Framework

Self-efficacy is a significant aspect in predicting a successful collaboration experience (Hog et al., 2012). Self-efficacy is an individual's belief in their capacity to act in the ways necessary to reach specific goals (Bandura et al., 1999). Individuals with high self-efficacy levels believe that they are able to do well on a given task, while individuals with low levels of self-efficacy believe that they are not in control of their actions and therefore will perform poorly on a given task. Self-efficacy plays a crucial role in project groups as it influences the level of participation and collaboration experience among members (Yadav et al., 2021).

Collaboration Experience and Self-Efficacy in Groups

The collaboration experience of a group is influenced by the individual self-efficacy levels of the project group members (LePine et al., 2008). Collaboration experience derives from group work in which individuals work together with a shared goal or to create a product (Zimbrano et al., 2019). Several studies have found that self-efficacy levels in groups have a manifold influence on creating a positive or negative collaborative experience. Bandura et al. (1999) discovered that students with higher self-efficacy levels believed that their group was more productive which supported the collaboration and lead to a positive experience. Nevertheless, higher does not always imply better. Other studies have shown that group members who score extremely high on self-efficacy are more likely to dominate the collaboration (Huang et al., 2014). This might be viewed as unpleasant by the other group members and is especially undesirable in education where we aim for equal participation and

sometimes even rely on it. Hence, a rather negative collaboration experience might exist in these groups (Huang et al., 2014). A factor that can enhance the collaboration experience is familiarity with other group members before the start of the group work (Janssen et al., 2009; Stark & Bierly, 2009).

Participation and Self-Efficacy in Groups

Self-efficacy and familiarity among group members are also crucial elements when it comes to participation in the group. Khong et al. (2017) believe that there is a relationship between self-efficacy and participation in a group. Higher self-efficacy among students leads to increased participation in group projects which improves the overall learning results (Khong et al., 2017). Yang and Wang (2017) uncovered that group members with higher self-efficacy levels were more likely to participate in group discussions or to provide feedback to other group members. Mierzejewska and Radziszewska (2014) found similar results; group members with higher self-efficacy showed more participation and saw the group as a unit. Conversely, group members with low self-efficacy levels may be more likely to participate less actively in the group's activities (Fuchs et al., 1999). Correspondingly, a study conducted by Lee et al. (2014) discovered that students with lower self-efficacy were less likely to participate in the project group work. This might result in an unequal distribution of group work.

On the other hand, the results of a study conducted by Khong et al. (2017) are contradictory as they found that students with higher self-efficacy levels' willingness to participate in the group decreases and their task performance is lower. Therefore, higher self-efficacy levels do not always imply that the group necessarily benefits from them, and they could also lead to unequal participation in the group. This might be caused because students who are

high in self-efficacy might disrupt group participation by choosing to do tasks rather individually and not engage in group discussions as much (Roscoe & Chi, 2007).

It has been found that participation and self-efficacy levels seem to be reciprocal. Equal participation is important for a successful collaboration and is thus important to access (Mumtaz, 2000). It has many different underlying factors which are also manifold to consider. Jo and Dennen (2017) believe that there are three main underlying factors, namely responsibility, effort and backing-up behaviour. Responsibility includes the fulfilment of individual duties in the group, effort refers to a genuine attempt to participate in a group activity or task and backing-up can be understood as efforts that focus on helping other teammates with their portion of the work to produce a successful group outcome (Jo & Dennen, 2017). It is suggested that individuals with higher self-efficacy may be more likely to take on individual responsibilities, put in greater effort towards group tasks, and assist other group members in completing their tasks (Jo & Dennen, 2017). According to research, people who have higher levels of self-efficacy are more likely to take on individual responsibilities, exert more effort in group projects, and help other group members complete their tasks (Jo & Dennen, 2017). For this reason, Mendolia et al. (2018) advocate creating mixed-level self-efficacy groups as a potential strategy for fostering successful collaboration.

Grouping

By giving students the chance to share ideas, encourage one another, and work together to accomplish common goals, grouping serves to enhance effective communication and improve the learning experience (Webb-Williams, 2021). The dynamics of collaboration and the overall effectiveness of group work may be influenced by group membership, which can include aspects like individual self-efficacy levels (Hammouri & Abu-Shanab, 2018). Literature has divided

opinions about which grouping fosters the best group work and outcome. Schullery and Schullery (2016) regard the diversity of characteristics as one of the most generally acknowledged characteristics of successful collaboration. Mendolia et al. (2018) also strongly advocate the importance of groups with mixed levels of self-efficacy since they performed better and achieved higher ratings. Still, previous research contradicts these findings and connects more similar self-efficacy levels in a group to high levels of happiness (DeWitz & Walsh, 2002; Hammouri & Abu-Shanab, 2018)

Current research has shown that equal participation and collaboration are crucial as this is impacted by how students are grouped with self-efficacy playing a major key variable. Still, there appear to be a lot of contradictions in the previous findings. Results seem ambiguous which demonstrates why research is highly relevant in this area.

Current study

As mentioned, the self-efficacy levels of group members are crucial factors in collaborative learning. They seem to affect the collaboration experience and participation within a group (Khong et al., 2017; LePine et al., 2008). Despite the considerable amount of research conducted on this matter (e.g., Khong et al., 2017; LePine et al., 2008; Zimbrano et al. 2019), there appears to be some discrepancy in the findings regarding the impact of self-efficacy levels in groups with different levels. Consequently, it is important to remember that the impact of self-efficacy levels in groups can vary depending on the specific context, task, and other factors at play. The results of the available research suggest that the effect of self-efficacy levels in project groups is not fully conclusive. Yet the majority of evidence supports the idea that project groups with similar self-efficacy levels may lead to more equal collaboration experiences and participation distribution (LePine et al., 2008; Mierzejewska & Radziszewska, 2014; Yang &

Wang, 2017). The present study aimed to investigate the influence of different levels of individual self-efficacy levels of group members in relation to the quality of collaboration and distribution of work. The target group were Dutch university students in the second year of a three-year Psychology Bachelor programme. This was specifically chosen because each student had to write a joint section of a paper together in a group. The research question was: 'To what extent does self-efficacy influence the distribution of participation and the collaboration experience in project groups?' It was hypothesised that *'Project groups with equal self-efficacy levels will experience an equal collaboration experience and an equal distribution of participation'*. This implies that a project group in which everyone has equally high levels of self-efficacy will have a similar high collaboration experience and participation during their group work. The second hypothesis stated, *'Project groups with mixed levels of self-efficacy will have varying levels of collaboration experience and participation'*. In the conducted study there were two measurement moments where students fill out two questionnaires within a five-week timeframe. The first questionnaire had to be filled out at the beginning of the collaboration of the groups' joint section which solely focuses on self-efficacy. The second questionnaire had to be completed by the end of the joint section and focuses on self-efficacy, collaboration experience and participation.

Methods

Design

Both questionnaires were created using Qualtrics XM. This study followed a quantitative online study design with two measurement moments within a five-week time frame. Hence the focus was mainly on the groups which were viewed as cases. The independent variable is the level of self-efficacy measured at two-time points which were regarded as pre-and post-tests. The

dependent variables were collaboration experience participation distribution and general group participation measured at the second time point. Moreover, the demographic characteristics of age, nationality, gender, and level of education were collected.

