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International Group Heterogeneity and Students' Business Project Achievement

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In business higher education, group project work plays an essential role. The purpose of the present study is to explore the relationship between the group heterogeneity of students' business project groups and their academic achievements at both group and individual levels. The sample consists of 536 freshmen from an International Business School in a Dutch University. The research has revealed that students' academic performances are positively correlated with their achievement in group projects at both individual and group levels. However, the group ethnic heterogeneity is negatively related with students' project scores. The findings may enable education practitioners to gain more insights into students' project work and manage students' group work more effectively.

Keywords: Business group project, Ethnic heterogeneity, Multilevel analysis, Business education, Project learning

1. INTRODUCTION

In business education, group work is a key component of curriculum, aiming at improving students' collaborative skills as well as their application of theoretical knowledge (Aggarwal & O'Brien, 2008; Forrester & Tashchian, 2006; Gueldenzoph & May, 2002; Topping, 2005; Wagar & Carroll, 2012). Working together for a business project exposes students to real-world working situations and novel problems.

In European higher education, group project work plays an essential role because students are required to be able to work in groups or teams in their future career beyond university.

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In line with the increasingly diverse workforce in Europe, student groups are becoming more and more heterogeneous regarding group members' ethnic backgrounds. In the past decade, most Dutch universities have set up international programs in business education. According to The Netherlands Universities Foundation for International Cooperation (Nuffic, 2012), which is the Dutch organization for international cooperation in higher education, there were approximately 26,050 German students enrolled in Dutch universities, in the academic year 2011–2012. The second largest non-Dutch group is composed of Chinese students, around 5700, occupying over 22% of the total students number (Ministry of Education, Culture and Science, 2012, p. 150). Business and economics studies have attracted the most non-Dutch students (Nuffic, 2012).

In the university classrooms, groups that span ethnic boundaries have become prevalent nowadays (Ding and Lin, 2012). However, past research on work group diversity indicates that there is no consistent and positive relationship between group heterogeneity and project achievement (Webber & Donahue, 2001; Williams & O'Reilly, 1998). Besides, very little research has been conducted in European higher education, exploring the relationship between students' achievement in group project and their ethnic backgrounds. An insight into the group ethnic heterogeneity may largely facilitate the understanding of education practitioners of business project work in European higher education. The purpose of the present study is to employ multilevel analyses to look into the relationship between students' ethnic backgrounds and their achievements in business projects at both group and individual levels, with the effect of group size at group level.

In this research article, we start with a literature review with regard to ability grouping, group size, and group ethnic composition. Based on the previous findings, we construct our research model and formulate hypotheses. After that, a description of the research methodology such as sample, data collection, and data analyses are given. Subsequently, the results of multilevel analyses are presented in order to answer the research questions. In the conclusion and discussion part, a reflection on the findings as well as practical implications will be given. Finally, the limitation of this study and the plan for future research are discussed.

2. THEORETICAL FRAMEWORK

As Gammie and Matson (2007) state, group work in business education provides an opportunity so that students can employ their management skills such as leadership and teamwork, develop critical thinking (Aggarwal & O'Brien, 2008), and communication skills with students from different cultures (Wagar & Carroll, 2012). In this case, the group is the learning unit (Suthers, 2006), and can be viewed as a learning unit made up of interdependent learners (Dillenbourg, Baker, Blaye, & O'Malley, 1996). Students need to work cooperatively to achieve a group output which is more demanding than their individual assignment. Group project learning is a coordinated and synchronous activity within which students try to carry out a task through reflection, negotiation, correction, and shared meaning making (Roschelle & Teasley, 1995; van Boxtel, 2000; Webb & Farivar, 1999). According to Salas, Cooke, and Rosen (2008), group work is a multilevel process, and within this process individual performances are interdependent. Thus, group project work involves individual work, and will not reduce it (Stahl, Koschmann, & Suthers, 2006).

However, these findings on the group work within higher educational settings are not universally supported (Rafferty, 2013). Even when working on the same task, the group and the

individual's achievement may vary extensively across groups or within a group (Arvaja & Hämäläinen, 2005). In the survey research of Payne, Monk-Turner, Smith, and Sumter (2006), 143 university students participate in a semester-long group project. Nevertheless, although the majority of the students report that the group project is beneficial for their future career, 40% of them complain that their group members contribute too little or even nothing. One-third of the students have no intention to join group work in the future classes.

