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Student Attitudes Towards Change From Ability Grouping To Heterogeneous Grouping At A University Class*

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There is ample research on student grouping at primary, middle and high school level but it is a controversial issue for universities educating the high and low achievers in the same classes, reflecting confusion about whether scholarship and tuition fee students should be taught together. This study aims to shed light on what the student population at university thinks about heterogeneous grouping after seeing effects of ability grouping, about which there is almost no evidence. Students in an undergraduate department who started the academic year at two different sections grouped according to their prior achievement took courses in mixed ability classes the following semesters. They were given a questionnaire in three intervals asking them about their expectations and opinions of grouping before and after mixing and then after one year of study. 45 students responded to any two questionnaires and 15 responded to all three questionnaires. For the repeated measures design, Friedman test was carried out to see the change of ideas from time1 to time3 and Mann-Witney U test was used to see the differences in ideas between scholarship students and tuition-fee students. Mann-Whitney U test was carried out to test whether there was a difference in the GPAs of scholarship and tuition-fee students between time1 and time3. Students expressed a change in their attitudes about achievement and how the other group influenced them. GPAs of high ability students increased after they started being in educated in mixed ability class, realizing the fears of low achievers.

Introduction

The subject of heterogeneous/homogenous grouping has been an important issue for decades. In the first place, different terms have been used to describe the selection of students on the basis of ability, achievement or other criteria. Basically, ‘streaming’, ‘tracking’ and ‘setting’ have been used to express selection of students on the basis of achievement and frequently ‘ability grouping’ has come to be used more than ‘homogenous grouping’

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(Macqueen, 2013). Welke and Bragg (1958) indicate there were tracking practices in the United States around 1930s. While **s**ome (Pfeiffer, 1966) believed ability grouping was a myth, others said it produced especially clear effects (Kulik & Kulik, 1982). Many looked into ability grouping with equality in focus (Davies, Hallam & Ireson, 2003; Jackson, 2008). Therefore, ability grouping was not advised in order to avoid inequality among students. This is especially the case when preschool and primary education is considered. At the high school level evidence and feelings are varied (Keller, 2011). Some evidence showed benefit for the low achievers and no gain for the high achievers. Meta-analytic reviews show the effects of grouping programs depend on their features. Some grouping programs have little or no effect on students; other programs have moderate effects; and still other programs have large effects (Kulik, 1992). Even if there may be a need for a fresh look at the issue of grading in K-12, the issue has been well-documented. The debate still goes on but it needs to be evidenced at university level as well. Because of the different practices in student intake in higher education around the world**,** almost no study focused on student grouping in higher education.

Student grouping

There is controversy over the issue as grouping may be based on imperfectly measured ability, informal grouping, vague interpretation of terms, survey instruments that fail to discriminate ability and tracking, allocated resources, extent of grouping and the curriculum (Betts & Shkolnik, 2000).This study aims to shed light on what the student population thinks about heterogeneous grouping after living in an academically homogenous classroom environment at university.

Heterogeneous grouping

Slavin's review of 29 pieces of research on ability grouping on achievement found zero effect (Slavin, 1990) and his review of 27 researches on the effects of ability grouping on the achievement of middle school students found almost no difference between students grouped according to ability and heterogeneous grouping (Slavin, 1993). A study found that inequalities of civic competences across classrooms are relatively large in systems characterized by early selection on the basis of ability (Janmaat, 2011). Responding to growing concern over ability grouping, schools have introduced some alternative methods of delivering instruction, such as cooperative learning (which presumes heterogeneous learning groups) (Lee &Smith, 1993; Macqueen, 2013). In two studies, students in Gifted &Talented programs experienced systematic declines in three components of academic self-concept (Reading, Math, School) over time and in relation to matched comparison students in regular mixed ability classrooms, but not in four components of nonacademic self-concept (Physical, Appearance, Peer Relations, Parent Relations). In both studies, these results were consistent over gender, age, and initial ability level (Marsh, Chessor, Craven, & Roche, 1995**).** The achievements of average and less able students proved to be significantly higher when compared to their peers in the same ability classes, whereas highly able students performed about the same (Linchevski & Kutscher, 1998). Students most affected by inequities (ability grouping) are those achieving at the lowest levels (Macqueen, 2013). Heterogeneous grouping benefited the low achieving group most (Duru-Bellat, Mingat, 1998).

