

THE INFLUENCE OF BACCALAUREATE AVERAGE SCORE ON ACADEMIC ACHIEVEMENT OF UNDERGRADUATES

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ABSTRACT. The present study researched: 1.The correlation among the baccalaureate average grade for admission to the university and average grades earned each semester 2. The correlation among grades for each semester of the three year program. The data used in this study includes scores and grades for the 125 students who had taken their entrance exam in the 2012/2013 academic year. Data was analyzed using the Bravais-Pearson correlation coefficient and the Cohen criteria for analyzing effect size. The results indicate that there is a significant positive correlation between the entrance scores and the grades for the first five semesters. The data indicate that the correlation between the exam average and GPA average is not significant for the last semester. The effect size scores indicate that this significance is medium for the first two semesters (.48 and .43); the effect size is low for the next three semesters (.37, .22, .20). The results also indicate there are significant positive correlations between the GPA of each of the semesters. These results indicate that each semester's GPA average has a high effect size score for the subsequent semesters. The effect size scores are lower for each subsequent semester but remain in the high effect size levels, ranging from .82 to .72. The conclusion drawn from this data is that in order to develop more consistent decision-making predictions the university should use both baccalaureate averages and GPA both in the transition from high school to university and between semesters and years within the university program.

Key words: *Pedagogy of primary and Preschool Education, baccalaureate exam average grade, average grade per semester, GPA, access requirements, academic success*

ZUSAMMENFASSUNG. Die vorliegende Studie erforschte: 1. Die Korrelation zwischen dem Bakkalaureat Durchschnittsnote für die Zulassung zur Universität und die Durchschnittsnoten erwarb jedes Semester. 2. Die Korrelation zwischen

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den Noten für jedes Semester des Dreijahresprogramm. Die Daten verwendet in dieser Studie umfassen Noten und Wertungen für 125 Studenten, die ihre Aufnahmeprüfung im Studienjahr 2012/2013 übernommen haben. Die Daten wurden mit dem Bravais-Pearson-Korrelationskoeffizient und die Cohen Kriterien für die Effektgröße analysiert. Die Ergebnisse zeigen, dass es eine signifikante positive Korrelation zwischen den Eingangswertungen und die Noten für die ersten fünf Semester gibt. Die Daten zeigen, dass die Korrelation zwischen der Prüfung Durchschnitt und GPA Durchschnitt für das letzte Semester nicht signifikant ist. Die Effektgröße Werte zeigen, dass diese Bedeutung für die ersten beiden Semester Medium ist (0,48 und 0,43); die Effektgröße ist für die nächsten drei Semestern niedrig (0,37, 0,22, 0,20). Die Ergebnisse zeigen auch, dass es eine es signifikante positive Korrelation zwischen der GPA jedes Semester gibt. Diese Ergebnisse zeigen, dass GPA Durchschnitt jedes Semesters eine hohe Effektstärke- Wert für den nachfolgenden Semestern hat. Die Effektgröße Werte sind niedriger für jedes weitere Semester aber bleiben in den hohen Effektgröße Niveaus, von 0,82 bis 0,72. Die Schlussfolgerung anhand diesen Daten ist, dass, um einheitlichere Entscheidungsfindung Prognosen zu entwickeln, sollte die Universität sowohl Bakkalaureat Durchschnittswerte und GPA in den Übergang von Gymnasium zur Universität und zwischen Semester und innerhalb Jahren der Universität Programm verwenden.

Schlüsselwörter: *Pädagogik der Grund- und Vorschulbildung, Abitur-Prüfung Durchschnittsnote, Notendurchschnitt pro Semester, GPA, Zugangsvoraussetzungen, akademischen Erfolg*

Literature Review

There have been many attempts to work on retention and graduation rates of university students. Ellucian (n.d.) has pointed out that about 60 percent of students who enter college graduate within six years of entry. The information for two year institutions is even worse. This issue is important for students because according to the 2013 *Digest of Education Statistics*, the National Center for Education Statistics students who graduate from high school earn 70% more than students with a high school diploma. From an ethical standpoint this is an issue for universities that knowingly accept a student body from which 40% will drop out of the university and never return.