In our previous research (Ding and Lin, 2012), we've found that Asian students received significantly lower scores than both Western and Eastern European students in group project work although they said that they enjoyed group work equally as their European counterparts.

2.1. Research Question 1: Are Group Members' Subject Performances Related with Their Achievements in a Business Group Project?

Some researchers argue that membership heterogeneity in terms of students' learning performances may positively influence the performance of group members, especially when a wide range of competencies are required to fulfill a task (Hackman, 1987; Pearce & Ravlin, 1987). Increasing the overall knowledge of the group is assumed to lead to a higher group performance (Pelled, Eisenhardt, & Xin, 1999). Kulik and Kulik (1989) find that students grouped on the basis of their academic ability slightly outperform students in heterogeneous groups. Webb, Nemer, Chizhik, and Sugrue (1998) investigated middle-school students' understanding of voltage in five schools. They claim that group ability composition has a significant impact on group work achievement. Groups consisting of high-achieving students perform better than groups with low or low-medium ability students. However, it is worthy to note that working with low-achieving students will not negatively influence high-achieving students.

Ability grouping is nearly impossible to implement in Dutch higher education. First of all, within-class homogenous grouping was strongly criticized in the past two or three decades (Hong, Corter, Hong, & Pelletier, 2012). Grouping students according to their academic achievement runs the risk of benefiting high-achieving students at the expense of the low-achieving classmates and a wider achievement gap (Trimble & Sinclair, 1987; Welner & Oakes, 1996; Zirkel & Gluckman, 1995). One requirement of public education in The Netherlands is to guarantee the education equality. Secondly, for the freshmen in the international business education, their intake scores are mainly their entry score at standardized English tests such as IELTS and TOEFL, as well as their high school certificates. Due to the various levels of high school education, it is impossible to standardize students' academic ability at their beginning stage of university education. Thirdly, one of the ultimate goals of international business education is to enable students to cope with group members at diverse ability levels in their future career. In most international business projects at workplace, it is required to collaborate with team members with various levels of abilities. All in all, heterogeneous group regarding students' academic ability is the main stream of international business education.

Based on the findings of previous studies concerning the effect of ability grouping on students' project achievement, we formulate directional hypotheses at both the group and individual levels.

H_{1a}: Group ability composition is positively related with students' achievement in business group projects.

H_{1b}: Students' individual ability is positively related with their achievement in business group projects.

2.2. Research Question 2: Is Group Size Related with Students' Achievements in Business Group Projects?

There is no consensus made by the previous researchers regarding the optimal group size. The best size for the group depends on the nature of the students as well as the nature of the task. Some research addresses that large groups often perform better than small counterparts because the former possess more expertise and can contribute more time to group work (e.g., Dennis & Valacich, 1993; Halebian & Finkelstein, 1993). Larger groups have more potential for innovation (Bantel & Jackson, 1989).

Yet, in general, the larger the learning group size, the more resources needed for the group success (Johnson & Johnson, 2006). Some studies reveal quite contradictory findings. For instance, O'Dell (1968) claims that large groups tend to have more conflicts. Lundgren and Bogart (1974) find that the larger group size, the lower level of cohesion and engagement. Brewer and Kramer (1986) also point out that there is less cooperation in large groups in comparison with that in small groups. However, the distinction between large and small group size is blurry. In the research conducted by Kivlighan, London, and Miles (2012), they compare group climate and group member satisfaction between 13 singly led and 19 co-led therapy groups ranging from three to 12 members. They claim that increasing group size results in more group conflicts, and it is related to a decrease of members' engagement level.

Some researchers argue that groups of two or three students may be better for novices and might be more suitable for shorter tasks. Groups of two or three may be better for less experienced students and shorter tasks, whereas groups of four to six may be appropriate for more experienced students and longer, larger tasks (Davies, 1993). A further advantage of small groups is that this reduces the chance of freeloading and conflict between group members.

As for the relationship between the group size and students' business project achievement, there is no consensus made by the previous researchers. It always relies on the nature of the tasks as well as the participants. Thus, we formulate our hypothesis regarding the effect of group size on students' project achievement as follows:

H₂: Group size is related with students' achievement in business group projects.

2.3. Research Question 3: Are Students' Ethnicity Backgrounds Related with Their Achievements in Business Group Projects?