Ability grouping

Results revealed that the frequency with which teachers used ability groups was positively associated with mean school gain in reading, suggesting that early literacy and

reading improvement in kindergarten may be facilitated by the use of ability groups in reading (McCoach, O'Connell, & Levitt, 2006; Robinson, 2008).

There are also a lot of studies that support ability grouping especially for the high school period. On the one hand, findings by Slavin were criticized. Results of a study by Mulkey, Catsambis, Steelman & Crain (2005) reaffirm that tracking has persistent instructional benefits for all students. Yet, high-achieving students who are tracked in middle school may suffer considerable losses in self-concept that subsequently depress their achievement, and mathematics course-taking. Implications are for a broad range theory of tracking and for further empirical work on the viability of heterogeneously-grouped classes (Mulkey, Catsambis, Steelman & Crain, 2005). According to Jackson, being assigned to a school with higher-achieving peers has large positive effects on examination performance (Jackson, 2008). The results of math classes from 882 students show that growth in student achievement is significantly lower in general-track classes than in college-preparatory classes (Gamoran et al., 1997). Despite extensive research and criticism, tracking for mathematics remains a near-universal practice in American high schools (National Center for Education Statistics, 1994). In a meta-analysis of findings from 52 studies about ability grouping, studies in which high-ability students received enriched instruction in honors classes produced especially clear effects, while studies of average and below average students produced near-zero effects (Kulik & Kulik, 1982). Results of study by Cheung and Rudowicz (2003) revealed no significant detrimental effect caused by the ability-grouped class and the ability level of the ability-grouped class. Rather, students in classes that were more homogeneous according to past academic achievement tended to have significantly higher subsequent academic achievement and self-esteem. Ireson and Hallam (2009) also found high self-esteem in high ability groups. Wiliam and Bartholomew (2004) found differences in mathematics achievement between ability-grouped students and formal whole classes. A study by Shields showed that some form of homogeneous grouping benefits the most able and gifted students in terms of their academic achievement, as well as their attitudes concerning themselves as learners and regarding their school experiences (Shields, 2002). As for self-concept, pupils in the higher sets tended to have higher self concepts; pupil preferences for setting were greater in the higher year groups, as was the extent to which the top set was perceived to be the best (Hallam & Deathe, 2002). Ability grouping also increased the probability of choosing the peer as best friend (Hallinan & Sørensen, 1982).

Schools with more mobility in their tracking systems, meaning less inequality, produced higher math achievement scores overall (Gamoran, 1992). Charter Public School (fewer mixed ability classes 20%) student gains in each group were larger than those of Traditional Public School (more mixed ability classes 50%) students in similar groups, and the gains of students in the high ability group were greater than those in the low ability group, contributing to increasing inequality over the school year (Berends, Donaldson, 2011). According to McEwin et al. (2003) and Phuong-Mai et al. (2008), a majority of American middle schools favor tracking, that is, students grouped based on similar levels of capacity. Results from both the questionnaire survey and interviews in the intervention study confirmed that the students were more interested in being grouped with their friends.

Grouping Debates at University and Student Selection in Turkey

Student grouping in classes has been a controversial issue for universities educating highest achievers and comparatively low achievers in the same class, which is reflected by confusion among universities about whether scholarship and tuition fee students should be

taught together. On the other hand, in the case of universities there is very little research about ability grouping of college students (Bosco, 2009). Bosco (2009) studied a group of college geology classes and concluded that students should be grouped heterogeneously. In a study with gifted youth, on the whole, the participants perceived homogeneous grouping more positively with respect to academic outcomes. They learned more in the more challenging environment provided by homogeneous classes. However, they had mixed feelings about which setting better met their social needs (Adams-Byers, Whitseel & Moon, 2004).

Economics is another factor to take into account when deciding on mixed ability classes. Mixing treatment has a positive but statistically insignificant effect on average adulthood earnings. While mixing has positive effects on low ability students' adulthood earnings, it has smaller or even negative effects on higher ability students (Kang, Park, & Lee, 2007). Due to the concerns about class content, pace and teaching methods, most teachers have a positive attitude toward ability grouping. One overall result would be what Ireson et al. found; pupils attaining higher levels make more progress in sets, whereas pupils attaining lower levels make more progress in mixed ability classes (Ireson et. al., 2002).

