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# Identifying Predictors of Academic Success for Part-Time Students at Polytechnic Institutes in Malaysia

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# Identifying Predictors of Academic Success for Part-Time Students at Polytechnic Institutes in Malaysia

## **Abstract**

A central challenge for higher education today is to understand the diversity and complexity of nontraditional students' life experiences and how these factors influence their academic success. To better understand these issues, this study explored the role of demographic characteristics and employment variables in predicting the academic success of part-time students at four polytechnic institutes in Malaysia. Demographic characteristics studied included respondent's age, gender, marital status, number of children, parent's educational level, and financial resources. Employment variables assessed were number of years working, job relatedness to the program, job satisfaction, and monthly salary. A total of 614 part-time students completed the survey. Results indicated that being an older student, being female, paying for their own education, and having high job satisfaction were statistically significant predictors of part-time students' academic success. Understanding the effects of demographic characteristics and employment variables on students' academic success might help administrators and educators to develop teaching and learning processes, support services, and policies to enhance part-time students' academic success.

## **Keywords**

Academic Success, Higher Education, Malaysia, Nontraditional Students, Part-Time Students, Work Experience

## **Disciplines**

Agriculture | Bioresource and Agricultural Engineering | Engineering Education

## **Comments**

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# Identifying Predictors of Academic Success for Part-Time Students at Polytechnic Institutes in Malaysia

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## ABSTRACT

*A central challenge for higher education today is to understand the diversity and complexity of nontraditional students' life experiences and how these factors influence their academic success. To better understand these issues, this study explored the role of demographic characteristics and employment variables in predicting the academic success of part-time students at four polytechnic institutes in Malaysia. Demographic characteristics studied included respondent's age, gender, marital status, number of children, parent's educational level, and financial resources. Employment variables assessed were number of years working, job relatedness to the program, job satisfaction, and monthly salary. A total of 614 part-time students completed the survey. Results indicated that being an older student, being female, paying for their own education, and having high job satisfaction were statistically significant predictors of part-time students' academic success. Understanding the effects of demographic characteristics and employment variables on students' academic success might help administrators and educators to develop teaching and learning processes, support services, and policies to enhance part-time students' academic success.*

*Keywords:* Academic Success, Higher Education, Malaysia, Nontraditional Students, Part-Time Students, Work Experience

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## INTRODUCTION

To remain competitive in a rapidly changing economy, many adults are continuously acquir-

ing new knowledge and skills to improve their competencies in their workplace (Desjardin, Rubenson, & Milana, 2006; UNESCO, 2009). Ritt (2008) emphasized that the fastest growing jobs require a postsecondary qualification. In addition, possessing postsecondary credentials

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enables adults to gain broader economic and social benefits such as higher income over a lifetime (Brennan, Mills, Shah, & Woodley, 1999; Ritt, 2008). An increasing number of adults participating in higher education has led to greater attention focused on understanding the diversified needs of adults in higher education.

Malaysia, one of the developing countries in Asia, has placed an emphasis on providing wider opportunities for adults to continue their education in such higher education institutions as public and private universities, polytechnics, and community colleges (National Higher Education Research Institute [NHERI], 2007). In 2010, the working-age population (15–64 years) in Malaysia was expected to increase to 65.7% with the median age of 26.7 years (Bax & Hassan, 2003). Only 14% of the labor force in Malaysia, however, possess tertiary education qualifications (Bax & Hassan, 2003). This implies a need for more opportunities for adult learners to improve their education and training to meet the challenges of a knowledge-based economy.

To facilitate adults' participation, higher education institutions in Malaysia offer full-time and part-time enrollment with a broad range of e-learning instructional settings that offer learners more flexibility and greater autonomy (NHERI, 2007). Part-time enrollment seems to be the most preferred program in higher education, particularly for working adults because they can seek higher qualifications while still maintaining their jobs as well as their earnings (Chen & Carroll, 2007; Tuttle, 2005).

