

Should Special Program Students be Placed in Separate Course Sections?

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Abstract

This article describes the evaluation of separate discussion sections for special admissions students participating in a developmental program and attending an introduction to psychology course. In year one, the special admissions students were segregated into separate small enrollment discussion sections within the larger course. In year two, they were integrated into the regular discussion sections. Evaluation of grade performance between the two year periods and comparison of their performance with matched controls each semester revealed no differences. Therefore, the data suggests that segregated sections are not necessary for the success of these students and activities such as Supplemental Instruction (SI) promote more success.

Wambach and Huesman (2010) recently reviewed the literature on unique student populations and reported that underprepared students admitted to research universities are most likely to experience summer bridge programs, assistance from writing centers, tutoring, and Supplemental Instruction (SI) instead of developmental courses in reading, mathematics, and study skills. This development was predicted by Arendale (2000) in his overview of issues and challenges facing developmental education. The approach taken by research universities to create interventions for such students is also consistent with Wambach, Brothen, and Dikel's (2000) proposal for a new theoretical conceptualization of and Brothen and Wambach's (2005) subsequent proposal for a reinvigorated approach to practice in developmental education. This paper evaluates one aspect of these new approaches to interventions with underprepared students.

In the Fall Semester of 2008, the University of Minnesota instituted a new program called Access To Success (ATS), residing in three colleges (Education, Liberal Arts, and Natural Resources) that admitted underprepared students to special instructional programs. As the university website declares, "The mission of the ATS program is to help ensure the academic success of... students who have demonstrated strong potential to succeed, but whose high school records may not match the typical profile of students admitted to the college" (College of Liberal Arts, n.d., para. 2,3).

The program in the college of Liberal Arts targeted several large courses in the regular curriculum that were to have specially designed discussion sections with smaller enrollment dedicated only to ATS students. Each semester, students admitted to the program participated in an intensive advising program and attended an orientation course, a basic writing course, and two “content” courses such as the Introduction to Psychology course taught by the author of this paper.

For the psychology course, this meant that in addition to attending a large ($n = 700$) lecture three hrs/week, first year ATS students attended one of two 17 student discussion sections instead of the usual 32 student section one hour/week. The section leader (SL; a graduate teaching assistant) delivered lesson plans that reviewed major concepts and made herself available in and outside of class for student questions and extra help for students enrolled in targeted sections. Students also completed short writing assignments. These activities were basically the same as for all other students in the course. In addition, all students had online chapter quizzes to complete outside of class and a study guide that helped them prepare for three mid-semester exams and one final exam. The SL with the most teaching experience was assigned to the two ATS sections. She was also well versed in issues of student achievement and did individual interventions with students who were not doing well on exams, etc. Also, ATS students were invited (but not required) to attend an SI section run by the ATS program once each week that functioned according to standard SI principles and practices (Arendale, 2002).

Based on the first year data reported below, the students’ experience in the discussion sections changed for the second year. Brothen and Wambach (2005) suggested that integrating underprepared students in regular classes is preferable to segregating them in special course sections and that suggestion was implemented in year two. In the first year, the sections enrolled fewer students and thus were more expensive to teach than regular sections. In addition, the whole idea of special sections was not particularly liked by students. The SL reported widespread complaining by her students about the fact they had to be in separate sections rather than in ones that better fit their schedule preferences or allowed them to be in class with their friends. Accordingly, the special sections were eliminated for year two and the ATS program was required to schedule students in the regular sections with other non-ATS students.

The hypothesis in this study was that course performance of ATS students would not suffer from their integration into the regular sections. The data below details the evaluation of the two different ATS interventions for students in the course.

Method

Over the two years (four semesters) of this study, 134 students registered in the ATS sections and stayed in the course past the second week—long enough to receive official final grades at the end of the semester. The semester enrollment totals were Fall 2008: 33, Spring 2009: 29, Fall 2009: 31, and Spring 2010: 41. For each semester, matched control groups of equal sizes were created for the ATS students. To do this,

admissions data on all students was obtained from the University records office consistent with the University's Human Subjects protocols. The first matching criterion was that matches had to be a first year student in the college. The second criterion was that they had to have aptitude ratings similar to the corresponding ATS student. For each ATS student, a student was found with a similar score on the academic aptitude rating (AAR)—a measure created by adding a student's high school percentile rank (HSR) to a number obtained by doubling that student's ACT Comp score. The AAR is the University admissions office's basic rating of students for admission. Fifteen ATS students did not have high school rank data in their records so they were matched on first year/same college status and as close as possible on ACT Comp score. The author of this study has no ready explanation for why matched control students who were not in the ATS program were found in the course other than sometimes admissions criteria change during the admissions process or that some underprepared students were admitted after the ATS program had reached its enrollment maximum. Suffice it to say, equal numbers of students were found in the classes who were nearly identical to the ATS students on their measures of academic potential.