Participants

A minimum age of 18 was required to participate in the survey, in addition to agreeing to informed consent. The inclusion criteria were that the students had to be in Module 7 of the psychology bachelor programme. If participants decided to take part via the Sona system, they got rewarded with points which are necessary to complete their bachelor's degree. To make use of the data at least 80 per cent of the group had to fill in the questionnaires individually. In total 10 groups participated in the first measurement moment and seven groups participated in the second measurement moment. Three groups had to be excluded since they did not meet the 80 percent criterium. Of the included respondents, the mean age was 21.71 years old (SD = 2.43), and the reported gender distribution was 35 females, 13 males, and 1 no binary/other in the first measurement moment. In terms of nationality, 31 indicated being German, 10 Dutch, 1 Bulgarian, 1 Chinese, 1 Latvian, 1 Polish, 1 Portuguese and 3 Spanish in the first measurement moment. Furthermore, regarding the participants' level of education, 43 respondents indicated college/A levels, 3 secondary school/GCSE, 3 undergraduate degrees (BA/BSc/other), and 3 graduate degrees (MA/MSc/MPhil/other). Due to participant attrition, the second measurement moment consisted of 32 individuals, with 23 identifying as female, and 9 as male. At the second measurement moment, 14 students (who previously indicated having an undergraduate degree, 2 undergraduate degrees (BA/BSc/other) and 1 with a graduate degree (MA/MSc/MPhil/other)) did not complete the questionnaire.

Materials

After the ethical approval was permitted by the Ethics Committee of the University of Twente the questionnaires were entirely hosted on Qualtrics.

Demographic Questions

Demographic questions included the participants' age, nationality and gender (Appendix A). Additionally, the level of education was assessed to determine whether students had additional degrees or another educational background. To investigate if there were any differences between individuals who were familiar with their project group and those who were not, familiarity with the group was assessed. In order to identify in which groups, the students participated, it was asked for the number of people in their group, project group name, supervisor and their individual participant number. The individual participant number was specifically taken into account to match the participant to the first and second questionnaires of the two measurement moments.

Self-efficacy

The General Self-efficacy scale was adjusted and connected to the self-efficacy in project groups which was developed by Bandura (1977). This scale is a psychometric instrument designed to assess an individual's overall beliefs in their capacity to deal with a wide range of obstacles and accomplish activities. It evaluates a person's total sense of self-efficacy, which relates to their belief in their ability to effectively execute the actions required to create desired results. To ensure that self-efficacy was only measured in the context of the student's collaboration 'In my project group' was added in front of every question. Students were asked to respond to 10 statements with a 4-point scale from 'Not at all true' which scores one to 'Exactly true' which scores 4 (Schwarzer, 2012). Therefore, participants can score from 1 to 4. An

example question from this questionnaire was: 'In my project group, I can always manage to solve difficult problems if I try hard.' The scale appeared to be reliable in the first questionnaire, with Cronbach's alpha ($\alpha = .89$) and in the second questionnaire ($\alpha = .9$). Thus, at both measurement moments the reliability turned out to be very good. In this study, mean scores were calculated which ranged from 1 to 4 and 3 to 4 is considered as high, and from 1 to 2 as low (Schwarzer, 2012).

Collaboration experience

Collaboration experience was measured with the help of nine adjusted items of the Teamwork Satisfaction Scale (Ku et al., 2013). This scale is used to assess an individual's contentment with their experience in a collaborative context. It measures group members' subjective evaluations of the quality and efficiency of their collaboration. For example, 'I gain collaboration skills from the teamwork processes'. One question was excluded as it focused solely on online collaboration. The final question was adjusted by not including the word 'online'. Participants were asked to answer these questions on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Mean scores were calculated per participant (range 1 to 5). A score of 3 to 5 is deemed high, whereas a score of 1 to 2 is considered poor (Ku et al., 2013). Cronbach's alpha ($\alpha = .87$) indicated a very good level of reliability.

Group Work Contributions

In order to measure group work contribution, the Group Work Contribution Scale (Joo & Dennen, 2017) was used. This questionnaire consists of 12 questions divided into four subcategories namely effort, initiative, responsibility and backing-up behaviour. This scale is used in academia to evaluate students' contributions to group work across a number of group tasks and assignments. The questionnaire aimed to identify equal contributions. An example

question was: 'During my group work I, made the best use of my ability to accomplish a group project'. Students were asked to answer these questions on a 5-point Likert scale. Mean scores (range 1 to 5) were determined; a score of 3 to 5 is regarded as high, while a score of 1 to 2 is considered low (Joo & Dennen, 2017). The corresponding reliability value turned out to be very good ($\alpha = .87$).

General Group Performance

To evaluate the performance of the whole group. The general group performance was a self-constructed questionnaire with six items such as 'During the project, everybody participated in group discussions. This scale was designed to evaluate the group's performance as a whole. Students were required to identify to what extent the entire group participated and contributed to the collaboration. The scale was based on the category's effort, responsibility, and backing-up behaviour. According to Joo and Dennen (2017), these are the key elements of group work contribution and performance. Every category was represented with two questions. An example statement of the effort category was 'Everyone worked to the best of their abilities'. 'Everyone performed their required duties' was an example of the responsibility category. Backing-up behaviour was measured with statements like 'Everyone assisted each other'. The scale of general group performance indicated to be very reliable ($\alpha = .9$) with a 5-point Likert scale. Mean scores were computed for this scale, which ranged from 1 to 5, with 3 to 5 regarded high and 1 to 2 considered low.

Validity. In order to establish the validity of the self-constructed scale General Group Performance, a factor analysis has been performed. After checking the Eigenvalues, it could be concluded that the factor analysis had to be a single factor (Figure 1). Specifically, the output of the analysis showed the factor loadings of each item regarding one single-factor. Consequently,

if the items would have a factor loading of around .50 or higher for the single factor, it indicates that the items measure only one concept (Kline, 2014). The output of the single factor analysis of the items appeared to have loadings around .70 or higher on all items. Therefore, it could be concluded that the questionnaire that was used to measure the general group performance did contain high construct validity.

Figure 1

Scree plot of the distribution of eigenvalues
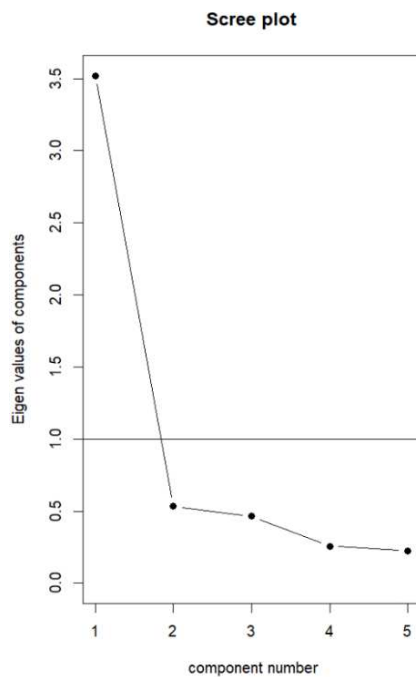
Procedure

After the ethical approval was permitted by the Ethics Committee of the University of Twente the questionnaires were entirely hosted on Qualtrics for the sake of data collection. The sample was collected using the snowball sampling method and Sona studies. To that end, the researcher shared the study with their available contacts who fulfil the inclusion criteria. Additionally, the researcher sent emails to every supervisor from module seven to promote the

study and asked them to tell their students about the study and request each group member's participation. Moreover, the study was put online at Sona studies, which is an online platform for psychology and communication science students studying at the University of Twente where they can participate in different studies. The study was conducted online and took around 15 minutes in total to complete. The participants had to complete two parts in order to finish the study. There were two points in time at which students had to complete the questionnaire. The first one was at the beginning of the collaboration of the joint section and the second one was at the end of their collaboration of their joint group project (Appendix A). Both questionnaires had to be completed within a 5-week time period.

The first part of the study consisted of a questionnaire that had to be filled out at the beginning of the data collection of the group which took around eight minutes to be completed. Within the questionnaire, participants had to indicate their demographics and individual differences regarding their project groups, familiarity with their group members and amount of group members. In order to tell the different participants apart in both questionnaires participants had to create an individual name consisting of the first three digits of their student mail and their birth month. This was followed by a questionnaire about the self-efficacy levels of the students in their project group as a pre-test. The decision was made not to have any scales about group work contributions and collaboration in the first questionnaire as at that point in time the groups might not have worked together a lot.