Polytechnic institutions are one segment in the Malaysian higher education system that provides tertiary level technical education and training. In 2000, these institutions began to offer part-time programs to adults to upgrade their academic qualifications (Bax & Hassan, 2003). These part-time programs adopt similar courses and the same assessment methods used for traditional full-time students, except that classes and practical activities in the workshop are held on weekends. The duration for the part-

time diploma program is two years, compared to one year for full-time students (Bax & Hassan, 2003). From 2000 to 2009, a dramatic increase of part-time enrollment occurred. The part-time student population grew from 171 to 2,972 students (Department of Polytechnic and Community College Education [DPCCE], 2009).

As adult learners, part-time students may have different expectations of their learning and different needs due to their maturity and the complexity of their daily lives (Graham, Donaldson, Kasworm, & Dirx, 2000; Kasworm, Polson, & Fishback, 2002). Treating them like traditional students, who enter higher education immediately after finishing high school, means that educators often neglect to take into account the influence of their diverse needs and life experiences on their academic learning and success.

The purpose of this quantitative study, therefore, was to examine whether demographic characteristics and employment variables predict academic success of students in a part-time weekend program at four Malaysian polytechnic institutes. Previous research has shown that the diversity and complexity of adult learners' life experiences have a considerable impact on their academic success in higher education (Cantwell, Archer, & Bourke, 2001; Graham et al., 2000; Rogers, 2002; UNESCO, 2009). This area remains largely unexamined, particularly in the context of the polytechnic educational system in Malaysia.

## LITERATURE REVIEW

### Definitions of Adult Learners in Postsecondary Education

Adult learners in higher education are commonly referred to by various terms such as adult students (Richardson & King, 1998), nontraditional students (Bean & Metzner, 1985; Horn & Carroll, 1996; King, 2003; Spitzer, 2000; Taniguchi & Kaufman, 2005), and mature students (Richardson, 1994, 1995; Trueman &

Hartley, 1996). Focusing on the different purposes and contexts of studies, some researchers define adult learners based on characteristics such as age, social roles, and traits (Darkenwald & Merriam, 1982; Kim, 2002; Rogers, 2002).

Age is extensively used as a definition of adult learners due to biological changes (English, 2009) and psychological development (Cranton, 1992; Rogers, 2002). Based on biological aspects, Bromley (as cited in English, 2009) stated that adulthood occurs between the ages of 16 to 20. Furthermore, Cranton (1992) concluded that an individual could be considered an adult learner between the ages of 18 to 29. Other studies, however, defined adult learners by different minimum ages such as age 16 (Kim, Hagedorn, & Williamson, 2004), age 21 (Taniguchi & Kaufman, 2005), and age 25 (Spitzer, 2000; UNESCO, 2009).

On the other hand, Darkenwald and Merriam (1982) argued that age alone is not a good indicator to describe adult learners; independence and social roles also should be used. They defined adult learners as “those who have responsibilities for managing their lives” (1982, p. 77) and who have “left the role of full-time students and assumed the role of worker, spouse, and/or parents, voter, and citizen, which denote independence characteristics of adults” (p. 8).

Horn and Carroll (1996) expanded the definition of adult learners (also referred to as nontraditional students) to include those who possess at least one of the following traits: work full-time, enroll in a part-time program, experience delayed enrollment, are financially independent, have dependents other than a spouse, are a single parent, and lack a high school diploma. These characteristics are consistent with almost 80% of the part-time students in polytechnic institutions (personal communication, December 3, 2008). Due to these similarities in characteristics, this study adopts the definition of adult learners as defined by Horn and Carroll. The term *adult learner* is also used interchangeably with *adult student* and *nontraditional student*.

## Demographic Predictors of Academic Success

Demographic characteristics of nontraditional students have been widely discussed to explain their academic performance. For example, previous researchers have examined the effect of age (Cantwell et al., 2001; Hoskins & Newstead, 1997; Kasworm, 1990; Richardson, 1995; Spitzer, 2000); gender (Cantwell et al., 2001; Hoskins & Newstead, 1997; Spitzer, 2000); family responsibilities such as marital status (Reay, 1998) and number of children (Choy, 2002; Horn & Carroll, 1996; Kember, 1999; Taniguchi & Kaufman, 2005); generation status (Bui, 2002; Education Resource Institute [ERI] & Institute for Higher Education Policy [IHEP], 1997); and financial support (Fenske, Porter, & Dubrock, 2000; McGivney, 2004) on students' academic success.