Tinto (1993) has developed the theory that student retention or attrition is based upon factors from both the social and academic life of the student. He also has taken into consideration the ideas of Bean and Eaton (2000) which indicate that student retention is affected by experiences and the environment

outside and inside of the institution. Tinto's (1993) belief is that students who are successful in university learn how to negotiate the transitions into and within the university. In fact he has stated that in order to be successful in schools students separate themselves from their previous lives and fully engage in their university life. Bean (2012) has stated that there are some very common attributes or disadvantages that students who drop out of college tend to possess. He states:

- The highest institutional retention rates in the country are above 95 percent, while the lowest may be only 10 percent;
- Typical graduation rates for elite schools may be 85 percent or higher; for average schools about 50 percent; and for non-elite schools 15 to 25 percent;
- Freshmen are most likely to drop out of school, while seniors are least likely to leave. For an average institution, freshman to sophomore year attrition is about 25 percent; sophomore to junior year attrition is about 12 percent; junior to senior year attrition is about 8 percent; and about 4 percent of seniors might leave school. Roughly half of an incoming class graduates in four to five years. (p. 3).

Students who start from disadvantaged backgrounds have the highest likelihood of dropping out of college. Hosler and Bean (1990) point to the importance of strategically identifying students who are at risk in order to develop programs or processes to help these students to be more successful.

McKenzie and Schweitzer (2001) indicate that academic success is influenced by multiple factors. These predictive factors include: academic abilities, psychological factors, cognitive traits, and demographic circumstances. The authors note that test scores account for less than half of the variance in student GPA averages. In agreement with Bean and Tinto, the authors point out the importance of looking beyond standardized test scores. In addition McKenzie and Schweitzer point out the fact that attrition cannot be completely attributed to poor grades. In other words, some students with low grades do retain and recover to graduate, while some students with high grades do drop out of university. Both Tinto and McKenzie and Schweitzer agree that factors like satisfaction with the university, financial issues, career goals, and social support are important factors in student retention or attrition. For example, Himelstein (1992) points out that career goal changes in students can negatively affect grades.

According to Tinto (1993) and Bean (2012) we know that academic success is a positive predictor of student success at the university level. Although there are exceptions the trend is clear that many more students who are successful retain in university and a high percentage of students who struggle

leave the university. Both authors agree that universities should develop multifaceted and strategic approaches to help students succeed at university. A common set of procedures would include the following elements: 1. Create a shared vision for student success. 2. Develop a focus on what successful students do. 3. Identify students who might be or are at risk and develop strategic interventions early. 4. Begin with one program at a time and grow strategically. 5. Build bridges across the university and between the university and the outside community. 6. Collect and use data to strategically take action.

The goal is to identify who needs assistance and develop effective ways to assist students. Additionally, the climate of the university should be a positive and supportive one. The process should be systemic throughout the university. Fitzgerald and Laurian (2012) point out the importance of developing a caring community for student success. Laurian (2015) has demonstrated that students want and need support academically and emotionally from their advisors. Johnson and Fitzgerald (2013) have also displayed the importance of academic and social support for university students both from their professors and their colleagues. In line with Tinto (1993) and Bean (2012) they have indicated the importance of setting the stage for success for all students. Laurian-Fitzgerald, Popa, and Fitzgerald (2015) also found in their research that creating positive habits in relationships among the professor and students and among students in class enhanced academic learning.

How the university makes its entrance decisions are important for the entire institution. Roșeanu and Drugaș (2012) in their study of university entrance decisions found that high school average grades were more accurate in predicting student success at the university than were the baccalaureate exam scores and grades in high school psychology classes. Their research agrees with the conclusions of Geiser and Santiceles (2007) who state that high school GPAs consistently outperform exam scores in predicting university academic success for first year students. Their research also indicated that high school GPAs also are more effective predictors than test scores throughout students' years at the university. Both sets of researchers agree that the idea that test scores are the best predictors of student success is a misconception. Chamorro-Premuzic and Furnham (2003) have found that personality traits are significantly related to academic achievement for university students. Harackiewicz, Tauer, Barron, and Elliot (2002) in their research found three effective predictors of academic success at the university: academic achievement goals, ability, and high school performance.

Research Method

Goal

The study aims to determine if the correlational relationship among college entrance scores (bacalaureate exam average score) and average grades per each of the three academic years for the *Pedagogy of Primary and Preschool Education (PPPE)* study program. Additionally, this study aims to determine the correlational relationships among grades within each of the semesters of the program.