Since self-efficacy can change over time participants were asked to complete a second questionnaire at the end of their joint data collection. Within the questionnaire, the participants were asked again about their self-efficacy in the group as a post-test, the group work contributions and the collaboration experience. Moreover, they had to indicate their individual

name which they gave themselves in the first questionnaire in order for the researcher to match them with the first questionnaire. Furthermore, they also had to state the number of students in their project groups who dropped out of their group. Hence, the second measurement moment is more important than the first one, participants who did not participate in the first one were also eligible to take part in the second measurement moment but had to fill out their demographics at the beginning of the questionnaire. In terms of the place of the scheduled meetings, all 49 students indicated that their meeting takes place online and offline.

Data Analysis

The data analysis was performed in RStudio (2023.03.0+386). The packages that were applied were tidyverse, readr, foreign, psych, janitor, magrittr, dplyr, mirt, broom, modelr, gplot and DescTools. After having determined the final dataset; Cronbach's Alpha was computed to test the reliability of the data. From .60 on the scale could be seen as reliable data (Bonett & Wright, 2014). To get an overview of the data a correlation analysis between the self-efficacy scale scores, participation distribution and team satisfaction scale scores was performed. Finally, in order to test the hypotheses a qualitative approach was used since there was no statistical power with seven project groups. In this approach, the project groups were viewed as cases and were examined separately and compared after.

<div align="center">Results</div>

Descriptive Statistics

After omitting the respondents with missing values which were students who missed one measurement and project groups with less than 80% a total of 49 participants for the first questionnaire and 32 participants for the second questionnaire analysis were included. The descriptive statistics of the collaboration experience, participation and general participation and

the self-efficacy scores of the pre-and post-test are displayed in Table 1.

Table 1

Descriptive Statistics of the collaboration experience, participation, and group participation

	N	M	SD	Range
Self-efficacy Pre-test	49	2.88	0.62	1.60-3.80
Self-efficacy Post-test	32	3.20	0.52	2.10-3.90
Group Work Contributions	32	4.24	0.49	3.25-5.00
Collaboration	32	3.92	0.58	2.78-5.00
General Group Performance	32	3.98	0.62	2.33-5.00

General Correlation

To examine the general relationship between self-efficacy, collaboration experience, group work contributions and general group performance a Pearson correlation matrix was constructed. The correlation between the scales self-efficacy and general group performance turned out to be significant, $r(30) = -0.97$, $p = .03$. Hence, as self-efficacy increases, the general group performance tends to decrease. Similarly, general group performance was negatively correlated with participation, although the relationship was moderate, $r(30) = -0.98$, $p = .02$. This suggests that participants who scored high on the general group participation performance scale, tend to score lower on the group work contributions scale. The correlation between the other

scales was found to be insignificant with $p = .140$ or higher.

Hypothesis testing

In contrast to the correlation testing a qualitative approach was used to evaluate the hypotheses, assessing the individual mean scores of the self-efficacy scale within each group. Insights were gathered by examining the individual mean scores of the various scales while accounting for the appropriate group. It was found that five project groups showed mixed levels of self-efficacy and two project groups showed similar levels of self-efficacy. Here, the self-efficacy levels measures of the post-test were taken into consideration. Groups in which students showed both high and low self-efficacy levels were referred to as mixed, whereas groups with similar self-efficacy levels were defined as equal. An overview of the equal self-efficacy levels per group is shown in Figure 2 and of the mixed self-efficacy levels per group can be found in Figure 3.

Figure 2

Boxplots of the similar self-efficacy scores
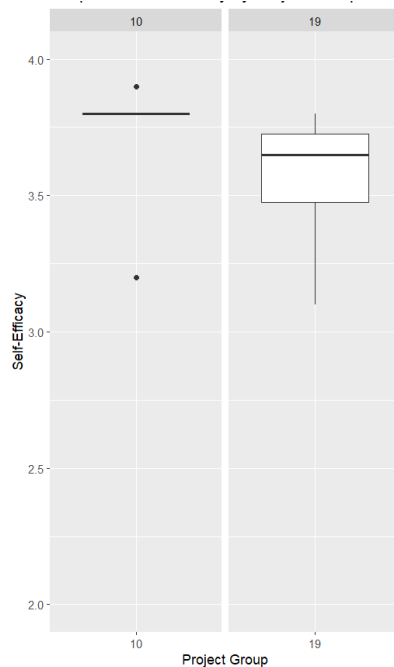
Figure 3

Boxplots of the different self-efficacy scores
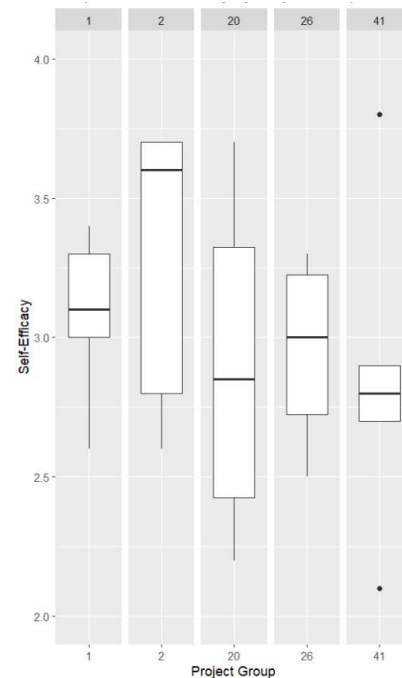
The hypothesis *'Project groups with equal self-efficacy levels will experience an equal collaboration experience and an equal distribution of participation'* could not be answered as the data is inconclusive. Project groups 10 and 19 indicated having equally high self-efficacy levels. One of the project groups showed mixed levels when it came to collaboration experience and group work contributions. Contrary the other project group indicated having equal levels of collaboration experience and group work contributions.

The second hypothesis '*Project groups with mixed levels of self-efficacy will have varying levels of collaboration experience and participation'* was also rejected. Two out of the five project groups with mixed levels of self-efficacy showed equally high levels of collaboration experience and distribution of participation. Three of the mixed self-efficacy level groups had very mixed levels, for instance, groups 20 and 26 in which two people displayed low levels and

two high levels of self-efficacy.

**Trends in groups with similar self-efficacy mean scores**

To gain more insight into the particular findings linked to collaboration experiences and group work contributions within project groups trends of project groups with comparable self-efficacy levels need to be looked at. In project group 19, members indicated similar means compared to the first survey all of their self-efficacy levels went up at least 0.5 with. In this project group collaboration experiences were also higher than 4.22 and equal group work contributions were 4.17 or higher. Moreover, for three group members, the means of group work contributions and general group performance were exactly the same. In project group 10, the mean collaboration score across group members was mixed. Despite the general group performance being equally high for every group member, there was a noticeable fluctuation in the general group performance. This suggests that while the general group performance of the project group was high, there were differential perceptions among group members regarding the equal distribution of workload and contributions.

Trends in groups with mixed self-efficacy mean scores

In groups 2 and 20 one self-efficacy mean stayed the same for both questionnaires. These were also the only two groups in which one group member scored 5.00 on the participation scale (Figure 4). Group 20 is shown in black in this figure, and group 2 is displayed in grey. In group 41 four people had low levels while one had high levels of self-efficacy. This was the contrary in group one where only one person had a low level of self-efficacy while the others had high levels. This group was the only group in which the mean score of the general group participation scale revealed varying low and high results with 2.33 being the lowest and 4.67 being the highest.