Age has been identified as being positively associated with grades at tertiary levels (Hoskins & Newstead, 1997; Kasworm, 1990; Richardson, 1994; Spitzer, 2000). Richardson (1995) found that mature students achieved slightly higher grades than nonmature students. Hoskins and Newstead (1997) indicated that age was a strong predictor of academic success for nontraditional entry students as compared to gender and type of qualifications.

In relation to gender differences, Cantwell et al. (2001) compared traditional and nontraditional students' academic achievement and found females performed better than males. Nontraditional and female students also achieved higher grades than traditional and male students (Spitzer, 2000). Nontraditional female students performed academically better than traditional female students (Carney-Crampton & Tan, 2002). Robertson (1991) revealed that female students were more likely to exhibit greater study skills including interest, motivation, and time management.

Family responsibilities, such as married life and childcare, often appear to affect adult students' academic performance, particularly

for females (Fairchild, 2003; Johnson, Schwartz, & Bower, 2000; Reay, 1998). Reay (1998) revealed, however, that married life is more supportive for females as compared to males. Furthermore, childcare concerns were often reported to be a priority over education (Fairchild, 2003). In fact, having children was found to be negatively associated with degree completion and persistence (Choy, 2002; Horn & Carroll, 1996; Kember, 1999; Taniguchi & Kaufman, 2005). Regardless of studies indicating the struggles to balance academic demands and family responsibilities (Home, 1998; Padula, 1994), nontraditional female students achieved higher grades than males (Spitzer, 2000) and traditional female students (Carney-Crampton & Tan, 2002).

Researchers have noted differences between first- and continuing-generation students in academic achievement. First-generation students are defined as students whose parents had no college education (Ishtani, 2006; National Center for Education Statistics [NCES], 1998; Terenzini, Springer, Yaeger, Pascarella, & Nora, 1996). Compared with continuing-generation students, first-generation students are more likely to have low family income with more dependents (Inman & Mayes, 1999; NCES, 1998; Terenzini et al., 1996). Thus, they are more likely to seek part-time enrollment and work full-time (NCES, 1998). These students are often associated with low achievement and being psychologically unprepared (Bui, 2002; ERI & IHEP, 1997), with less family and peer support (ERI & IHEP, 1997; Hsaio, 1992; Terenzini et al., 1996). They are also found to be at higher risk of having lower grades or not completing their studies (Ishtani, 2006; Terenzini et al., 1996).

Financial resources were one of the most often stated factors determining adults' persistence and success in higher education (Community College Survey of Student Engagement Report [CCSSE], 2008). Many students decided to further their studies through a part-time program because of financial obligations. CCSSE reported that almost 45% of the participants responded *likely* and *very likely* to the statement

that lack of finances caused them to withdraw from class or college. McGivney (2004) found those with high financial difficulties tended to have low retention or achievement. Fenske et al. (2000) found that students who paid their own tuition tended to have the lowest retention rates after the first year of enrollment, compared to those who received financial aid.

## Employment Factors

Employment is one of the main factors that differentiate part-time students from full-time students. Work experiences of part-time students are typically viewed as continually enriching and contributing to their learning process. Bourner et al. (as cited in Brennan et al., 1999) argued that part-time students could concurrently relate their work experience to their academic learning. Therefore, they could constructively apply their job knowledge and skills to their learning, or vice versa. This advantage could reinforce their academic understanding as well as enhance their academic success as suggested by Rogers (2002, p. 63):

*... the development of intelligence seems to be dependent more on the amount of educational experience one has received and on the subsequent use of learning skills in one's occupations than on any basic learning ability inherited or developed when young.*

Because most adults indicate that job-related reasons led to their participation in education (Desjardins et al., 2006; UNESCO, 2009), they should have clear career goals. Consequently, they are more prepared and motivated to learn, particularly if the program is related to their occupational field.

Furthermore, Dreher and Ryan (2000) argued the possibility of students with work experience having a better chance to succeed in their studies. Challenges and problems faced in the workplace make them able to more easily link and make connection between their academic learning and their job knowledge and skills as compared to students with no work

experience. On the other hand, Dreher and Ryan also suggested that having work experience not related to the studies may not be beneficial to students' academic achievement.