Subjects

The data gathered for this study was developed from the bacalaureate exam average scores and semester averages for 125 students in the education department from the University of Oradea, Faculty of Social and Humanistic Sciences, specialization of PPPE at both modes of education, full-time learning in Oradea (N=62) and in Beiuş (N=42) and blended weekend classes (N=21) who had taken their entrance exams in 2012-2013 academic year and who passed each semester of the three academic years.

Method

Data analysis and interpretation were conducted based on the entrance exam scores and GPA averages for students that managed to get all the necessary number of credits per each semester. The entrance exam class average and each semester class GPA average were reviewed and compared to each other for each of six semesters of the program. These scores were analyzed using the Bravais-Pearson correlation coefficient for significance and the Cohen criteria for analyzing effect size. According the Bravais-Pearson scores below .05 are considered to be significant. According to Cohen's criteria, scores from the Bravais-Pearson of .32 and lower are considered to have a low effect size. Scores between .33 and .55 are considered to have a medium effect size. Scores between .56 and 1 are considered to have a high effect size.

Results

Research data were analyzed for significance using the Bravais-Pearson's correlation coefficient, after the conditions of conducting it had been verified. The conditions of verifying included a determination of the normal curve distribution, which was checked by Kolmogorov-Smirnov Z test.

The results for the baccalaureate average exam grade used for entrance requirements as well as the academic results per each semester of the three academic years resulted in scores for both modes of education that were at a significance threshold higher than the critical value of .05.

Data analysis for Bravais-Pearson's correlation coefficient show there is a significant positive correlation between the entrance scores and the academic results at the end of each the first five study semester. There was no significant correlation between entrance scores and the results of the last semester of the 3rd year of study (see Table 1).

In relation to Cohen's criteria (1988), the relationship between variables has a medium effect size for the correlations between exam average and the first three semesters that have statistically significant results (see Table 1). The effect size for the fourth and fifth semesters is low. The sixth semester correlation to the exam average is not significant. By calculating R^2 coefficient of determination, we can state that baccalaureate-average-score variable explain the variance of average grades per semester: 23% of it in the 1st sem. ($r=.479$, $df=120$, $p<.001$), 18% in the 2nd sem. ($r=.432$, $df=123$, $p<.001$), and the percentages are lower and lower with each of the following semesters – 13% in the 3rd sem. ($r=.432$, $df=123$, $p<.001$), 4% in the 4th sem. ($r=.223$, $df=110$, $p=.009$) and 2% in the 5th sem. ($r=.204$, $df=111$, $p=.015$).

There are positive correlations between the academic results of each of the semesters of the three academic years (see Table 1). The academic average grade per 1st semester significantly and positively correlates with the average grades obtained in each of the other five semesters. Thus, 68,3% of the variance of the 2nd semester results is explained by the 1st semester results ($r=.827$, $df=121$, $p<.001$), 62,4% in the 3rd semester ($r=.790$, $df=109$, $p<.001$), 50,4% in the 4th semester ($r=.71$, $df=108$, $p<.001$), 37,6% in the 5th semester ($r=.614$, $df=111$, $p<.001$), and 27,5% in the 6th semester ($r=.525$, $df=110$, $p<.001$).

Similar results are encountered with the correlations between average grades per semesters (see Table 1). We noticed there are higher R^2 coefficients of determination between the average grades of a semester with the previous semester (except the 3rd semester with the 4th semester), which means the variability of one semester's results is explained in a higher proportion by the results obtained in the previous semester. Thus, when associating average grades per 5th semester with those per 6th semester, there is $R^2=.517$ (51,7% of the variance of results in the 6th semester is explained by the grades obtained in the 5th semester) as compared to $R^2=.275$ in the 1st semester (27,5% of the variance of results in the 6th semester is explained by the grades obtained in the 1st semester).

Table 1. Pearson’s correlation coefficients for college-entrance-average-grade and average-grades-per-semester-and-academic-years variables