In the Turkish context, students have to take a compulsory countrywide exam in order to enter university. Exam results are made public and students are required to apply universities online over the institution that makes the exam. No university gets its students itself; placement is made centrally as well, depending on student preferences and their scores in related areas. Because students select departments considering prior scores, location or name of the university (Orhan et. al., 2015), students with similar ability study in the same department. As for foundation universities, they also take students via the same system, no distinction is made between foundation and public universities when it comes to student preferences but foundation universities get students into the same department at three or four levels; full scholarship, %50 scholarship, %25 scholarship and tuition-fee. Departments have different codes for each type of student, but after enrolment in the university the students all study at the same department in the end. Because students with different abilities study at the same class, there is a strong need to inquire about how they perceive the situation. In one class at a foundation university students were placed into classes with regard to their achievement at the standard exam. Considering the possibilities of adverse consequences the administration decided to mix the both groups into heterogeneous groups. The study aims to shed light to the question of how the perception of undergraduate students will be influenced by this change over time. Besides, how the GPAs of the students were influenced by the change from ability to mixed ability grouping over time was sought.

Method

The study makes use of qualitative method and survey method by way of semi structured questionnaire and a likert scale form of the same questionnaire.

Participants

Freshman students at a department from a social sciences faculty who started at two different sections grouped according to their level of prior achievement (as a result of a nationwide compulsory exam) took courses for one semester inability classes and then studied in mixed ability classes for the rest of the undergraduate program. The complete group in two sections consisted of 52 students, 27 of whom were scholarship and half scholarship students and 25 of whom were tuition-fee students. 45 students out of 52 responded to the questions in

both questionnaires. For the Friedman test, which is used with data that are not normally distributed, few in number and ordinal, the data of 15 students qualified, which means 15 responded to all three questionnaires. For the Mann-Whitney U test, a total of 45 students qualified.

Process

Students took courses in either one of two ability groups for one semester and then both groups were mixed up to form two heterogeneous classes. Mixing both groups did not take into account any other factors. That is, selection of students to groups was completely random. Before mixed ability classes, when they were taught in ability groups, they were asked five questions about their expectations of mixing the groups. The reason is that use of pretest scores helps to reduce error variance, thus producing more powerful tests than designs with no pretest data (Stevens, 1996). Students in both sections already knew each other in a bigger group because of a pass-fail course taken by all students. They observed each other and, they had some notion of what the other students/their fellow peers were like. In the first place, all students were given an open-ended item survey asking five questions about a) unification of classes and its effect on their psychology, b) unification of classes and their academic achievement, c) unification of classes and their course studies, d) unification of classes, extra activities and social lives, and e) how the other students influenced them, and they were expected to fill in a likert scale questionnaire about the same issues. After forming mixed ability groups they took classes for one semester and then they were given the questionnaire once again to see if there was a change in ideas. Because time may have had an influence on student ideas, the same questions were asked again at the end of the second year (for the third time) to see if there were any other differences. Reliability coefficient of the questionnaire for Cronbach's Alpha was 0,846. As 15 students answered all the questions and filled in the likert scale questionnaires throughout three measurements without missing any data, Friedman test was conducted. When the data over more than two times is measured with ordinal scale, Anova would not be suitable. To see the difference between pairs Wilcoxon sign test was carried out as the measurements were dependent. To test the significance between the differences in ideas of scholarship and tuition-fee students, the Mann-Whitney U test was carried out because the number of students was not enough for t test.

Findings

Findings about questionnaires

Out of 52 students in class, 45 responded to at least two questionnaires. Eleven tuition-fee students and 4 scholarship students did not answer the second form after the second semester. The Mann Whitney U test, which tested for the differences between scholarship and tuition-fee students, was carried out with 45 students. 15 students answered all three questionnaires over two years, which means Friedman test was carried out with 15 students. Pre and two post semester questionnaires were matched and compared. The findings are given in table 1.