Figure 4

Self-efficacy and Group Work Contribution mean scores of project group two and 20
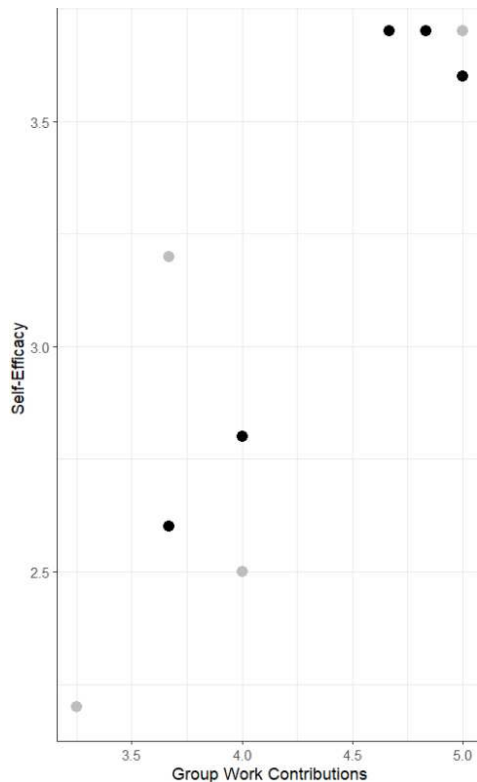
Note. In this Figure group 2 is represented in grey and group 20 is represented in black

Discussion

The present study aimed to investigate whether individual self-efficacy levels have an influence on collaboration experience and participation in project groups. To answer the research question 'To what extent does self-efficacy influence the distribution of participation and the collaboration experience in project groups? '.

Firstly, it was hypothesised that project groups with similar self-efficacy levels experienced a similar collaboration experience and an equal distribution of participation. As the results indicate this hypothesis cannot be answered since the results revealed to be inconclusive. This is due to the fact that the findings were indefinite to support or reject the hypothesis. The

reasons for this were the limited sample size and the inability to control what self-efficacy levels group members possess. Therefore, one of the groups showed similar results as the study of Khong et al. (2017) in which students with higher self-efficacy participated more in group projects, which enhances the collaboration experience of the whole group. Contrary to that the other project group had high self-efficacy levels but mixed collaboration experiences and group work contributions. Huang et al. (2014) believe that this could be since these students seek to demonstrate their unique skills while working collaboratively, group performance could be compromised.

Secondly, it was hypothesised that project groups with mixed levels of self-efficacy have varying levels of collaboration experience and an unequal amount of participation. This hypothesis was also rejected because all the mixed project groups indicated equally high levels of collaboration experience and participation. This finding contradicts earlier work which states that students with lower self-efficacy are less likely to participate in project group work and have more negative collaboration experiences (Lee et al., 2014). This could be explained by the fact that in this study students were already familiar with each other which is in contrast to the study of Lee et al. (2014) in which participants did not know each other before the start of the study.

Additionally, results showed that general group participation was negatively correlated with self-efficacy. Hence, as self-efficacy increases the general participation of the group is decreasing. This is in line with Khong et al. (2017) who state that students with greater self-efficacy levels are less engaged in groups and perform worse on tasks distributed to them in group settings. Similarly, it was found that general group participation was negatively correlated with group work contributions. Consequently, as participation scores increase, the general group participation decreases. These results seem to indicate that group performance will be affected

when a student in a group is overconfident and may seek to highlight their own skills throughout the collaborative task. This assumption is in line with Stone (1994) who has shown that self-efficacy beliefs might result in overestimations of one's own skills, which could in turn lead to overconfidence. These individuals perform tasks poorly given that they are more likely to make logical mistakes, lack motivation and contribute fewer resources to the task (Stone, 1994; Vancouver & Kendall, 2006). These results are in contrast with the findings from Christens et al. (2016) who discovered that self-reported participation is weakly positively correlated to general participation, meaning that self-reported participation tends to align with overall group participation.

Limitations & Recommendations for Future Research

The conducted study has shown to have strengths and limitations which should be considered for future research. The self-reporting may have added some social desirability bias. This is also shown in the results as students generally reported their group work contributions higher than the general group performance. Paulhus (2002) notes that social desirability can negatively impact the validity and reliability of research results. Since students had to self-report their individual participation and collaboration experience it is questionable whether their answers were biased. To control for self-report bias students could also rate each other's collaborations and participation within the group.

The study's design made it convenient to gather more participants as the researcher was also able to contact the supervisors of the project groups and most of them asked for the student's engagement in the study. However, an aspect that could have affected the reliability of data is that some supervisors changed the names of their studies. So, when filling out the questionnaire some participants got confused as to which project group they belonged to and dropped out of

the study. This might be a reason for the high dropout rates which occurred while participants filled out the first questionnaire. Further participants dropped out of the study after completing the first questionnaire. Hence, there is the chance of selection bias as not all members of the group engaged in the study and not all project groups participated (Tripepi et al., 2010).

A recommendation is the homogenous target group. In this study it was the chosen target group of psychology students from a Dutch university in the second year, which is a distinct homogeneous group. The main benefit of homogenous groups is that they are more generalizable (Jagger et al. 2017). Additionally, all project groups have online and offline meetings. This improves the internal validity of the findings since every project group had to deliver similar projects with similar evaluation criteria (Pourhoseingholi et al., 2012). Nonetheless, a limitation of that is the sample size. Thus, with the small sample size in this study the data was lacking statistical power. Hence, the target population's variety might be poorly represented (Cintina & Potluri, 2021). Reasons for the amount of participation could be that some project group members might have missed the study as they did not use the Sona platform. Their supervisor might have not shared it with them, or they were not informed by other group members.

Moreover, many underlying factors were not taken into account in this study. Implementing open questions after each scale where participants can indicate why they made certain choices and what influences their willingness to collaborate and participate could reveal these. Thus, other scales could be added to the questionnaire measuring individual differences, for instance, a scale measuring motivation as studies have shown that it is linked to self-efficacy (Bedel, 2015; Husain, 2014).

Additionally, the study's target group restricts the findings' applicability to a larger population. This is supported by the fact that the study was held online and therefore

participation is limited to those with enthusiasm to voluntarily participate (Alharbi & Alshehry, 2019). Furthermore, for future investigation, a bigger sample is preferred. Therefore, a replication of the study might be advisable by including the above-stated suggestions.

There are many ways to further explore self-efficacy in collaboration which is of importance to guarantee successful working and learning. One may be to plan a study in which students work on a project for a longer period and investigate whether their self-efficacy levels, willingness to participate and collaboration experience change.

Implications

The performed research provides several useful insights. The conducted study showed a negative correlation between self-efficacy and general group work performance. This finding doubts the premise that increased self-efficacy necessarily leads to better outcomes, and also underlines the consequences of overconfidence in group work. Another implication is the relationship between self-efficacy, collaboration and participation might be inconclusive. This shows that there are numerous factors at play and a complicated connection between these variables. Moreover, this contradicts previous research and suggests that the investigated relationships might not be universally applicable. Hence, the significance of examining aspects other than self-efficacy, such as motivation might be of equal importance. Therefore, the need for more research and knowledge is emphasized in this area by identifying and explaining outcomes that were not definitive.

Practical implications that can be drawn from this research are that self-efficacy, collaboration experiences and participation in groups are complex and individual differences exist. Educators can notice these and adapt their teaching methods accordingly. This knowledge may assist instructors in creating more successful group work activities, providing appropriate

support and direction, and fostering a good and inclusive collaborative learning environment.

Conclusion

Based on this data, it can be concluded that the results of the study are rather contradictory to the findings of similar research. As a result, it is advised to investigate this in more detail in order to determine the causes of these discrepancies. This way further implications concerning self-efficacy and collaboration in project groups can be drawn. So, the collaborative learning experience can be enhanced, and students can be supported accordingly. Further investigations are of importance since they can affect the overall group performance, and for instance, supervisors can benefit from these implications. Regarding the individual effect of self-efficacy levels on collaboration, there are still many unresolved questions. The perspective on collaboration can change negatively when it is not supported. Future studies should focus on ways to make collaboration more pleasant and rewarding for all parties involved. Understanding how self-efficacy affects collaboration in project groups is essential for increasing collaborative learning and providing students with the assistance they need. By addressing these unresolved questions and trying to enhance collaboration educators, supervisors, and students can create positive and productive group interactions, which can ultimately lead to improved overall group performance and outcomes.

