

Post-Secondary Education Options and the Rate of Persistence to Graduate Studies: Trend in a Minnesota Higher Institution between 2007 and 2019

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Abstract

Earlier research on Post-Secondary Enrollment Options (PSEO) has produced insights on policies, with emphasis on legislating the enrollment of high-school students who are taking college credits through the program. Previous studies have focused on what are considered impediments to the program, improving governance, and assessment, with a view on academic performance in undergraduate programs, however, with limited attention to higher learning and lifelong learning. Based on the literature, PSEO has served as an early pathway to higher education for academically advanced students, which has also served as a good form of transition to higher education. Despite this, so much is unknown about various aspects of the success of the program. This current study focus specifically on the rate of PSEO participant who enters a graduate and or professional degree program after earning an undergraduate degree, based on admittance in a Mid-western private liberal art university between 2007 to 2019. The result shows that 13% are likely to persist to earn a graduate or professional degree after completing their undergraduate degree.

Keywords: post-secondary education option, dual enrollment, persistence to graduate studies, advancement opportunity, transition to higher education

1. Introduction

The Post-Secondary Enrollment Options (PSEO) is a dual enrollment program available to high school students in various parts of the United States. This program was first introduced in the late eighties to offer students the opportunity to earn college-level credits while also meeting high school graduation requirements (Brunner, Harvey, Holmberg, & Owumi, 2019; McQuillan, 2007).

Michelau's (2001) study reported that over 32 states have laws to govern the PSEO program, providing opportunities for high school students in their last two years of secondary education to earn college credits, with the benefit of taking challenging courses. In doing so, they notably reduced the cost of earning the first degree, since students are typically not required to pay for the college credits earned through the PSEO program, (2001).

According to the Minnesota Department of Education, the PSEO program is accessible to students from 10th through 12th grade (<https://education.mn.gov/MDE/dse/schfin/pseo/>) in most cases to motivate students who are advanced learners, gifted, and those with high academic grades (Fowler & Luna, 2009). Two options through the PSEO include the high school student taking college courses on a university campus or in the high school building. Therefore, PSEO participants get a head start in collegiate learning and could potentially earn credits equivalent to an Associate Degree by the time they graduate from high school (Austin-King, Lee, Little, & Nathan, 2012). The state of Minnesota is credited as the first legislated dual enrollment program in the country (Smith, et al., 2007) and reported that approximately 20% of high school students in the state of Minnesota participated in the program in 1999, which was a decade from when the program was put in place.

Research into some of the barriers to PSEO programs (Shurilla, Ebinger, Deal-Marquez, & Gutierrez, 2012; Wozniak & Palmer, 2012) reported that the two most prevalent challenges are funding and language barrier, especially for English Language Learners (ELL), more specifically for students who come to the United States in

high school. The issue of language barrier as a prevalent challenge begs two questions that are relevant but not examined in this paper, 1) since language is important to learning, but does not equate to intelligence, what could be done to mitigate the language barrier as a potential impediment to access? 2) What is the rate of first and second-generation immigrants who participate in the PSEO, and their persistence to graduate program?

By way of contrast, the program is credited for providing academic rigor, increased access for minority students, the financial advantage of a two-year paid college credit reduced financial burden overall (Shurilla, et al., 2012). Several researchers have investigated a variety of aspects of the program, including its implementation, how to strengthen the transition from high school to learning at the collegiate level, and the success rate of students who participate in the PSEO program (Hughes, & Karp, 2006, Jordan, 2001, as cited in Smith, et al., 2007). However, there is far more research necessary to inform practitioners, policymakers, and both the K-12 community as well as the higher institutions as consortiums of the PSEO program. Data on the type of career interest most prevalent among PSEO participants appears to be lacking.

The research on PSEO is growing, yet is still limited. Some studies have addressed persistent enrollment to undergraduate completion. From an assessment dimension, McQuillan's (2007) study included whether PSEO participants graduated earlier, had a higher grade point average (GPA), scored higher on the standardized test, and had a second major through the undergraduate degree works. The evidence from McQuillan's 2007 study did not support that PSEO participants had higher test scores. However, it reported that PSEO participants had higher GPAs and graduated earlier. From the same study, the data on the second major election was not significant.