As Butler and Zander (2008) pointed out, highly heterogeneous groups in ethnic backgrounds may boost a great potential of innovation. However, working in a group with members from diverse ethical backgrounds can be a tough job (Ely & Thomas, 2001). In the previous research, diversity of members' ethnical backgrounds is found to be negatively correlated with group performances. For instance, Tsui et al. (1992) found that increasing work-unit diversity has a more profound negative effect for white males than for ethnic minorities. Dissimilarity of the group's ethnicities has also been pointed out to lower the individual assessment of performance (Jackson,

1992). According to Maznevski and Chudoba (2000), teams that are culturally diverse are not always productive, and cannot live up to their expected potential of performance. Paul, Samarah, Seetharaman, and Mykty (2005) also examine the demographic diversity of group composition. It has been revealed that the greater diversity a group tends to have, the more collaborative conflict the group may have; in contrast, the more in-depth discussions before decision-making might occur in order to clarify diverse contributing perspectives. Riordan and Shore (1997) find out that smaller demographic distances among group members may trigger a higher level commitment and more group cohesion. Many conflicts arising in international group work have the roots in members' cultural diversity (Adair, Hideg, & Spence, 2013). The ethnic homogenous groups tend to be more cohesive than heterogeneous groups (Barsade & Gibson, 1998; Williams & O'Reilly, 1998). In Wiersema and Bantel's (1992) research, group ethnic homogeneity has been found to result in greater group productivity. In Pelled's (1996) study, demographic dissimilarity is found to be positively correlated with perceived emotional conflicts within groups, and perceptions of these emotional conflicts are negatively associated with the assessment of group productivity. They have also found that people from the same ethnic background tend to work together. Possible reasons are that ethnic similarity results in easier communication (March & Simon, 1958) and more trust (Lincoln & Miller, 1979) as well as more predictability (Hinds, Carley, Krackhardt & Wholey, 2000).

Wong (2004) claims that Asian students prefer individual work instead of working in a group because they want to have the control of the final product and be able to manage their own time. Asian students tend to be silent in group discussion due to some reasons, for example, their culture which stresses more on face-saving and humbleness, their inadequate language skills, their perceptions of the relevance of group work to learning (Tiong & Yong, 2004), and their anxiety to assessment (Tani, 2005).

Cohen (1982) finds that White students tend to be more active and talkative than minority students in North America. Sarker (2005) investigates student groups consisting of American and Thai students, and finds that students' ethnicity background significantly influences the knowledge transfer within the group. For instance, students from the individualistic culture tend to transfer more knowledge than those who come from the collectivist culture. In the research of O'Reilly, Phillips, and Barsade (1998), Whites reflect that more teamwork in groups is dominated by ethnic minorities, especially Asians.

However, empirical research hasn't demonstrated that the increased level of group ethnic diversity results in a decrease of group performance (Jehn, Chadwick, & Thatcher, 1997). Ethnic heterogeneity may improve the quality of creative brainstorming (O'Reilly et al., 1998; Williams & O'Reilly, 1998) and enhance the group efficacy (Sargent & Sue-Chan, 2001). Chudoba, Wynn, Lu, and Watson-Manheim (2005) find that although team members come from different culture backgrounds, they can perform very effectively.

In West European countries, ethnic grouping has a different picture as that in North America. According to Nuffic (2012), there is an increasing number of East European and Asian students in The Netherlands since a decade ago. Our hypotheses regarding the relationship between students' business project performances and their ethnic backgrounds are formulated as below.

H_{3a}: Group ethnic composition is related with students' achievement in business group projects.

H_{3b}: Students' individual ethnic background is related with their achievement in business group projects.

FIGURE 1 Conceptual Model for the Research.

Figure 1 demonstrates the conceptual model for the current research. Research on group project work has been criticized for ignoring the learning context in which individual students are embedded (Crook, 2000). According to Arvaja, Salovaara, Häkkinen, Järvelä (2007), the multilevel analyses facilitate the exploration of the influence of group context on students' group project activities. In the past decade, there has been a growing acknowledgment of using multilevel analyses to unravel the complexity of demographic constructs in working groups (Joshi, Liao, & Roh, 2011). The current two-level methodology is designed to combine the effect of variables at both individual and group levels on students' achievement in a business group project.