References

Alharbi, H., & Alshehry, A. S. (2019). Perceived stress and coping strategies among ICU nurses in government tertiary hospitals in Saudi Arabia: a cross-sectional study. *Annals of Saudi Medicine*, *39*(1), 48–55. https://doi.org/10.5144/0256-4947.2019.48

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*(2), 191–215. https://doi.org/10.1037/0033-295x.84.2.191

Bandura, A., Freeman, W. H., & Lightsey, R. (1999). Self-Efficacy: The Exercise of Control. *Journal of Cognitive Psychotherapy, 13*(2), 158–166. https://doi.org/10.1891/0889-8391.13.2.158

Bandura, A., Barbaranelli, C., Caprara, G. V., & Pastorelli, C. (1999). Self-efficacy beliefs as shapers of children's aspirations and career trajectories. *Child Development, 70*(3), 544-568. https://doi.org/10.1111/1467-8624.00038

Barkley, E. F., Cross, K. P., & Major, C. H. (2004). Collaborative Learning Techniques: A Handbook for College Faculty. https://ci.nii.ac.jp/ncid/BB16951603

Bedel, E. (2015). Exploring Academic Motivation, Academic Self-efficacy and Attitudes toward Teaching in Pre-service Early Childhood Education Teachers. *Journal of Education and Training Studies, 4*(1). https://doi.org/10.11114/jets.v4i1.561

Bonett, D. G., & Wright, T. W. (2014). Cronbach's alpha reliability: Interval estimation, hypothesis testing, and sample size planning. *Journal of Organizational Behavior, 36*(1), 3–15. https://doi.org/10.1002/job.1960

Carraher Wolverton, C., Molloy, M., & Lane, B. (2020). Fostering Collaborative Learning and Innovation in Higher Education: A Critical Review of Key Issues and Challenges. *Journal of Higher Education Policy and Management, 42*(6), 633-646. https://doi.org/10.1080/1360080X.2020.1802498

Christens, B. D., Speer, P. W., & Peterson, N. A. (2016). Assessing Community Participation: Comparing Self-Reported Participation Data with Organizational Attendance Records. *American Journal of Community Psychology*, *57*(3–4), 415–425. https://doi.org/10.1002/ajcp.12054

Cintina, I., & Potluri, R. M. (2021). The impact of small sample sizes on multilevel analysis of business-to-business data. *Industrial Marketing Management, 92*, 2-12. https://doi.org/10.1016/j.indmarman.2021.01.001

DeBourgh, G. A., & Towle, M. A. (2014). Collaboration and the online group: A comparison of asynchronous discussion boards, videoconferencing, and in-person groups. *Journal of Educational Technology Development and Exchange, 7*(1), 1-14.

Dehler, J., Bodemer, D., Buder, J., & Hesse, F. W. (2011). Guiding knowledge communication in CSCL via group knowledge awareness. *Computers in Human Behavior, 27*(3), 1068–1078. https://doi.org/10.1016/j. chb.2010.05.018

DeWitz, S. J., & Walsh, W. B. (2002). Self-efficacy and college student satisfaction. *Journal of Career Assessment, 10*(3), 315-327. https://doi.org/10.1177/106907270201000303

Fuchs, L. S., Fuchs, D., Karns, K., Hamlett, C. L., & Katzaroff, M. (1999). The importance of equal peer status to high-achieving students with disabilities. *Exceptional Children, 65*(4), 550-563. https://doi.org/10.1177/001440299906500405

Hammouri, H., & Abu-Shanab, E. (2018). The effect of self-efficacy and motivation on students' academic performance and satisfaction in MOOCs context. *Education and Information Technologies, 23*(5), 2009-2027. https://doi.org/10.1007/s10639-017-9656-3

Hogg, J. R., Han, J. E., & Kim, J. (2012). Self-efficacy and collaboration in multidisciplinary healthcare teams. *Journal of Advanced Nursing, 68*(4), 747–756. https://doi.org/10.1111/j.1365-2648.2011.05839.x

Huang, Y. M., Huang, Y. M., Huang, T. C., & Wu, T. T. (2014). Exploring learners' collaborative knowledge construction behaviors in an augmented reality simulation system. *Computers & Education, 77*, 13-22. https://doi.org/10.1016/j.compedu.2014.04.009

Husain, U. K. (2014). Relationship between Self-Efficacy and Academic Motivation. https://doi.org/10.15242/icehm.ed1214132

Jager, J., Putnick, D. L., & Bornstein, M. H. (2017). More than just convenience: the scientific merits of homogenous convenience samples. *Monographs of the Society for Research in Child Development, 82*(2), 13–30. https://doi.org/10.1111/mono.12296

Janssen, J., Erkens, G., Kirschner, P. A., & Kanselaar, G. (2009). Influence of group member familiarity on online collaborative learning. *Computers in Human Behavior, 25*(1), 161–170. https://doi.org/10.1016/j.chb.2008.08.010

Jo, I. H., & Dennen, V. P. (2017). Exploring participation styles in online group discussions: Patterns and relationship to self-efficacy. *Internet and Higher Education, 33*, 58-66. https://doi.org/10.1016/j.iheduc.2017.01.004

Joo, M.-H., & Dennen, V. P. (2017). Measuring University Students' Group Work Contribution: Scale Development and Validation. *Small Group Research, 48*(3), 288–310. https://doi.org/10.1177/1046496416685159

Ku, H., Tseng, H., & Akarasriworn, C. (2013). Collaboration factors, teamwork satisfaction, and student attitudes toward online collaborative learning. *Computers in Human Behavior, 29*(3), 922–929. https://doi.org/10.1016/j.chb.2012.12.019

Khong, J. Z. N., Liem, G. a. D., & Klassen, R. D. (2017). Task performance in small group settings: the role of group members' self-efficacy and collective efficacy and group's characteristics. *Educational Psychology, 37*(9), 1082–1105. https://doi.org/10.1080/01443410.2017.1342767

Kline, P. (2014). An Easy Guide to Factor Analysis. In Routledge eBooks. https://doi.org/10.4324/9781315788135

Lee, W., Lee, M., & Bong, M. (2014). Testing interest and self-efficacy as predictors of academic self-regulation and achievement. *Contemporary Educational Psychology, 39*(2), 86–99. https://doi.org/10.1016/j.cedpsych.2014.02.002

LePine, R. W., Piccolo, R. F., Jackson, C. L., Mathieu, J. E., & Saul, J. R. (2008). A meta-analysis of teamwork processes: Tests of a multidimensional model and relationships with team effectiveness criteria. *Personnel Psychology, 61*(2), 273–307. https://doi.org/10.1111/j.1464-0597.2008.00341.x

Mendolia, M., Walker, R. M., & Tsukuda, R. A. (2018). Examining the relationship between group efficacy and group performance: The importance of task interdependence and group

task characteristics. *Group Dynamics: Theory, Research, and Practice, 22*(4), 245-261. https://doi.org/10.1037/gdn0000088

Mierzejewska, B., & Radziszewska, B. (2014). *The influence of self-efficacy on student group work effectiveness. Educational Studies, 40*(4), 379-394. https://doi.org/10.1080/03055698.2014.895308

Mullen, S. P., Gothe, N. P., & McAuley, E. (2013). Evaluation of the factor structure of the Rosenberg Self-Esteem Scale in older adults. *Personality and Individual Differences, 54*(2), 153–157. https://doi.org/10.1016/j.paid.2012.08.009

Mumtaz, S. (2000). Factors affecting teachers' use of information and communications technology: a review of the literature. *Journal of Information Technology for Teacher Education, 9*(3), 319–342. https://doi.org/10.1080/14759390000200096

Mustafa, G., Glavee-Geo, R., Grønhaug, K., & AlMazrouei, H. (2019). Structural Impacts on Formation of Self-Efficacy and Its Performance Effects. *Sustainability, 11*(3), 860. https://doi.org/10.3390/su11030860

Paulhus, D. L. (2002). Socially desirable responding: The evolution of a construct. In H. I. Braun, D. N. Jackson, & D. E. Wiley (Eds.), The role of constructs in psychological and educational measurement (pp. 49-69). Lawrence Erlbaum Associates.