Table 1 Friedman Test and Wilcoxon Sign Test Results for Items 1-5

		Friedman Test				**Wilcoxon Sign Test**		
Item	**Time**	**Mean Rank**	χ^2	**df**	**p**	**Median**	**Difference**	**Z**
Item1	time1	1,87	2,056	2	0,358			

	time2	1,90						
	time3	2,23						
	time1	1,60				2,0		
Item2	time2	1,90	8,400	2	0,015	2,0	time1-time3	-2,825 (0,005)
	time3	2,50				3,0		
	time1	1,87						
Item3	time2	1,93	1,806	2	0,405			
	time3	2,20						
	time1	1,90						
Item4	time2	1,80	3,937	2	0,140			
	time3	2,30						
	time1	1,50				2,50		
Item5	time2	2,17	7,778	2	0,020	3,0	time1-time2	-2,138 (0,033)
	time3	2,33				3,0		

N=15

Repeated measures test of Friedman with ordinal data for five items produced differences in two of the items over time; Item2 and Item 5. In item1, there was statistically significant difference in attitudes about the academic achievement of scholarship and tuition fee students in time $\chi^2(2) = 8{,}400$, $p=0{,}015$. There was also statistically significant difference in item5 in attitudes about the perception of the other by scholarship and tuition fee students in time $\chi^2(2) = 7{,}778$, $p=0{,}020$.

In item 2, Wilcoxon signed-rank test showed student responses over three terms did change significantly for the negative. There was a change in attitudes between time1 and time3 ($Z=-2{,}825$, $p=0{,}005$). Median for time1 and and time3 were 8,5 and 11 respectively.

Table 2 Mann Whitney U Test for the difference of attitude between scholarship and tuition-fee students*

Item	Group	N	Mean Rank	Sum of Ranks	U	Z	p
Item4	Scholarship	18	15,28	275,00	40,00	-2,122	0,034
2. term	Tuition-fee	8	9,50	76,00			
Item5	Scholarship	21	16,90	355,00	124,00	-2,246	0,025
1. term	Tuition-fee	19	24,47	465,00			

*Only the results with significant change were reported.

As for the differences between the attitudes of scholarship and tuition-fee students, out of 15 questions over three measurements, there were differences of attitudes only in the first term of the second question (How do you think your academic achievement will be influenced by mixing the classes?) and the first term of the fifth question (How will the other students influence you?). In other measurements both groups had similar ideas.

Table 3 Mann Whitney U test for the difference in GPA between time1 and time3 for scholarship and tuition-fee students

Group	n	Mean Rank	Sum of Ranks	U	Z	p
Scholarship	20	23,60	472,00	98,00	-2,398	0,016

Tuition-fee	18	14,94	269,00

In the first place difference between time1 and time3 was found for both groups and because groups were small (n=20, n=18) for t test , Mann-Whitney *U* test conducted to evaluate the difference between time1 and time3 GPAs of scholarship students and tuition fee students found significant difference; Z = -2.398, p <0 .05. Scholarship students had higher GPAs than tuition fee students in time3 with an average rank of 23.60, while tuition fee students had an average rank of 14.94, U = 98.0, p = 0.016.

Findings about Written Student Responses

For the question that asked about the psychological effect of the unification of classes, two of the low achieving students said it would have a positive influence and four of them said it would have a negative one. One said it wouldn't influence anything and another said it would be hard to concentrate. The two who said it would have a positive influence and one said it had no negative effect at the end of the semester. Three said unification of classes influenced negatively, one said it influenced very negatively. Two of them did not give an answer to the question.

As for the high achievers, six of them said it would have a negative impact, four said it would have no effect. One said "*it may be nice to meet with others*", and one said "*sociable friends in the other section will motivate me*." One said it would influence him/her positively in the future. One said "*not having old friends may be a problem*", and another student did not want to get used to new friends. One was concerned about the other group's desire to have a good time. The student who said it would influence her very badly said it did influence very badly after five months. Two of the low achieving students said they would be influenced positively and at the end of the second term both said they were not influenced negatively.

As for the unification of classes and academic achievement, higher achievers were more concerned about the level of education given than the other students. Four of the low achieving students had similar ideas after unification. One who said it would have positive effects said it had both good and bad sides and one who said it would have a negative influence said it had no influence (after five months). High achievers were influenced positively in terms scores and seven said there was no change. Their problems were as could be expected; simplified courses, which bring about loss of motivation in high achievers. Eight of the students expressed negative attitudes (*simple, boring classes*) and two had positive attitudes (due to high scores).

Two of the three students who said course studies will be influenced negatively said they were negatively influenced. One said nothing had changed. (One of the two students who said they would study more really did so, whereas the other one said it had a negative influence. The one who said she missed silence in class said unification had positive and negative sides. The one who was concerned about scores; "*my scores may fall*"; she wanted to be in her old class.