3. METHODOLOGY

3.1. Sample

The current study employed a sample of 1st year students at an International Business School (IBS) in a Dutch University of Applied Sciences. We have collected 609 1st year students' project scores from the school system from the academic year of 2010–2011 and 2011–2012. Besides, we also collected students' individual scores on related subject exams. However, due to the fact that some students leave the school after the 1st year, their individual scores on subject exams cannot be found in the school system. Lacking the data of one group member means that we have to remove the whole group from the research database. The final sample consisted of 536 students in total. Among them, there are 228 (42.5%) female students and 308 (57.5%) male students. Two hundred ninety-two (54.5%) students are local Dutch students, 103 (19.2%) are German students, 42 (7.8%) are Chinese students, and 78 (14.6%) are East-European students. Twenty-one (3.9%) students come from countries such as Spain, France, Mongolia, Vietnam, and Brazil. In this research, they are coded as "others" in categories regarding ethnicity. The sample nicely represents the ethnic composition of the population. In total, there are 127 groups. Among them, 31 are three-member groups, 46 are four-member groups, 41 are five-member groups, and nine are six-member groups.

3.2. Group Tasks

In business higher education, project-based learning has been widely taken as an effective methodology to improve students' experiences of real-world business operations (Danford,

2006). In the 1st year of the bachelor's program, students are required to accomplish two business projects through group work. One is called the Business Plan Project (BPP), and the other is the Consultancy Case Project (CCP). For both projects, at the beginning of the semester students are randomly assigned into groups with more than three and fewer than six members. But in order to improve students' intercultural communication and working skills, their ethnic backgrounds are intentionally mingled. Therefore, there are very few real homogeneous groups regarding students' ethnic backgrounds.

Students are required to complete their project work in the coming 10 weeks. Each group project work consists of two study blocks, and each block lasts 5 weeks. It is evident that during the 10-week group work, different opinions and conflicts may continuously emerge and all active group members may confront with a clash of viewpoints.

BPP is a virtual business preparation project. In the BPP, students are asked to develop their innovative ideas and set up a virtual business that should be profitable and feasible in reality. This project is connected with four subjects given in lectures during the semester, which are Behavioral Management Organization (BMO), Management Accounting (MAC), Law (LAW) and Marketing (MKT). The lectures are given parallel to the group project. At the end of the study periods, students need to attend the written exams of these subjects individually.

As for CCP, all groups receive the same case that reflects the real managerial decisions of a virtual company. Students need to study the case meticulously, analyze the macroeconomic and microeconomic situations and financial problems of the company, and write a report with the aim to help the company get financial support from a bank. This project is connected with three subjects given in parallel lectures during the semester, which are Economics (ECN), Financial Accounting (FAC) and Statistics (STA). The same as the other subjects, students need to attend the written exams individually at the end of the semester. The exam questions are closely related to what students have applied in their group project work.

3.3. Data Collection

In the 10th week, students need to finalize their group report and prepare several copies for submission. The subject teachers will evaluate each part of the group report and score it. There is one group score concerning the overall quality of the report. In the 12th week, students are required to give an oral presentation and defend for their group project. According to the school rules, students will give the presentation in groups but each student needs contribute equally to the presentation. In order to test individual students' knowledge of the group project, for each group, after the presentation the whole group needs to sit in front of the panel of subject teachers, answering the subject-related questions. Questions are asked toward each individual student, but in the case that one student cannot answer the question, his/her group members can volunteer to answer the question. Based on students' individual performance in the oral defense, they may receive or lose some points. For those who are not able to answer some or any questions, their scores will be reduced. The range for score variation is from -1 to $+1$ point. Therefore, each student receives an individual score from their group project work, but the scores hinge around their group scores. As the survey research of Wagar and Carroll (2012) indicates, students do not advocate the same grade for all group members, regardless of effort. One of their major concerns is the uneven distribution of the workload among group members during the group work process.

Besides students’ scores in BPP and CCP, we also collect students’ individual scores in the related subjects and calculate the averages. For example, for students who participated in the BPP, the parallel subjects are MAC, LAW, BMO and MKT. Within each group, we calculate the average score for these four subjects for each group member. For students who accomplish CCP, we compute the average score for subjects such as ECN, FAC and STA. Students’ individual scores in these parallel subjects are used as an explanatory variable to explore the relationship between group demographic compositions, students’ assessment, and the group performances. Table 1 shows students’ group scores as well as their average subject scores in exams. It is worth mentioning that in the Dutch school system, 10 represents the full points of the exam while 5.5 is the passing grade.