Pourhoseingholi, M. A., Baghestani, A. R., & Vahedi, M. (2012). How to control confounding effects by statistical analysis. *PubMed*. https://pubmed.ncbi.nlm.nih.gov/24834204

Roscoe, R. D., & Chi, M. T. (2007). Understanding tutor learning: Knowledge-building and

    knowledge-telling in peer tutors' explanations and questions. *Review of Educational*

    Research, 77(4), 534-574. https://doi.org/10.3102/0034654307309920

Schullery, N. M., & Schullery, S. E. (2016). Collaboration and diversity: Characteristics of

    successful group work. *Journal of Education and Training Studies, 4*(5), 56-64.

    https://doi.org/10.11114/jets.v4i5.1545

Schwarzer, R. (2012). The General Self-Efficacy Scale (GSE). *ResearchGate*.

    https://www.researchgate.net/publication/298348466_The_General_Self-

    Efficacy_Scale_GSE

Stark, E. M., & Bierly, P. E. (2009). An analysis of predictors of team satisfaction in product

    development teams with differing levels of virtualness. *R & D Management, 39*(5), 461–

    472. https://doi.org/10.1111/j.1467-9310.2009.00571.x

Stone, D. (1994). Overconfidence in Initial Self-Efficacy Judgments: Effects on Decision

    Processes and Performance. *Organizational Behavior and Human Decision Processes*,

    59(3), 452–474. https://doi.org/10.1006/obhd.1994.1069

Tripepi, G., Jager, K. J., Dekker, F. W., & Zoccali, C. (2010). Selection Bias and Information

    Bias in Clinical Research. *Nephron*, *115*(2), c94–c99. https://doi.org/10.1159/000312871

Vancouver, J. B., & Kendall, L. N. (2006). When self-efficacy negatively relates to motivation

    and performance in a learning context. *Journal of Applied Psychology, 91*(5), 1146–1153.

    https://doi.org/10.1037/0021-9010.91.5.1146

Vancouver, J. B., & Sawilowsky, S. S. (2000). Probability of best group membership as a function of task interdependence and familiarity. *The Journal of Social Psychology, 140*(2), 179-188. https://doi.org/10.1080/00224540009600481

Webb-Williams, J. (2021). Teachers' Use of Within-Class Ability Groups in the Primary Classroom: A Mixed Methods Study of Social Comparison. *Frontiers in Psychology, 12*. https://doi.org/10.3389/fpsyg.2021.728104

Wecker, C., & Fischer, F. (2014). Where is the evidence? A meta-analysis on the role of argumentation for the acquisition of domain-specific knowledge in computer-supported collaborative learning. *Computers & Education, 75*, 218–228. https://doi.org/10.1016/j.compedu.2014.02.016

Yang, J. C., & Wang, C. H. (2017). Understanding online knowledge sharing behaviors of students in a trust-based collaborative learning community: A social cognitive theory perspective. *Computers & Education, 106*, 1-14. https://doi.org/10.1016/j.compedu.2016.12.004

Yadav, P., Jena, L. K., Pattnaik, J., & Singh, A. K. (2021). Investigation of factors influencing project group collaboration: A PLS-SEM approach. *Technology in Society, 64*, 101476. https://doi.org/10.1016/j.techsoc.2020.101476

Zambrano, R. J., Kirschner, F., Sweller, J., & Kirschner, P. A. (2019). Effects of group experience and information distribution on collaborative learning. *Instructional Science, 47*(5), 531–550. https://doi.org/10.1007/s11251-019-09495-0

Appendix A

Questionnaire 1

Informed Consent

Hello, I am a student at the University of Twente who is currently undertaking her Bachelor. This data will be collected and analyzed for my thesis. This study aims to explore and investigate the effect of self-efficacy on collaboration experience and work distribution in project groups. To take part in this study you have to be a psychology student who is currently doing Module 7. Participating in this study can be beneficial in terms of learning about your own level of self-efficacy. If you agree to participate in this research, you will be asked to answer two short questionnaires which will take you approximately 20 minutes in total. The study consists of two short questionnaires, one of which needs to be filled in at the beginning and the other one at the end of the study within a 4-week timeframe. Your participation in this study is completely voluntary and you may withdraw from the study at any time. If you decide to withdraw from the study after completing the survey, please send me an email with your participation number (which you will receive at the beginning of the study) until ..., 2023. All data from this study will be kept from inappropriate disclosure and will be accessible only through the University of Twente and to the researcher and their supervisors until the … Your name will not be connected to your responses or results and data will be handled completely confidential. If you would like to receive information about the outcomes of this study (your personal level of self-efficacy or a summary of the results), please contact the researcher via email by the end of the academic semester. In case you have any questions or concerns, please feel free to contact me via email: n.meese@student.utwente.nl

- Continue

I confirm that I have read and understood the participant information in the information sheet. I have had the opportunity to consider the information, ask questions, and have had these answered satisfactorily. I understand that in order to take part in this study, I should be a psychology student currently doing Module 7. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason. I understand that my data is anonymous and will be stored on secure university servers and that it will only be used for research purposes. I consent to take part in this study.

- I consent, begin the study
- I do not consent, I do not wish to participate

Are you currently a member of module 7 in the psychology program?

- No
- Yes

Age

please select your age

Gender

Please select your gender

- Male
- Female
- Other
- Prefer not to say

Country

Where are you from

- The Netherlands
- Germany
- Other (please indicate)
- _____

Education

What is the highest education level that you have completed

- College/ A levels
- Undergraduate degree (BA/BSC/other)
- Graduate degree (MA/MSc/MPHIL/other)
- Doctorate degree

Participant Differences

Participant number

Please give yourself a number to identify yourself consisiting of the first and last letter of your first name and last name and the month you were born (e.g. Anna Smith born Feburary = aash02)

_____

Group number

How many people are in your M7 group including yourself?

- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9

Project group

What is the name of your project group (you can find it on canvas under groups)?

- Survey user needs and satisfaction
- To what extent does the ability to solve nonverbal and verbal syllogisms relate to fluid intelligence, visual/verbal working memory, and attention?
- Towards A Reputation System for Social Online Communities
- Response selection skill
- Measuring Social Discourse over Time
- Comparing driving performance under varying traffic complexity levels. A descriptive study, employing the new Self-test of driving performance
- Website Navigation Structures : Eliciting Mental Models Using Card Sorting
- Motion capture motor learning differences between younger and older adults
- Investigating the effectiveness of different talk moves for promoting productive dialogues
- Are you able to decide yourself when you pass your course? – Involving university students in the creation of assessment criteria for university courses
- What you see is what you get – The use of visual representations to support collaborative learning processes.
- Why do it alone when you can do it together? – University students' levels of socially-shared regulation in collaborative tasks
- Video based learning
- "I can see you, I can hear you!" The effects of online meetings on victims and offenders after crime
- Victim- offender mediation