		1sty_1 st sem_av. grades	1sty_2 nd sem_av. grades	2ndy_3 rd sem_av. grades	2ndy_4 th sem_av. grades	3rdy_5 th sem_av. grades	3rdy_6 th sem_av. grades
Pearson Correlation	entrance_exam_av.	.479**	.432**	.372**	.223**	.204*	.149
Sig.		.000	.000	.000	.009	.015	.059
Effect Size		Medium	Medium	Medium	Low	Low	Low
Pearson Correlation	1 st y_1 st sem_av. grades		.827**	.790**	.710**	.614**	.525**
Sig.			.000	.000	.000	.000	.000
Effect Size			High	High	High	High	Med.
Pearson Correlation	1 st y_2 nd sem_av. grades			.763**	.650**	.717**	.522**
Sig.				.000	.000	.000	.000
Effect Size				High	High	High	Med.
Pearson Correlation	2 nd y_3 rd sem_av. grades				.734**	.811**	.681**
Sig.					.000	.000	.000
Effect Size					High	High	High
Pearson Correlation	2 nd y_4 th sem_av. grades					.759**	.716**
Sig.						.000	.000
Effect Size						High	High
Pearson Correlation	3 rd y_5 th sem_av. grades						.719**
Sig.							.000
Effect Size							High

When the data is disaggregated by the mode of program there are some interesting differences (see Table 2). Data analysis for students enrolled in the full-time learning mode of education show there is a significantly positive correlation between college entrance scores and average grades per 1st semester ($r=.420$, $df=99$, $p<.001$), per 2nd semester ($r=.354$, $df=99$, $p<.001$), per 3rd semester ($r=.317$, $df=92$, $p=.002$), and for the 5th semester ($r=.208$, $df=91$, $p=.045$), but not for the other two semesters (correlation between baccalaureate average grade and average grade per 4th semester $r=.193$, $df=91$, $p=.064$, correlation between baccalaureate average grade and average grade per 6th semester $r=.152$, $df=92$, $p=.143$).

According to Cohen’s criteria (1988) for effect size, the relationship between variables has a medium effect size for the semester one and two correlations that have statistically significant results (see Table 2). The other two statistically significant correlations have a low effect size (semesters three and five). By calculating R² coefficients of determination, we can state that the baccalaureate-average-score variable explains the variance of average grades per semester only in low percentages: 17,6% of the results in the 1st semester, 12,5% in the 2nd semester, 10% in the 3rd semester, and 4,3% in the 5th semester.

Table 2. Pearson’s correlation coefficients for college-entrance-average-grade and average-grades-per-semesters-and-academic-years variables for full-time learning students

		1 st y_1 st sem_av. grades	1 st y_2 nd sem_av. grades	2 nd y_3 rd sem_av. grades	2 nd y_4 th sem_av. grades	3 rd y_5 th sem_av. grades	3 rd y_6 th sem_av. grades
entrance_a v.grades for full- time learning	Pearson Correlation	.420**	.354**	.317**	.193	.208*	.152
	Sig.	.000	.000	.002	.064	.045	.143
	Effect Size	Medium	Medium	Low	Low	Low	Low
1 st y_1 st sem_av. grades	Pearson Correlation		.818**	.781**	.690**	.657**	.521**
	Sig.		.000	.000	.000	.000	.000
	Effect Size		High	High	High	High	Medium
1 st y_2 nd sem_av. grades	Pearson Correlation			.779**	.630**	.771**	.569**
	Sig.			.000	.000	.000	.000
	Effect Size			High	High	High	High
2 nd y_3 rd sem_av. grades	Pearson Correlation				.795**	.833**	.719**
	Sig.				.000	.000	.000
	Effect Size				High	High	High
2 nd y_4 th sem_av. grades	Pearson Correlation					.756**	.725**
	Sig.					.000	.000
	Effect Size					High	High
3 rd y_5 th sem_av. grades	Pearson Correlation						.721**
	Sig.						.000
	Effect Size						High

Data analysis for Bravais-Pearson's correlation coefficient for blended weekend classes mode of education show there is a significant positive correlation between the entrance scores and the average grades per 1st semester ($r=.704$, $df=18$, $p<.001$), per 2nd semester ($r=.766$, $df=22$, $p<.001$), and 3rd semester ($r=.589$, $df=22$, $p<.001$), but not for the other semesters (see Table 3).

In relation to Cohen's criteria (1988) for the weekend classes, the data indicate that the relationship between variables has a high effect size for all three correlations statistically significant results (semesters one, two, and three). By calculating R^2 coefficients of determination, we can state that baccalaureate-average-score variable explains the variance of average grades per semester in proportion of 48% in the 1st semester, 58% in the 2nd semester, and 34% in the 3rd. There were no statistically significant results for the correlations between baccalaureate average grade and the average grades per the next three semesters; but there were also relationships of positive association between the grades of one semester with the previous semester (see Table 3).