3.4. Data Analyses

In order to explore whether the group ethnic heterogeneity influences the members’ project achievements, within each group we compare each member’s ethnic background with that of all the other members, and sum up the values. Then, we divide the sum by the total of comparisons for each group. For instance, in a four-member group with one Dutch student, two German students, and one Chinese student, the ethnic differences between the Dutch student with other three members are 1, 1, 1, respectively. So, the Dutch student is assigned with “1,” derived from $(1 + 1 + 1)/3 = 1$, and the Chinese student gets the same value, “1.” The ethnic differences between one German student and other group members are 1, 0, 1, respectively. This means that the German student is assigned a value “0.6667,” from $(1 + 0 + 1)/3 = 0.6667$.

TABLE 1
Students’ Project Scores and Individual Subject Scores Across Demographic Factors at Individual and Group Levels

<i>Variable</i>	<i>Number</i>	<i>Mean (Standard Deviation) of Students’ Project Scores</i>	<i>Mean (Standard Deviation) of Students’ Subject Scores</i>
Demographic factors at individual level			
Individual gender (%)			
Female	228	6.78 (0.79)	6.35 (1.26)
Male	308	6.68 (0.79)	6.18 (1.36)
Individual ethnicity (%)			
Dutch	292	6.73 (0.77)	6.08 (1.37)
German	103	6.89 (0.85)	6.72 (1.16)
Chinese	42	6.57 (0.82)	6.07 (1.32)
East European	78	6.58 (0.71)	6.34 (1.25)
Others	21	6.62 (0.94)	6.25 (1.04)
Factors at group level			
Group size (%)			
3-member groups	93	6.57 (0.81)	6.18 (1.19)
4-member groups	184	6.76 (0.80)	6.16 (1.30)
5-member groups	205	6.72 (0.80)	6.23 (1.39)
6-member groups	54	6.88 (0.09)	6.73 (1.24)
Total:	536 (100%)	6.72 (0.79)	6.25 (1.32)

The group ethnic heterogeneity is based on the mean of all members' ethnic differences within the group. Thus, for the above example of four-member group, the group ethnic heterogeneity value is 0.8334, derived from $(1 + 0.6667 + 0.6667 + 1)/4 = 0.8334$.

4. RESULTS

Our central interest in this study is to assess the effect of students' ability and ethnic background at two levels. At the individual level, we explore the influences of students' ethnicity as well as their individual performances on subject exams which are related to the group projects, while at the group level we focus on the group composition regarding students' subject performances and ethnic backgrounds.

According to Paletz, Peng, Erez, and Maslach (2004), it is inaccurate to apply normal regression methods to analyze the multilevel data. In our research, the dependent variable is students' final project scores. Although students received their final project scores individually, these scores largely depended on in which group the student was assigned. As discussed before, the project score was based on an evaluation on the group report and presentation. All group members received one score, but based on their performance and knowledge during the oral defense, their individual scores were attuned to vary from -1 to $+1$ around the group project score. For the predictor variables in this study, the group ability and ethnic compositions are at the group level of analysis, as well as the group size, whereas students' gender and their subject performances are at the individual level. Given the hierarchical structure of the data, we conducted a multilevel analysis that is more suitable to look into the nested structure of our research data (Ding, Bosker, & Harskamp, 2010). Table 2 presents the results of the multilevel analyses with estimation for individual students' group scores.

We first established an empty model (Model 0) without entering predictor variables in order to explore some basic information about the dependent variable, students' project scores (Snijders & Bosker, 1999). Based on this, we get information on the variance between groups ($\sigma^2_{\mu 0}$) and the variance between individuals within a given group (σ^2_e). We calculated the intraclass correlation (ICC) of students' project group scores using the following equation:

$$ICC = \frac{\sigma^2_{\mu 0}}{\sigma^2_{\mu 0} + \sigma^2_e}.$$

Model 0 shows $\sigma^2_{\mu 0} = 0.544$, $\sigma^2_e = 0.088$, so $ICC = 0.8608$. This indicated that 86.08% of the variance in students' scores was attributed to group-level predictors and the remaining variation, 13.92%, was at the individual level. This finding is in line with the evaluation method of students' group project in the school. As aforementioned, for each group project, students receive a group score after their oral defense. Based on this group score, they may get bonus points ranging from $+1$ to -1 point. Therefore, students' final project scores largely hinge around their group project scores. Following are the results for the test of our hypotheses.