Michelau (2001) reported that the PSEO increased K-12 and higher education partnerships, supported students' transition to the higher academy, and in some cases, provided college access. Yet, little is known about the participants' persistence to graduate program and career choices. Schools are providing a variety of creative options to support high school students. Some of the options presented by schools are International Baccalaureate, gifted programs, and PSEO to name a few (Brunner, et al., 2019; Kuykendall, 2020). Students in PSEO programs have been identified as students with an exceptional drive for learning (Fowler, et al. 2009). This calls into question, the rate of PSEO students' persistence to graduate school, which is the focal point of this study.

1.1 Significance of the Study

The literature review search on PSEO generated several hundred thousand articles, however, there were very limited articles on longitudinal tracking of PSEO students beyond undergraduate degree works. Students who enter graduate degree programs are much younger than half a century ago. A study on a master's in physical therapy program reported that the mean age of students in the program was 24 years as of earlier 2000 (Thieman, Weddle, & Moore, 2003). The findings from this current research have the potential to add to the body of knowledge on the outcome of PSEO students with implications to graduate programs.

1.2 Definition of Terms

Two key terms, namely the graduate programs and post-secondary education options, are defined and are consistent with the usage in this paper. A subcategory on an operational definition is also included, where the term *persistence* was defined as a way to clarify inclusionary factors such as dates and timelines, as it relates to this study.

Graduate programs are typically offered to those who have earned an undergraduate degree or undergraduate credits before graduate matriculation, for example in a master's, doctorate, or post-graduate programs, which include professional degrees such as a medical doctorate and Juris doctorate. The statistics of adults who complete a baccalaureate degree program between 2010 and 2019 in the United States is 36% (<https://www.census.gov/newsroom/press-releases/2020/educational-attainment.html>) while 21% hold a master's degree and, four percent have a terminal degree, such as a doctorate in education, based on 2018 US census.

The Post-Secondary Education Options is a program offered to students as a collaboration between secondary schools and higher institutions, which is not limited to community colleges, four-year colleges, and universities. This state-funded program across the United States (Smith, et al., 2007), allows students to take college credits while in high school, which has been found to ease the transition to higher education, while accelerating students learning, and reducing boredom among high school seniors (Fowler & Luna, 2009).

1.3 Operational Definition

Persistence to Graduate Program is based on entering the university through the PSEO, by completing an undergraduate degree and enrolling in graduate studies. This study does not account for lapses in enrollment. Since the research focus was on trends between 2007 and 2019, the students who entered the PSEO in 2007 would have graduated from high school in 2009, without a gap in enrollment, the cohorts would have completed their undergraduate studies in 2011. Therefore, the earliest time the 2007 entering cohort could have earned a graduate degree was in 2014. The research data is consistent with this information, but not the focus of this study.

2. Methods

This study is centered on the inquiry about the rate of PSEO students' persistence to graduate programs. This necessitates the use of a quantitative method, through measures of central tendency, that is, descriptive statistics and hypothesis testing. The dataset was comprised of students who participated in the PSEO program at the institution where this research took place, between 2007 and 2019, which includes those who stayed at the university or transferred to a different institution. The data analysis includes the population size, which was organized based on PSEO enrollment, those who entered a graduate program, and/or completed a graduate or professional degree program. The data was not manipulated.

2.1 Research Questions and Hypotheses

1. What is the rate of persistence for PSEO students through graduate studies?
2. Of those who participated in the PSEO program between 2007 and 2019 in the institution, what is the rate of those who have earned a graduate degree compared to those who have not?

Null Hypothesis (Ho): There is no statistically significant difference between those who have completed a graduate degree and those who have not completed a graduate degree.

Alternate Hypothesis (H1): There is a statistically significant difference between those who have completed a graduate degree and those who have not completed a graduate degree.

2.2 Population Sample and Demographics of the participants

The population of the study amounted to 2125, which includes all students who are admitted to the University for Undergraduate Studies through the PSEO program in 2007 through 2019.

The samples in this study are students who were enrolled in the PSEO program. The dataset which was provided through the Office of Institutional Research at the institution with the support of the Clearinghouse included the years of enrollment in the institution as well as outside the institution. Although retention at the institution was not the basis of this study, it is noteworthy to report that four percent of the population sampled completed their undergraduate degree at the institution. Additionally, the dataset, which was compiled in an excel spreadsheet included the name and type of institution (private/public), the enrollment status (full/half-time). The dataset also included the field of study, however, not consistently listed for every participant.