Table 3. Pearson's correlation coefficients for college-entrance-average-grade and average-grades-per-semesters-and-academic-years variables for blended weekend classes students

		1 st y_1 st sem_av. grades	1 st y_2 nd sem_av. grades	2 nd y_3 rd sem_av. grades	2 nd y_4 th sem_av. grades	3 rd y_5 th sem_av. grades	3 rd y_6 th sem_av. grades
entrance_av. grades for blended weekend classes	Pearson Correlation	.704**	.766**	.589**	.300	.193	.128
	Sig.	.000	.000	.002	.212	.415	.612
	Effect Size	High	High	High	Low	Low	Low
1 st y_1 st sem_av.grades	Pearson Correlation		.894**	.848**	.792**	.532*	.568*
	Sig.		.000	.000	.000	.013	.011
	Effect Size		High	High	High	Medium	High
1 st y_2 nd sem_av.grades	Pearson Correlation			.853**	.650**	.568**	.416
	Sig.			.000	.001	.007	.061
	Effect Size			High	High	High	Medium
2 nd y_3 rd sem_ av.grades	Pearson Correlation				.650**	.742**	.500*
	Sig.				.003	.000	.041
	Effect Size				High	High	Medium
2 nd y_4 th sem_av.grades	Pearson Correlation					.821**	.767**
	Sig.					.000	.000
	Effect Size					High	High
3 rd y_5 th sem_av.grades	Pearson Correlation						.731**
	Sig.						.000
	Effect Size						High

Conclusions

After analyzing the research data for the entire population of PPPE students from the University of Oradea who had been successful in completing their programs, we reached the conclusion that there is a positive relationship between the bacalaureate average exam scores and the average grades per the first five semesters of university. But the effect sizes at the end of each of these five semesters were medium for first three semesters and low for the last three semesters. This means that using the exam average to predict success in the university is moderate to low. When analyzing the GPA averages for the students in each semester we found the effect sizes to be significantly higher than those of the entrance exam averages. This means that the predictive value of each semester's grades is more accurate and significant than are the exam averages.

From these results we have determined that only using the exam scores for entrance into the university has a moderate to low chance of predicting which students will succeed academically at the university. It appears that using grades might lend more accuracy to the entrance requirements because they consist of multiple elements of the academic lives of our students: work ethic, collaborative abilities, learning abilities, dedication to task, resilience, motivation, etc. It appears that by combining examination scores with GPA would enhance the ability of the university to more accurately develop the student body. We also believe that it might enhance the process more significantly to also incorporate teacher recommendations the entrance materials for potential students. People who know the attitudes, aptitudes, work ethic, resilience, motivation, and other important qualities of their students would give the university vital information about our potential students.

Another conclusion drawn from this research is the importance of success for students each semester. Since the highest level of prediction found in this study was the GPA from the previous semester we believe that we as a university system might be able to take advantage of that relationship. Since students face different challenges each year, the university might develop a multifaceted approach for our work students. For example, first year students who are transitioning into college have very different issues and needs than do third year students who are excited to transition out of the university into the next stages of their lives. Students in the weekend program have different needs than do students in the day full-time program. The important point here is to contemplate what kinds of procedures would be worthwhile to develop in order to give our students the greatest chance of success in the university and in their careers. In alignment the Bologna agreement we agree that creating a student-centered climate built upon success would benefit all constituencies in the university.

We recommend that further study be investigated in relation to the effectiveness of entrance requirements to the university. Since relying on the average score for the baccalaureate exam demonstrates medium to low predictive capacity, it would make sense to investigate ways to add to these scores for entrance requirements. There are obviously more factors to academic success than a single score can demonstrate. Harackiewicz, Tauer, Barron, and Elliot (2002) recommend from their research that universities consider a multiple goals perspective in working toward student interest and success. The results of our study agree with their conclusions.

Our findings support the idea that baccalaureate average grade of PPPE students in blended weekend classes determines with an average intensity the variance of their results in the first year of study. However, these grades should be rather carefully interpreted because of the low number of subjects.

Because there were high coefficients of determination for the correlations between average grades per semesters, the uttermost finding is that baccalaureate average score is not an only indicator to further influence academic grades in college. A further on study based on regression analysis with variables like: type of graduated high school, average grades in specific school subjects (Pedagogy, Psychology, Special Psycho-pedagogy) or assessment of skills (diction, Arts, Music) or of student activities interest (Holland Questionnaire) could give additional information on variables that could explain academic performance or failure of PPPE students.

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