Even if the question was not about achievement (extra activities and social lives), low achieving students' ideas are centred around classroom achievement. One answer to the question is "*I feel bad when I can't answer a question*". One student who had a positive attitude continued having the same attitude at the end of the following semester. High

achieving students are not concerned much about their social lives but they feel the need to express their concern about courses. One said that it would have an influence and added they had different social activities. Three of the high achieving students expressed comparatively different perspectives: One said: "*They should know how to behave if there is to be unification, their being noisy disturbs others*"; another said "*There are social differences as you can observe*" and the other said "*To do activities with people I don't like won't change the present dullness.*" While a low achiever said "*they (high achievers) are not social*" a high achiever saw them as being "*noisy*."

Discussion

As the Friedman test shows, students' attitudes towards the perception of their own academic achievement changed over time, which may be due to more heterogeneous scores in the class. Their studies were not affected, which might mean class unification did not make any change in student study behavior, and it did not make any change in their social activities out of class; their friendships were not influenced by uniting heterogeneous classes, at least as expressed by the students. This goes hand in hand with findings of Adams-Byers, Whitsel and Moon (2004). But it goes against findings of Chisaka (2002) who found ability grouping had a negative effect on the instruction and learning of learners placed in low ability classes and in social relationships of these learners and their peers in high ability classes (Chisaka, 2002). Personal encounters with instructors show most of them preferred ability grouping on account of holding intact classes.

Time has shown that students' attitudes towards the other group changed in time3. Of all five questions, scholarship and tuition-fee students had differing ideas in question-4 second term, and question-5 1st term. For the remaining 3 questions students had similar averages over three terms, which means they thought the same way towards ability grouping but had different concerns.

The Mann-Whitney U test for the change of difference in GPAs between scholarship and tuition-fee students showed there was significant change in scores favoring high achievers. Results proved fears of tuition fee students were realized because GPAs of tuition fee students decreased compared to scholarship students during the 2nd year. This result is also similar to the ones depicted at secondary or high school level.

Half of the high achievers expressed no influence while the other half used negative expressions about their psychologies and unification. More than half of low achievers used negative expressions about unification. Overall, students' ideas about unification with respect to social activities changed for the positive, high achievers' concerns centered around achievement and the classroom even in this question. It appeared that students were not as concerned about their social lives. In all questions high achievers had less concerns and their concerns were about the level of holding the class but most low achievers were scared because they could not keep up with others. These findings are similar to the findings of other research carried out at high school level.

There is ample literature that says low ability groups are given simpler tasks and work at a slower pace, which was the same concern for scholarship students. Pupils in high ability groups are also allowed more independence and choice, opportunities are provided for discussion, and pupils are allowed to take responsibility for their own work (Hallam & Ireson, 2005).

Student responses in the study were very similar to the findings of Hallam and Ireson (2005) which showed the curriculum was differentiated more in ability grouped classes by content, depth, the activities undertaken and the resources used. The less able were given more opportunities for rehearsal and repetition, more structured work, more practical work, less opportunities for discussion, less access to the curriculum, less homework with less detailed feedback, while work proceeded at a slower pace and was easier (Hallam & Ireson, 2005). Differences in pedagogy were evident in the responses of teachers who taught both mixed ability and ability grouped classes (Hallam & Ireson, 2005).

Most studies agree that high-ability students benefit from working with other high-ability students (Steel, 2005). Students who answered the questionnaire in the study expressed similar ideas (at university level) saying there were simplified courses and loss of motivation.

Hacker and Rowe (1993) found science teachers altered their pedagogy when they moved from sets to mixed ability classes. With mixed ability classes, teachers provided a greater variety of activities and more differentiated work, whereas they tended to use more whole class instruction with sets.

Results from both the questionnaire survey and interviews in the intervention study by McEwin et al. (2003) and Phuong-Mai et al. (2008) confirmed that the students were more interested in being grouped with their friends. It was the same for the group in the present study. Some of the high achieving students complained about easier classes, about which there has been a complaint for about a century; the superior students find no challenge and never develop their capacities if assigned only the average work (Reeve, 1956 cited in Welke & Bragg, 1958). One thing to suggest may be offering modifications in the curriculum to make room for the needs of high achievers as well. Flexible ability grouping, combined with appropriate curricular revision or differentiation, may result in substantial achievement gains both for average and high ability learners (Tieso, 2003).

A disadvantage to the repeated measure design is that it may not be possible for each participant to be in all conditions of the process (i.e. time constraints, location of experiment, etc.). The second disadvantage is that findings may not be generalizable to the public because of the limited number of participants.

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