2.3 Confidentiality

This researcher removed pertinent information that could be used to identify the samples. The student identification number assigned through the institution was replaced with a generic sample ID number in a sequence. The researcher did not interrogate participants, did not engage in any form of manipulation or deception, and stored the original dataset in a password-protected folder on the computer, with a plan to delete the information after the study is completed. An Institutional Review Board form was submitted and received approval for the study.

3. Results

1) What is the rate of persistence for PSEO students through graduate studies? In addressing this research question, a statistical software program, namely Minitab, was used to calculate the proportion. The data input included the number of events, which was 285 students, and the total sample population, which was 2125 students that were enrolled through the PSEO between the 2007 and 2019 academic years.

Table 1. Descriptive Statistics

N	Event	Sample p	95% CI for p
2125	285	0.134118	(0.119905, 0.149347)

Based on the calculation of the proportion of PSEO students that persisted through the graduate studies and the total number of students enrolled, it appears that 13 percent of the sample persisted to graduate school (see table one for the result). Furthermore, the results show that using a 95 % confidence interval (CI), it is possible to predict that 11 % - 14 % of PSEO students will likely go into a graduate program, assuming this sample is representative of the entire population, and all things remain the same as the trend between 2007 and 2019. Due to the robustness of the size of the population sampled, and the analysis based on a 95 % CI, the 11-14 percent ratio is fairly reliable.

2) Of those who participated in the PSEO program between 2007 and 2019 in the institution, what is the rate of those who have earned a graduate degree compared to those who have not?

In comparing the rate of students who participated in the PSEO program between 2007 and 2019 that have earned a graduate degree (G2) and (G1), which is those who have enrolled but have not completed a graduate degree, it appears that the ratio of those enrolled in a graduate program but have not completed the degree works is significantly greater than those who have earned a graduate degree (see table 2). Additionally, the mean of the difference was calculated using a 95% CI. Noting that equal variances are not assumed for this analysis, the estimation for difference (-692, -185) resulted in -438.

Table 2. Descriptive Statistics

Sample	N	Mean	StDev	SE Mean
G1	260	775	560	35
G2	13	1214	407	113

Hypothesis Test. The null hypothesis stated was, there is no statistically significant difference between those who have completed a graduate degree (G2) and those who have not completed a graduate degree (G1).

The hypothesis test formula used is as follow: null hypothesis $H_0: \mu_1 - \mu_2 = 0$, while the alternate hypothesis $H_1: \mu_1 - \mu_2 \neq 0$. The t-value was -3.71, df 14, and the p-value = 0.002. Based on this result, the null hypothesis is rejected. Simply put, the mean of the difference between G1 (μ_1) and G2 (μ_2) is not equal to zero. Therefore, the alternate hypothesis is accepted.

4. Discussion and Recommendation for Future Research

The data analysis for question two shows that the number of those who have completed a graduate degree and participated in the PSEO program between 2007 and 2019 is disproportionate. It is important to note that those who have not completed a graduate degree are enrolled in a graduate program, and therefore, are still meeting the degree works. Consequently, a follow-up study is necessary to determine the rate of completers a few years in the future. It would also be advantageous to look for gaps in enrollment. On a tangentially related premise, there have been many studies on the impact of the COVID-19 pandemic on teaching and learning since 2020. It would be most insightful to examine the impact of the pandemic on the PSEO population.

There are several questions about PSEO yet unanswered. First, the data on immigrant students in the PSEO program is lacking. While institutions of higher education and the Clearinghouse keep track of students who enter the program, it does not account for first and second-generation immigrants as far as PSEO is concerned. There are several secondary charter schools with a significant number of students going into the PSEO program, yet, very little is known about this particular group and the rate of persistence to graduate and professional programs. This angle of research would contribute to existing bodies of knowledge.

Secondly, it would be advantageous for future researchers to examine how the PSEO program has shaped the career advancement of participants. Third, as stated earlier in this paper, the PSEO program is one of a few other advanced learning programs for students in secondary school. It would be insightful to investigate the PSEO participants compared to those in the International Baccalaureate as well as gifted and talented programs, in terms of their persistence to graduate studies. Fourth, because this study is based on PSEO initial enrollment in one institution, it would be advantageous in future research to compare the results to other available results in other institutions, which also call for a comparative study of PSEO participants in private and public institutions.

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