Results

The maximum possible AAR score is 171 (HSR of 99 + twice the maximum ACT score of 36). The "floor" for "automatic" admission to the College of Liberal Arts is approximately 145 and students with scores below that are subject to individual review. The means for all the freshman students were $AAR = 135.36$ ($SD = 14.99$) and $ACT\ Comp = 26.09$ ($SD = 3.33$). ATS students' and their matched controls' means were well below the floor. The total ATS sample had a mean score of 111.83 ($SD = 12.04$) and the matched controls had a mean of 113.13 ($SD = 10.84$). This difference was not statistically significant ($t = .878$, $p = .381$). For the 15 pairs of students matched on ACT Comp, the means were virtually identical (22.93 vs. 22.87) and not statistically different for ATS vs. matched controls.

The course assignments and grading standards did not change materially over the two years of this study. Nevertheless, to better compare students between semesters and years, standardized final course grades for the ATS and matched control students were computed by converting all possible letter grades to numbers ($F = 0$, $D = 1$, $D+ = 2$, $C- = 3$, $C = 4$, $C+ = 5$, $B- = 6$, $B = 7$, $B+ = 8$, $A- = 9$, $A = 10$) and calculating *z-scores* for all students in the class. Overall mean *z-scores* for the two years combined were $-.72$ ($SD = 1.03$) for ATS students and $-.54$ ($SD = 1.00$) for the matched controls (see Table 1).

Thus, ATS students achieved an average grade nearly three fourths of a standard deviation below the overall class mean whereas the matched controls were about one half standard deviation below it. These differences between ATS and matched controls did not reach statistical significance ($t = 1.404$, $p = .162$). The primary research question in this study is whether ATS students differed from controls within each semester over the two year study.

Table 1

Mean Standardized Grades by Semester and Student Groups

Semester	ATS z-grades	Control z-grades	N of pairs	<i>t</i> -test <i>p</i> -value
1	-.40	-.56	33	.498 (n.s.)
2	-.82	-.60	29	.254 (n.s.)
3	-.55	-.31	31	.362 (n.s.)
4	-1.03	-.67	41	.131 (n.s.)
Combined	-.72	-.54	134	.162 (n.s.)

Note. The four semesters of ATS Standardized Grades did not differ significantly from each other by post hoc Scheffe contrasts.

In the first semester of the study (see Table 1), ATS and control students did not differ on the selection variables of AAR and ACT Comp or on their course performance. Their standardized grade means were ATS $z = -.40$ ($SD = .95$) and Control $z = -.56$ ($SD = .91$). These differences were not significantly different ($t = .682, p = .498$).

In the second semester of the study, ATS and control students also did not differ on the selection variables of AAR and ACT Comp or on their course performance. Their standardized grade means were ATS $z = -.82$ ($SD = .93$) and Control $z = -.60$ ($SD = 1.02$). These differences were not significantly different ($t = 1.151, p = .254$).

In the third semester of the study—when ATS students were not segregated but distributed throughout discussion sections, ATS and control students once again did not differ on the selection variables of AAR and ACT Comp nor on their course performance. Their standardized grade means were ATS $z = -.55$ ($SD = 1.03$) and Control $z = -.31$ ($SD = .95$). These differences were not significantly different ($t = .919, p = .362$).

In the fourth and final semester of the study—ATS and control students again did not differ on the selection variables of AAR and ACT Comp nor on their course performance. Their standardized grade means were ATS $z = -1.03$ ($SD = 1.03$) and Control $z = -.67$ ($SD = 1.06$). These differences were not significantly different ($t = 1.526, p = .131$).

On the important criterion of course grade, ATS students did not differ significantly from controls in any of the semesters over the two year period. However, ATS students differed from each other on semester mean course grades over the course of this study. They varied from a “high” of .40 standard deviations below the mean in the first semester to a low of 1.03 standard deviations below the mean in the last semester. Analysis of variance revealed an overall significant difference in these means with $F(3,129) = 2.77$, and $p = .049$ but post-hoc Scheffe contrasts comparing each mean with the other three showed no statistically significant differences between all possible combinations of semester comparisons. Therefore, there were no systematic grade differences between ATS and between ATS and control students for any of the four semesters in this study.