- Forgot Your Password? Motivating the Adoption of a Password Manager
- Do emotions about an unfair distribution of a sustainable energy project depend on whether someone is to blame?
- Perceptions of Controlling or Coercive behaviour in intimate relationships
- Designing change
- Human-Robot Collaboration in a Virtual Maze
- Examining the public opinion on restorative justice
- In the judge's chair: would you refer to mediation?
- Cross-modal stopping in game-like environments with gaming controls
- The personality traits that define the behavior of a victim of a ransomware attack
- When words make the difference – the effect of crisis negotiation strategies
- Justification of transgressive behaviours in team sports: the role of moral disengagement
- Usage of the 'BeReal app' and relation with wellbeing and body positivity among young adults
- Sitting Behaviour and Well-Being in University Students
- Exploring effects of awe: a virtual reality study
- The impact of live stories on nurses' empathy for residents in elderly homes
- The validation of the Traumatic Grief Inventory Self Report (TGI-SR+) in mourning Ukrainians
- Self-efficacy and well-being among university students
- How do (mental) health professionals experience the role of technology in their job?
- Validation of a new meaning in life scale in the context of climate change
- Self-compassion among young professionals (18-30 years old)
- The psychology of behavior change technology
- New perspectives on the association between stress and psychopathology
- Examining Imposter Phenomenon in University Students
- The role of emotion regulation in affective recovery from daily-life stress
- The relationship between student housing/accommodation and wellbeing
- Haven't been to the dentist in a while…
- Conceptualization, design, and prototype validation of an online intervention for mental health affectation related to climate change
- Fighting guesswork in quizzes
- To what extent does the ability to solve nonverbal and verbal syllogisms relate to fluid intelligence, visual/verbal working memory, and attention? 2
- Towards A Reputation System for Social Online Communities 2

- Towards A Reputation System for Social Online Communities 3
- Towards A Reputation System for Social Online Communities 4
- Response selection skill 2
- Measuring Social Discourse over Time 2
- Measuring Social Discourse over Time 3
- Measuring Social Discourse over Time 4
- Website Navigation Structures : Eliciting Mental Models Using Card Sorting 2
- Motion capture motor learning differences between younger and older adults 2
- Video based learning 2
- Video based learning 3
- Human-Robot Collaboration in a Virtual Maze 2
- Justification of transgressive behaviours in team sports: the role of moral disengagement 2
- motivational influences on stopping an already initiatred action
- Other please indicate
- _____

Select your supervisor(s)

- Rob van der Lubbe
- Jule Landwehr & Simone Borsci
- Willem Verwey
- Johannes Steinrücke, Anna Machen, Karel Kroeze, Martin Schmettow (Measuring Social Discourse over Time)
- Erik Roelofs
- Marlise Westerhof
- Russel Chan
- Johannes Steinrücke (Survey user needs and satisfaction)
- Adelson de Araujo and Ton de Jong
- Alieke van Dijk and Loes Hogenkamp
- Henny Leemkuil
- Pantelis Papadopoulos
- Florian Bonesteffen
- Iris van Sintemaartensdijk
- Nicole Huijt
- Steven watson
- Esther Kox
- Bas Boing
- Max Friehs

- Jiska Jonas-Van Dijk
- Marleen Haandrikman
- Michalis Georgiou
- Jedidjah Schaaij
- Alejandro Dominguez
- Annemarie Braakman
- Gerko Schaap
- Lina Bareisyte
- Luisa Reiter
- Maria Luisa Rispa Hoyos
- Marijke Schotanus-Dijkstra
- Marlon Nieuwenhuis
- Martha Kreuzberg
- Roelof de Vries
- Mirjam Radstaak
- Nienke Peeters
- Rick Pinkster
- Selin Ayas
- Thomas Vaessen
- Yudit Namer

Meetings

Where do you meet with your project group?

- Online
- Offline/ in person
- Both

Familiarity

Were you familiar with any of your group members before the start of your project?

- No
- Yes please indicate with how many (e.g. 2)
- _____

General Self- Efficacy Scale (GSE) bandura

Q1

In my project group, I can always manage to solve difficult problems if I try hard enough

- Not at all true
- Hardly true
- Moderately true
- Exactly true

Q2

In my project group, if someone opposes me, I can find the means and ways to get what I want

- Not at all true
- Hardly true
- Moderately true
- Exactly true

Q3

In my project group, it is easy for me to stick to my aims and accomplish my goal

- Not at all true
- Hardly true
- Moderately true
- Exactly true

Q4

In my project group, I am confident that I could deal efficiently with unexpected events

- Not at all true
- Hardly true
- Moderately true
- Exactly true

Q5

In my project group, thanks to my resourcefulness, I know how to handle unforeseen situations

- Not at all true
- Hardly true
- Moderately true
- Exactly true

Q6

In my project group, I can solve most problems if I invest the necessary effort

- Not at all true
- Hardly true
- Moderately true
- Exactly true

Q7

In my project group I can remain calm when facing difficulties because I can rely on my coping abilities

- Not at all true
- Hardly true
- Moderately true
- Exactly true

Q8

In my project group when I am confronted with a problem, I can usually find several solutions

- Not at all true
- Hardly true
- Moderately true
- Exactly true

Q9

In my project group if I am in trouble, I can usually think of a solution

- Not at all true
- Hardly true
- Moderately true
- Exactly true

Q10

In my project group I can usually handle whatever comes my way

- Not at all true
- Hardly true
- Moderately true
- Exactly true

Questionnaire 2

Informed Consent

Hello, I am a student at the University of Twente who is currently undertaking her Bachelor. This data will be collected and analyzed for my thesis. This study aims to explore and investigate the effect of self-efficacy on collaboration experience and work distribution in project groups. To take part in this study you have to be a psychology student who is currently doing Module 7. Participating in this study can be beneficial in terms of learning about your own level of self-efficacy. If you agree to participate in this research, you will be asked to answer two short questionnaires which will take you approximately 20 minutes in total. The study consists of two short questionnaires, one of which needs to be filled in at the beginning and the other one at the end of the study within a 4-week timeframe. Your participation in this study is completely voluntary and you may withdraw from the study at any time. If you decide to withdraw from the study after completing the survey, please send me an email with your participation number (which you will receive at the beginning of the study) until ..., 2023. All data from this study will be kept from inappropriate disclosure and will be accessible only through the University of Twente and to the researcher and their supervisors until the … Your name will not be connected to your responses or results and data will be handled completely confidential. If you would like to receive information about the outcomes of this study (your personal level of self-efficacy or a summary of the results), please contact the researcher via email by the end of the academic semester. In case you have any questions or concerns, please feel free to contact me via email: n.meese@student.utwente.nl

- Continue

I confirm that I have read and understood the participant information in the information sheet. I have had the opportunity to consider the information, ask questions, and have had these answered satisfactorily. I understand that in order to take part in this study, I should be a psychology student currently doing Module 7. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason. I understand that my data is anonymous and will be

stored on secure university servers and that it will only be used for research purposes. I consent to take part in this study.

- I consent, begin the study
- I do not consent, I do not wish to participate

Have you filled out the first survey

- No
- Yes (skip to participant number)

Age

please select your age

Gender

Please select your gender

- Male
- Female
- Other
- Prefer not to say

Country

Where are you from

- The Netherlands
- Germany
- Other (please indicate)
- _____

Education

What is the highest education level that you have completed

- College/ A levels
- Undergraduate degree (BA/BSC/other)
- Graduate degree (MA/MSc/MPHIL/other)
- Doctorate degree

Group number

How many people are in your M7 group including yourself?

- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9

Project group

What is the name of your project group (you can find it on canvas under groups)?