In the model of Adult Learners' College Outcome, Donaldson and Graham (1999) also emphasized the potential role of prior experiences to affect the academic outcomes of adult students. Prior experiences were defined as previous academic experiences as well as life experiences from their work, family, and other social roles. The model included prior experiences and personal biographies such as external factors that influence four other variables—psycho-social and value orientation, adult cognition, life-world environment, and connecting classroom. Consequently, three factors (adult cognition, life-world environment, and connecting classroom) directly affected the college outcome. This model clearly demonstrated that adults' prior experiences influence their classroom learning and academic success. Graham et al. (2000) tested the model and emphasized the importance of prior experiences to adult students' academic success and persistence.

## RESEARCH QUESTIONS

The importance of demographic characteristics and employment variables in predicting academic success is supported by the literature. Hence, examining the effects of these factors is pertinent to assisting adult learners in acquiring new skills, knowledge, attitudes, and behaviors that facilitate their success in higher education.

Thus, this study sought to explore the predictive power of demographic characteristics and employment variables on part-time students' academic success.

## METHODOLOGY

### Population

The study population consisted of 1,054 part-time diploma students enrolled in second- to final-semester, who enrolled for the July 2009

session (July–December) at four polytechnic institutions in Malaysia. For a diploma program, the applicant must have a polytechnic certificate with at least six months working experience. This population was selected because, by being in a part-time program, it met at least one criterion of nontraditional students defined previously. These students were also diversified in work sectors such as manufacturing, private, and civil service.

A total of 614 students (58% response rate) from five part-time programs in technical education (electrical engineering, mechanical engineering, civil engineering, information technology, and commerce) completed the questionnaire. The sample consisted of 440 (71.7%) males and 174 (28.3%) females. The respondents' ages ranged from 20 to 49 years (mean=25.5).

## Design and Procedure

This study investigated the effect of demographic characteristics and employment variables on part-time students' academic success. Quantitative data collection was employed, using survey methodologies which allowed the data to be quantified and analyzed using statistical analysis (Gliner & Morgan, 2000).

**Independent variables.** There were six demographic variables—gender, age, marital status, number of children, financial resources, and first-generation status. Gender was coded with 1 for male and 0 for female. Age was measured in years. Marital status was assessed as single, married, or divorced. Number of children was determined using four categories from no children to more than four. First-generation status was identified using parents' educational level consisting of six levels *from did not complete high school to completed a doctoral program*. Financial support was assessed using five categories: *support from parents, spouse, and relatives; loan from financial institution; loan from government; loan from employer; and employment earnings*.



Table 1. Description of variables

Variables	Description
<b>Demographic Variables</b>	Male, Female
Gender	18–24, 25–34, 35–44, 45–54, 55–64, 65 years and older
Age	Single, Married, Divorced
Marital status	No children, 1–2, 3–4, more than 4
Number of children	Financial support from parents, spouse, other relatives, not to be repaid; loans from financial institutions or government; financial assistance from your employer; earnings from employment
Types of financial resources	
Generation status	
<b>Employment Variables</b>	First-generation; Continuing-generation
Number of years working	None, 1–3; 4–6; 7–10; more than 10 years
Monthly salary	More than MYR 3000; MYR 2001 to MYR 3000;
Job satisfaction	MYR1001 to MYR 2000; MYR 1000 and below
Job relatedness to program	Rating scale of 1-4 (1=very dissatisfied, 4=very satisfied)
<b>Academic Success</b>	Related, Not related
	Student's Cumulative Grade Point Average (CGPA) extracted from official student's academic report.

The employment variables included salary information based on the response to four categories of monthly income level ranging from below *Malaysian Ringgit (MYR) 1,000 to above 3,000*; number of years working with four categories from *none to more than 10 years job designation, and job satisfaction*. Job relatedness to program was determined by comparing the job designation and program enrolled. The judgment of relatedness was based on the researcher's previous experience of teaching and managing part-time programs. For example, job designations such as technician, machinist, charginman, mechanic, fitter, and welder were labeled as job-related to the respective engineering programs. Similarly, those who worked as clerks or were involved in administrative and business work were designated in a job-related category to the commerce program.