Finally, the possibility remained that ATS students were disadvantaged by elimination of the small, intensive sections used in year one and their subsequent integration into the regular sections in year two. Because initial selection of students for the ATS program was not entirely based on AAR but also included examination of high school courses taken and extra-curricular activities engaged in, comparisons between ATS and controls for specific semesters may not tell the entire story. Comparison of all ATS students from year one with all ATS students in year two could possibly show differences. Accordingly, AAR and course grades of ATS students over both semesters within each year were combined. Year two ATS students had slightly higher AAR scores than students in year one (113.16 vs. 110.39) but these differences were not statistically different ($t = 1.26, p = .210$). Mean standardized grades for ATS students in year one ($z = -.60, SD = 1.08$) did not differ statistically from ATS students' grades in year two ($z = -.82, SD = .95$) with $t = 1.237, p = .218$. Overall, no differences existed between ATS and control students in several ways of comparing them.

Discussion

The data from this study indicates that segregating underprepared students in special, intensive sections of introductory psychology was not beneficial to their course performance. In addition, the value of the ATS program as a whole did not reveal itself to be necessary for student success in the introductory psychology course. Students not part of the ATS program matched on similar selection variables for ATS had higher (but not statistically significant) grades in the course. However, because they were not in the ATS program, there could have been other factors affecting their performance in our course. It is thus not possible to draw precise conclusions about the overall value of the ATS program from the results of this study.

Implications

It is reasonable to conclude that special course sections such as the ones used in year one are not crucial to the success of underprepared students. The overall course design was consistent with the model of Universal Instructional Design (UID) detailed in Brothen, Wambach, & Hansen (2002) in which the course structure is flexible enough for all students to be successful if they engage the material. The learning support activities in the class were designed to meet all students' needs. For example, students could take online chapter quizzes as many times as they needed to get feedback on their learning progress and their highest scores counted toward their grades. It is reasonable to say that this UID approach is better than segregating students and the data from this study supports this assertion.

If, as Arendale (2000) has suggested, programs such as those of the University of Minnesota's ATS Program are becoming more common at four-year colleges and universities to deliver developmental education interventions to underprepared students, studies such as the one reported here will be necessary to guide planning and implementation of these programs. The results of this study suggest that academic administrators should work with faculty to find ways for all students to be successful instead of dividing courses into segments for different students. This includes

designing courses consistent with principles of UID along with providing opportunities such as SI—particularly if it addresses particular student needs (cf., p.88., Madyun, Grier, Brothen, & Wambach, 2004).

Further Research

It is also clear that further research needs to be done to determine what is effective in such environments. The findings in this study suggest that in year two, because ATS students were not in a special section, they may have decided they needed more work in the SI section. In this interpretation, although year one ATS students got extra attention in smaller sections led by a highly experienced instructor, it was likely easily replaced by the SI experience. To test this possibility, attendance data was collected from the instructor who ran the SI section for the ATS students and correlated with course grade. In the first year, the relationship was near zero ($r = +.079$, n.s.) but in year two, it was substantial ($r = +.682$, $p = .01$). In addition, students in year two attended more SI sessions ($M = 9.00$, $SD = 4.03$) than those in year one ($M = 7.40$, $SD = 4.69$) and this difference was statistically significant with $t = 2.02$, $p = .045$. The SI section was not run differently over the two year period but ATS students in year two appear to have benefitted more from it.

Research on SI has a long history (Arendale, 2002). But a new look at SI and other interventions should be done with a new generation of students in new settings. In particular, this study suggests intensive evaluations of ATS type programs and the interventions they use should be ongoing to determine what works and how such programs should be structured.

References

- Arendale, D. (2000). Strategic planning of the National Association for Developmental Education. *Journal of Developmental Education*, 23(3), 2-10.
- Arendale, D. (2002). History of supplemental instruction (SI): Mainstreaming of developmental education. In D.B. Lundell & J. L. Higbee (Eds), *Histories of Developmental Education* (pp. 15-28). Minneapolis, MN: Center for Research on Developmental education and Urban Literacy, General College, University of Minnesota.
- Brothen, T., & Wambach, C. (2005). Refocusing developmental education. *Journal of Developmental Education*, 28(2), 16-18, 20, 22, 30.
- Brothen, T., Wambach, C., & Hansen, G. (2002). Accommodating students with disabilities: PSI as an example of universal instructional design. *Teaching of Psychology*, 29, 239-240.
- College of Liberal Arts. (n.d.). *Access to Success Program*. Retrieved from <http://discovercla.umn.edu/academics/ats.html>.
- Madyun, N., Grier, T., Brothen, T., & Wambach, C. (2004). Supplemental instruction in a PSI general psychology course. *Learning Assistance Review*, 9(1), 7-16.

- Wambach, C., & Huesman Jr, R. L. (2010). Unique student populations: Describing their needs and outcomes. Manuscript under editorial review.
- Wambach, C., Brothen, T., & Dikel, T. N. (2000). Toward a developmental theory for developmental educators. *Journal of Developmental Education*, 24(1), 1-29.