- Survey user needs and satisfaction
- To what extent does the ability to solve nonverbal and verbal syllogisms relate to fluid intelligence, visual/verbal working memory, and attention?
- Towards A Reputation System for Social Online Communities
- Response selection skill
- Measuring Social Discourse over Time
- Comparing driving performance under varying traffic complexity levels. A descriptive study, employing the new Self-test of driving performance
- Website Navigation Structures : Eliciting Mental Models Using Card Sorting
- Motion capture motor learning differences between younger and older adults
- Investigating the effectiveness of different talk moves for promoting productive dialogues
- Are you able to decide yourself when you pass your course? – Involving university students in the creation of assessment criteria for university courses
- What you see is what you get – The use of visual representations to support collaborative learning processes.
- Why do it alone when you can do it together? – University students' levels of socially-shared regulation in collaborative tasks
- Video based learning
- "I can see you, I can hear you!" The effects of online meetings on victims and offenders after crime
- Victim- offender mediation
- Forgot Your Password? Motivating the Adoption of a Password Manager
- Do emotions about an unfair distribution of a sustainable energy project depend on whether someone is to blame?
- Perceptions of Controlling or Coercive behaviour in intimate relationships

- Designing change
- Human-Robot Collaboration in a Virtual Maze
- Examining the public opinion on restorative justice
- In the judge's chair: would you refer to mediation?
- Cross-modal stopping in game-like environments with gaming controls
- The personality traits that define the behavior of a victim of a ransomware attack
- When words make the difference – the effect of crisis negotiation strategies
- Justification of transgressive behaviours in team sports: the role of moral disengagement
- Usage of the 'BeReal app' and relation with wellbeing and body positivity among young adults
- Sitting Behaviour and Well-Being in University Students
- Exploring effects of awe: a virtual reality study
- The impact of live stories on nurses' empathy for residents in elderly homes
- The validation of the Traumatic Grief Inventory Self Report (TGI-SR+) in mourning Ukrainians
- Self-efficacy and well-being among university students
- How do (mental) health professionals experience the role of technology in their job?
- Validation of a new meaning in life scale in the context of climate change
- Self-compassion among young professionals (18-30 years old)
- The psychology of behavior change technology
- New perspectives on the association between stress and psychopathology
- Examining Imposter Phenomenon in University Students
- The role of emotion regulation in affective recovery from daily-life stress
- The relationship between student housing/accommodation and wellbeing
- Haven't been to the dentist in a while…
- Conceptualization, design, and prototype validation of an online intervention for mental health affectation related to climate change
- Fighting guesswork in quizzes
- To what extent does the ability to solve nonverbal and verbal syllogisms relate to fluid intelligence, visual/verbal working memory, and attention? 2
- Towards A Reputation System for Social Online Communities 2
- Towards A Reputation System for Social Online Communities 3
- Towards A Reputation System for Social Online Communities 4
- Response selection skill 2
- Measuring Social Discourse over Time 2

- Measuring Social Discourse over Time 3
- Measuring Social Discourse over Time 4
- Website Navigation Structures : Eliciting Mental Models Using Card Sorting 2
- Motion capture motor learning differences between younger and older adults 2
- Video based learning 2
- Video based learning 3
- Human-Robot Collaboration in a Virtual Maze 2
- Justification of transgressive behaviours in team sports: the role of moral disengagement 2
- motivational influences on stopping an already initiatred action
- Other please indicate
- _____

Select your supervisor(s)

- Rob van der Lubbe
- Jule Landwehr & Simone Borsci
- Willem Verwey
- Johannes Steinrücke, Anna Machen, Karel Kroeze, Martin Schmettow (Measuring Social Discourse over Time)
- Erik Roelofs
- Marlise Westerhof
- Russel Chan
- Johannes Steinrücke (Survey user needs and satisfaction)
- Adelson de Araujo and Ton de Jong
- Alieke van Dijk and Loes Hogenkamp
- Henny Leemkuil
- Pantelis Papadopoulos
- Florian Bonesteffen
- Iris van Sintemaartensdijk
- Nicole Huijt
- Steven watson
- Esther Kox
- Bas Boing
- Max Friehs
- Jiska Jonas-Van Dijk
- Marleen Haandrikman
- Michalis Georgiou
- Jedidjah Schaaij

- Alejandro Dominguez
- Annemarie Braakman
- Gerko Schaap
- Lina Bareisyte
- Luisa Reiter
- Maria Luisa Rispa Hoyos
- Marijke Schotanus-Dijkstra
- Marlon Nieuwenhuis
- Martha Kreuzberg
- Roelof de Vries
- Mirjam Radstaak
- Nienke Peeters
- Rick Pinkster
- Selin Ayas
- Thomas Vaessen
- Yudit Namer

Meetings

Where do you meet with your project group?

- Online
- Offline/ in person
- Both

Familiarity

Were you familiar with any of your group member before the start of your project?

- No
- Yes please indicate with how many (e.g. 2)
- _____

Participant Differences

Participant number

Please give yourself a number to identify yourself consisting of the first and last letter of your first name and last name and the month you were born (e.g. Anna Smith born February = aash02)

_____

Have any students of your project group dropped out/are not present at meetings anymore?

- No
- Yes (indicate how many)
- _____

General Self- Efficacy Scale (GSE) bandura

Q1

In my project group, I can always manage to solve difficult problems if I try hard enough

- Not at all true
- Hardly true
- Moderately true
- Exactly true

Q2

In my project group, if someone opposes me, I can find the means and ways to get what I want

- Not at all true
- Hardly true
- Moderately true
- Exactly true

Q3

In my project group, it is easy for me to stick to my aims and accomplish my goal

- Not at all true
- Hardly true
- Moderately true
- Exactly true

Q4

In my project group, I am confident that I could deal efficiently with unexpected events

- Not at all true
- Hardly true
- Moderately true
- Exactly true

Q5

In my project group, thanks to my resourcefulness, I know how to handle unforeseen situations

- Not at all true
- Hardly true
- Moderately true
- Exactly true

Q6

In my project group, I can solve most problems if I invest the necessary effort

- Not at all true
- Hardly true
- Moderately true
- Exactly true

Q7

In my project group I can remain calm when facing difficulties because I can rely on my coping abilities

- Not at all true
- Hardly true
- Moderately true
- Exactly true

Q8

In my project group when I am confronted with a problem, I can usually find several solutions

- Not at all true

- Hardly true
- Moderately true
- Exactly true

Q9

In my project group if I am in trouble, I can usually think of a solution

- Not at all true
- Hardly true
- Moderately true
- Exactly true

Q10

In my project group I can usually handle whatever comes my way

- Not at all true
- Hardly true
- Moderately true
- Exactly true

Teamwork satisfaction 5. Likert Scale Agreement

I like working in a collaborative group with my teammates.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

I like solving problems with my teammates in the group project.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

Interacting with the other members can increase my motivation to

learn.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

I have benefited from interacting with my teammates.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

I have benefited from my teammates' feedback.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

I enjoy the experience of collaborative learning with my teammates.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

Working with my team helps me produce better project quality than

working individually.

- Strongly disagree
- Disagree
- Neutral
- Agree

- Strongly agree

My team members are sharing knowledge during the teamwork

Processes

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

I gain collaboration skills from the teamwork processes.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

Group Work Contribution Scale

During my group work I,

Made the best use of my ability to accomplish a group project

Did my equal share of a group project

Was willing to undertake a task if I had the ability to perform the task

Actively got involved in group discussions

Actively expressed my opinion to achieve better group outcomes

Never missed the schedule group meetings

Was punctual for the scheduled meetings

Fulfilled allocated tasks

Helped teammates who are unable to fulfill their roles

Corrected teammates' mistakes

Provided constructive feedback on teammates work

Was willing to help others beyond my assigned tasks

5. Likert scale Frequency: Never, Rarely, sometimes, often, always

In the following question you are asked to rate your project group's overall performance.

Everyone worked to the best of their abilities

Everyone participated in group discussion

Everyone performed their required duties

 Everyone participated in group meetings

Everyone assisted each other

Everyone provided each other with helpful feedback

Likert scale Frequency: Never (no one in the group), Rarely, sometimes (half of the group), often, always (the whole group)