4.1. Research Question 1: Are Students' Subject Scores Related to Their Group Scores?

In order to answer the research questions, we first add students' individual scores and the group mean of their individual scores as explanatory variables into the model step by step. In Model 1

TABLE 2
Summary of the Model Estimates for Two-Level Analyses of Students' Group Performances Using Demographic Factors

<i>Fixed Effect</i>	<i>Model 0</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>
Intercept	6.709 (0.067)	6.710 (0.066)	6.714 (0.064)	6.715 (0.064)	6.594 (0.130)	6.573 (0.130)	6.542 (0.127)
Individual subject scores in written exams	0.048 (0.011)*	0.044 (0.011)*	0.044 (0.011)*	0.044 (0.011)*	0.040 (0.011)*	0.040 (0.011)*	0.040 (0.011)*
Average of members' subject scores in written exams within the group			0.282 (0.096)*	0.288 (0.097)*	0.287 (0.099)*	0.288 (0.099)*	0.252 (0.096)*
Dispersion of members' subject scores in written exams within the group				0.036 (0.115)	0.029 (0.114)	0.027 (0.114)	0.003 (0.111)
Group size (3-member vs. 4-member group as reference)					0.190 (0.167)	0.200 (0.167)	0.206 (0.162)
vs. 5-member groups					0.132 (0.171)	0.143 (0.171)	0.194 (0.167)
vs. 6-member groups					0.128 (0.276)	0.139 (0.275)	0.203 (0.268)
Ethnic background (Dutch as reference)						0.089 (0.039)*	0.094 (0.039)*
vs. German						0.026 (0.056)	0.033 (0.056)
vs. Chinese						-0.062 (0.041)	-0.056 (0.041)
vs. East European						0.052 (0.075)	0.062 (0.075)
vs. Others						-0.604 (0.213)*	-0.604 (0.213)*
Group ethnic heterogeneity							
Variance							
Group level							
Individual level	0.544 (0.071)	0.531 (0.069)	0.496 (0.065)	0.495 (0.065)	0.490 (0.064)	0.489 (0.064)	0.459 (0.060)
Deviance (-2 log likelihood)	0.088 (0.006)	0.085 (0.006)	0.085 (0.006)	0.085 (0.006)	0.085 (0.006)	0.083 (0.006)	0.083 (0.006)
Decrease	635.504	617.184	608.729	608.630	607.327	597.315	589.513
	18.320*		8.455*	0.099	1.402	10.012*	7.802*

* $p < .05$.

(see Table 2), students' individual scores on related subject exams are entered as an explanatory variable. We've found that students' individual performances in subject exams has a significant effect on their group performances, $\chi^2(1, N = 536) = 18.32, p < .05$. But there is a quite weak positive correlation. An increase of 1 unit on the subject exam score increases students' group project scores by 0.05 point.

In Model 2, we add the group average of members' subject scores in written exams as an explanatory variable. As shown in Table 2, it is significantly related with students' achievement in the group project,

$\chi^2(1, N = 536) = 8.455, p < .05$. In comparison with individual students' subject scores, the group average of subjects has a bit stronger relationship with their group project achievement. An increase of 1 unit of the whole group average on subjects will lead to an increase of 0.28 point of members' group project scores.

We are also interested in whether the dispersion of members' subject achievement is related to their group project achievement. To quantify the dispersion of students' subject scores within the group, we used the standard deviation of group members' subject scores within each group. The variable is introduced into Model 3 and it has been found that the dispersion of students' subject achievement has no effect on their group project achievement, $\chi^2(1, N = 536) = 0.099, p > .05$.

4.2. Research Question 2: Is There an Effect of Group Size on Group Project Performance?

Our second research question concerns the group size. In total, there are 31 (24.41%) three-member groups, 46 (36.22%) four-member groups, 41 (32.28%) five-member groups, and nine (7.09%) six-member groups. In Model 4, we add the group size as an explanatory variable at the group level with the three-member group as a reference group; see Table 2. It shows that students in the four-, five-, and six-member groups score equally well as those in the three-member groups. There is no significant effect of group size regarding students' group project work, $\chi^2(3, N = 536) = 18.32, p > .05$.