**Dependent Variable.** Academic success was measured using the student's cumulative grade point average (CGPA) extracted from the student's official academic report. A complete listing of variables used in the study is presented in Table 1.

The questionnaire used dual languages, English and Malay, to increase clarity during

the collection of data. The translation was completed by a two native Malay speaker, who is a graduate student from Iowa State University, and a lecturer from one of the polytechnic institutions in Malaysia. Formal approval from both the Iowa State University Human Subjects Institutional Review Board (IRB) and the Director of the Department of Polytechnic and Community College Education was obtained prior to conducting this study.

Questionnaires were personally hand-delivered to each part-time student enrolled in second- to final-semester at the four selected polytechnics during 30 minutes of his/her scheduled class by this researcher or the student's academic advisor. Hand-delivered distribution was chosen to increase the response rate. Surveys were completed during the first and second weeks of the July 2009 academic session.

A letter of introduction was attached to each questionnaire to explain the purpose and the importance of this study and to assure confidentiality of the responses. The letter also noted that the participants were free to not participate and could discontinue the survey at any time. The participants were requested to write their identification numbers on the questionnaire to access their cumulative grade point averages from the official academic records. The participants were given time to read the

letter of introduction before they responded to the questionnaires. Consent was implied if the participants returned the questionnaires.

The official database of the students' academic reports was obtained from the examination unit at each polytechnic. To ensure participants' confidentiality and anonymity, the names of the students were eliminated from their academic reports.

## Data Analysis

A standard multiple regression was conducted using demographic and employment variables as predictors and academic success as the outcome variable. Analysis was performed using SPSS version 17.0. The block regression analysis was conducted on two models. Model 1 included all the demographic variables (age, gender, number of children, marital status, financial resources, and first-generation status). Model 2 added the employment variables to Model 1 (number of years working, job relatedness to the program, salary, and job satisfaction). Finally, all significant predictors in Model 2 were regressed on academic success. The equation of academic success was determined based on the final regression. The level of significance for all analyses was set at .05.

## RESULTS

From the 614 collected surveys, four respondents were excluded from the dataset because their questionnaires had more than 30% non-response variables (Tabachnick & Fidell, 2007). The remaining 610 respondents were used for the analysis. Descriptive statistics for demographic and employment predictors as well as outcome variables are presented in Tables 2 and 3. In general, most of the part-time students had work experience of less than 3 years (55.3%), were first generation students (88.2%), were single or married with no children (78.6%), were enrolled in a program related to their job (75.7%), had a salary between MYR 1000 and 2000 (71.0%), and relied on earnings from employment to support their studies (63.3%).

Therefore, the categories for demographic and employment variables used for further analysis were reduced to two or three categories as shown in Tables 2 and 3. All missing values for categorical variables were assigned to an additional category labeled as *Unknown*. The mean series procedure was used to replace missing values for continuous data.

Before performing any analysis, the continuous data were screened with the SPSS program for univariate outliers using histograms of standardized dependent variables. One extreme outlier was found in the CGPA variable and deleted. The descriptive statistics for all the variables did not show severe violation of normality. The skewness and kurtosis of all variables, except age, were within a tolerable range of  $\pm 2$  for assuming a normal distribution (Tabachnick & Fidell, 2007). Similarly, the examination of the histograms suggested that the distributions of all variables, except age, were approximately normal. Thus, it was reasonable to assume the assumption of normality is not violated for multiple regression analysis. A curvilinear relationship between age and CGPA was observed from the scatter-plot. Because of this quadratic relationship, age-squared was used for further analysis. Residual scatter-plots showed that assumptions of normality, linearity, and homoscedasticity between predicted scores and errors of predictions were met.

In the first analysis of Model 1, marital status was omitted from the model due to a high correlation with the number of children. The number of children variable was used for further analysis as it represented an increase in responsibilities for taking care of dependents better than marital status. The results of the multiple regression analysis are presented in Table 4. Results indicated Model 1 was statistically significant ( $F(7,609)=8.452, p < 0.001$ ) and accounted for .090 of total variance ( $R^2$ ) in academic success. The results indicated that age-squared ( $\beta = 2.78E-4, p = .001$ ), male ( $\beta = -.094, p = .009$ ), childless ( $\beta = .117, p = .013$ ), and financing education from other sources ( $\beta = -.102, p = .003$ ) were significant demographic predictors

Table 2. Summary of respondents' demographic characteristics (N=614)

Demographic Characteristics	Frequency	Percentage (%)
<i>Gender</i>		
Male	440	71.7
Female	174	28.3
<i>Program<sup>a</sup></i>		
Civil Engineering	190	31.0
Electrical Engineering	171	27.9
Mechanical Engineering	161	26.3
Commerce	75	12.2
Information Technology	16	2.6
<i>Age<sup>a,b</sup></i>		
18 – 24 years	319	52.2
25 – 34 years	257	42.1
35 – 44 years	31	3.3
45 – 54 years	4	.7
Mean	25.5	
Standard Deviation	3.969	
<i>Marital Status<sup>a</sup></i>		
Single	432	70.7
Married and Divorced	179	28.7
<i>Number of Children<sup>a</sup></i>		
None	480	78.6
Have children	131	21.4
<i>Financial Resources<sup>a</sup></i>		
Earnings only	386	63.3
Other sources (Parents, spouse, relatives, financial institution, or government)	198	32.5
Unknown	26	4.3
<i>Generation Status<sup>a</sup></i>		
First-generation	538	88.2
Continuing-generation	47	7.7
Unknown	25	3.9

Note: <sup>a</sup> Frequency and percentage may not equal to total N or 100% due to nonresponse to questions.

<sup>b</sup> Categories were used for descriptive purposes only.

for academic success. The first-generation variable was not significant ( $\beta = -.053, p = .387$ ). The effects of interactions were analyzed between all possible pairs of demographic characteristics. None of the interactions showed significant effects. Thus, the analysis continued with no interaction effects.

In Model 2,  $R^2$  increased to .119 ( $F(15,609) = 5.310, p < .001$ ), indicating that employment variables accounted for 2.9% of the total variance in academic success after controlling for demographic characteristics. Three employment variables—work experience more than 3 years ( $\beta = .051, p = .221$ ), job relatedness

to the program ( $\beta = .059, p = .158$ ), and salary below MYR1000 ( $\beta = -.091, p = .448$ )—were not significant employment predictors. Job satisfaction, the only employment variable, was marginally positively related to academic success ( $\beta = .050, p = .054$ ). Adding employment variables did reduce the effect of significant demographic variables (Table 4): age-squared ( $\beta = .194E-4, p = .030$ ), educational funding from other sources ( $\beta = -.084, p = .016$ ), and male ( $\beta = -.112, p = .002$ ). The childless variable was not a significant predictor ( $\beta = .083, p = .093$ ). The increase of the adjusted  $R^2$  (.096) value from Model 1 showed the addition of more

Table 3. Summary of respondents' employment and academic success variables (N=614)

Variables	Frequency	Percentage (%)
Employment		
<i>Job Satisfaction<sup>a</sup></i>		
Very dissatisfied	11	1.8
Somewhat dissatisfied	76	12.7
Somewhat satisfied	393	65.7
Very satisfied	118	19.7
<i>Monthly Basic Salary<sup>a</sup></i>		
MYR (Malaysian Ringgit) 1000 and below	61	10.3
MYR 1001 – MYR 2000	422	71.0
Above MYR 2000	86	14.5
Unknown	25	4.2
<i>Occupation<sup>a</sup></i>		
Related	463	75.8
Not related	116	19.2
Unknown	32	5.2
Academic Success		
<i>Cumulative Grade Point Average (CGPA)<sup>a,b</sup></i>		
3.75 – 4.00 (mostly A's)	31	5.1
3.25 – 3.74 (about half A's and half B's)	220	36.0
2.75 – 3.24 (mostly B's)	258	42.4
2.25 – 2.74 (about half B's and half C's)	89	14.6
1.75 – 2.24 (mostly C's)	9	1.5
1.25 – 1.74 (about half C's and half D's)	1	2.0
Less than 1.25 (mostly D's or below)	1	2.0
Mean	3.13	
Standard deviation	0.43	

Note: <sup>a</sup>categories were used for descriptive purposes only.