4.3. Research Question 3: Is There an Effect of Students' Ethnic Background on Their Group Project Performances?

With regard to the effect of students' ethnic background on their group project performances, we first look at whether students' individual ethnic background influences their group project achievement. In Model 5, the variable of students' ethnic background is introduced with Dutch students as the reference category; see Table 2. It is found that there is a significant effect in this regard, $\chi^2(2, N = 536) = 10.012, p < .05$. German students significantly scored higher than Dutch students in the group projects, $t(393) = 2.282, p < .05$, while there is no significant difference between Dutch and Chinese as well as East European students regarding their project scores. Furthermore, we conducted a pairwise comparison between German with East European students as well as Chinese students. It is found that German students score significantly higher than East European students, $t(179) = 3.082, p < .05$; but German students do not score significantly higher than Chinese students, $t(143) = 1.033, p < .05$.

In Model 6, at the group level we use the group ethnic heterogeneity as the new explanatory variable. From Table 2, it is worth noting that this variable is negatively correlated with students' group project achievement, and the reduction of deviance is significant, $\chi^2(1, N = 536) = 7.802$, $p < .05$.

5. CONCLUSION AND DISCUSSION

Nowadays, group project work has been widely applied and becomes a part of the business curriculum with the aim to improve students' team skills and cooperative learning (Amato & Amato, 2005). Within limited study time, homogenous groups regarding students' academic performances or ethnic background may show much less conflicts in comparison with heterogeneous groups. However, this approach is not in line with the increasingly internationalized working place (Kelly, 2009). Because the global economy requires that organizations deal with a more and more diverse customer base, a workforce characterized by demographic heterogeneity becomes prevalent in organizations. According to Wright and Drewery (2006), diverse and distributed teams are becoming the norm for businesses and governments around the world. Such business group projects are assumed to facilitate students' knowledge and skills that are necessary in a real business world (Pang, Tong, & Wong, 2011). To date, far less attention has been paid to group work research in European higher education, especially regarding students' ethnic backgrounds.

Our research has identified three factors that may influence students' performances in business group projects. First, we look into students' subject achievements. At the group level, it is found that the higher the average of group members' subject scores, the higher their achievement in business group project. It is self-evident and is quite in line with the previous findings by Pelled et al. (1999). Groups consisting of high-achieving students outperform those of low-achieving students.

At the individual level, we've also found that students' subject score is a significant predictor for their group project scores; however, the effect size is quite small. This finding consolidates the claim that group project work involves and will not reduce the individual learning (Stahl et al., 2006), but the group project is predominantly a synthetic of individual knowledge, effort, and contribution. Robbins and Judge (2011) claim that a project team produces positive synergy through members' coordinated effort. Now, the question arises for education practitioners: Shall we group students according to their abilities? In 2009, Marks and O'Connor (2013) conducted a large-scale questionnaire survey in Longwood University in the United States. According to their study, students generally understand that working in groups is an important skill valued by future employers. However, they are not in favor of grouping by abilities. There is no correlation between students' academic performance and their interest in grouping by abilities. What is unexpected, however, high-achieving students do not prefer homogeneous groupings by ability.

As for the effect of group size, there is no significant relationship between the group size and students' achievement in the group project. Although in the past we have received quite a lot of complaints from students in three- or four-member groups, it is found that they can achieve equally well as those in five- or six-member groups. Yet, it is worth noting that past research indicates that the effect of group size on group productivity may be curvilinear (Steiner, 1972; Nieva, Fleishman, & Reick, 1985), which means that a too small or too large group size may influence the group effectiveness negatively. In the review study conducted by Cohen and Bailey

(1997), a U-shaped relationship was revealed between group size and group achievement. But it needs to be replicated in a future study and explore whether the relationship is moderated by different group types such as project teams in this case.

Higher education in West Europe has been increasingly characterized by multicultural styles and ethnic heterogeneity. Classrooms on the European campus have gained new facets concerning the diverse ethnic backgrounds of students. In our research, we distinguish factors regarding students' ethnic backgrounds at both the individual and group level. At the individual level, we've found that the Dutch students scored significantly lower than their German counterparts in business projects. Even though German and Dutch students come from two countries that are geographically close to each other, there is a significant difference between their students in business group projects. According to the experience of local teachers and the school managers, this finding is not surprising. One plausible explanation might be students' different learning motivation. For Dutch students who have enrolled in either the University of Applied Sciences (HBO) or the Research University (WO), they receive sufficient financial support from the Dutch government. Even if they fail to graduate, they are still able to receive financial support to change their major during undergraduate study. On the one hand, such support lessens students' financial load in the university; on the other hand, in Dutch universities it has also been criticized to "demotivate" students. Moreover, German students also show higher learning ambition. The local teachers reflect that most German students are not satisfied with barely passing a project. Some German students who have passed the project with a score lower than 7.0 argued whether they can re-take the project so that they can improve their grades. But such case happens seldom to Dutch or East European students.

In contrast to the evident ambition of German students, Chinese students are deemed as quiet and obedient followers in a business project group. The finding surprises local teachers a bit that there is no significant difference between German and Chinese students' scores in business group projects. According to the local teachers, one interesting thing to mention is that European group members frequently complained about Chinese students' silence or poor English writing. European students tend to think that Chinese students do not have sufficient knowledge to fulfill the task or they do not contribute to the group project to the full. Yet, the analyses have shown that Chinese students do not lag behind in the business projects.

Our research has also addressed a negative relationship between group ethnic heterogeneity and students' project performances. It indicates that, the more ethnic heterogeneous the project group is, the lower achievement group members may get. This finding is consistent with the claims of some researchers such as Maznevski et al. (2000). In the review study conducted by Mathieu, Maynard, Rapp, and Gilson (2008), cultures that have similar values on cooperation tend to facilitate group effectiveness. However, for many practitioners in business education, one of the propositions to form intercultural group work is, the more ethnic heterogeneous, the better students may learn from each other. This finding may challenge this assumption. Recalling the complaints concerning Chinese students' silence during group work, we may know the possible reasons. It is self-evident that group work relies on extensive communication between group members. With the increasing level of heterogeneity, fewer exchanges are expected among group members (Pelled et al., 1999). Being quiet or seldom saying "No" may not lead to a lower score in the group project, but it might result in a cutoff of communication. In the research of Myers (2009), students report that great conversational abilities are essential in group success, including comprehending what is said and how it is said.

Webber and Donahue (2001) claim that research findings on the effect of diversity on group performance are quite mixed. Jackson, Joshi, and Erhardt (2003) further point out that the influence of diversity is sensitive to the task and its societal and organizational context. In the article by Christoffersen (2011), she has also mentioned that some students complain that they shoulder all the work-load while the rest group members are free-riders. She suggested that students may take time to establish relationships before embarking on the group assignment. Divvying group tasks up at the beginning stage, some students may follow through while some may not. According to Harrison, Price, and Bell (1998), the effects of group demographic differences may dissipate over time. The initial demographic difference of students perceived by the group members becomes less influential over a period of time of group work (Watson, Kumar, & Michaelsen, 1993). Westphal and Milton (2000) point out that prior experiences or communication among group members may generally lessen the effect of group ethnic heterogeneity.

Based on our findings, we arrive at the following suggestions for teachers in business education to organize group projects:

1. Groups consisting of low-achieving students need to receive extra attention because they may score lower than groups of high-achieving students.
2. If groups consist of three up to six members, they are expected to perform equally well.
3. Groups consisting of members from diverse ethnic backgrounds need to be paid extra attention. It is recommendable to provide help to facilitate members' inner group communication.
4. Dutch students need to receive extra help concerning their group project, while Chinese students need to receive support regarding their communication style.

6. LIMITATIONS

We conducted this study in an international business school of an Applied Sciences University in The Netherlands because graduates are required to apply what they have learned from a business group project directly into practice. Although each group has been assigned a teacher as coach to guide the working process, the student group work skills are not completely visible to the teacher and can hardly be reflected from their meeting minutes or group process reports. In the coming study, we will look into the within-group communication by nonparticipant observations. Comparison of communication styles between groups may lead us to a more comprehensive framework of understanding students' business group project.

Regarding the East European students, we suggest a more fine-grained analysis in the future. In the current study, we took students from Poland, Ukraine, Estonia, Hungary, Czech Republic, Slovenia, and Russia as a unit. Apparently, students' prior knowledge and learning styles may differ largely among these countries.

Echoing the claims of researcher such as Westphal and Milton (2000), we are also interested in initiating a longitudinal research examining the dissipating effect of students' ethnic backgrounds. We may track students' group project performances throughout their 4-year undergraduate study.

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