<sup>b</sup>Frequency and percentage may not equal to total N or 100% due to non-response to questions.

variables improved the prediction model. The interaction effects among demographic characteristics and employment variables indicated no significant effects. Therefore, the overall model only measured the main effects.

The equation for the overall model that includes all significant predictors was:

$$CGPA = 2.782 - .095\text{Male} + 3.74\text{E-}4\text{Age-squared} - .100\text{Financial from other sources} + .066\text{Job satisfaction}$$

This equation implied that with each additional year of age-squared, 3.74E-4 unit cumulative grade point average would increase up to a certain age-point and then decrease. On average, males have a CGPA about .095 points lower than females, after controlling for other

variables in the model. After controlling all other variables, on average students who rely solely on their earnings to support their education have a CGPA of .100 units higher than those with other sources of financial resources. After controlling all other variables, the increase of each unit of job satisfaction would increase .066 unit of CGPA. In the overall model,  $R^2$  was .087 ( $F(5,609)=11.60, p<0.001$ ) for the variation in academic success of part-time students.

## DISCUSSION

This study demonstrated the importance of demographic characteristics and employment variables for understanding part-time students' academic success in Malaysian polytechnic

Table 4. Academic success (CGPA) regressed on demographic and employment variables (N=609)

Variables	Model 1		Model 2	
	B	Std error	B	Std error
<i>Age-squared</i>	2.78E-4***	8.137E-5	1.94E-4*	8.893E-5
<i>Gender</i> (Male = 1)	-.094**	.036	-.112**	.036
<i>Number of Child</i> (None = 1)	.117**	.047	.083	.050
<i>Financial Resources</i>				
Other Sources	-.102**	.035	-.084*	.035
Unknown	-.143	.111	-.103	.115
Earnings	0 <sup>a</sup>		0 <sup>a</sup>	
<i>Generation Status</i>				
First-generation	.053	.061	.035	.061
Unknown	.156	.122	.182	.126
Continuing-generation	0 <sup>a</sup>		0 <sup>a</sup>	
<i>Job Satisfaction</i>			.050	.026
<i>Number of years working</i>				
More than 3 years			.051	.042
Unknown			-.057	.140
3 years and below			0 <sup>a</sup>	
<i>Job relatedness to program</i>				
Related			.059	.042
Unknown			-.008	.082
Not related			0 <sup>a</sup>	
<i>Salary</i>				
Below RM1000			-.091	.120
RM 1000-2000			.030	.112
Above RM2000			.063	.118
Unknown			0 <sup>a</sup>	
Intercept	2.977***		2.822***	
R <sup>2</sup>	.090***		.119***	
Adjusted R <sup>2</sup>	.079		.096	
F	8.452		5.310	
df	7		15	

Note: \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ ; a = reference group

institutes. Demographic characteristics ( $R^2 = .09$ ) were determined table more reliable predictors of part-time students' academic success as compared to variables of employment ( $R^2 = .029$ ). Four demographic variables—age, gender, number of children, and financial resources—demonstrated significant relationships on students' CGPAs. Specifically, students who were older, female, childless, and financed their own education were more likely to score higher grades.

Age played a significantly positive role in predicting students' academic success. This finding supports previous studies conducted by Hoskins and Newstead (1997), Kasworm (1990), Richardson (1994), and Spitzer (2000). Other researchers argued older students were committed to their studies because they exhibited greater learning goals (Grimes, 1995), self-regulation, and intrinsic motivation (Spitzer, 2000). Presumably older students possess characteristics such as independence more towards

problem-centeredness and internal motivation, which is consistent with the self-directed learning concept introduced by Knowles (1980).

Consistent with the findings of previous studies, females were determined to have significantly higher CGPA than males (Cantwell et al., 2001; Carney-Crampton & Tan, 2000; Spitzer, 2000). Perhaps, the greater self-regulation for females in this technology field explained their higher achievement in academics. In contrast with Fairchild (2003) and Johnson et al.'s (2000) studies, family responsibilities appeared not to affect females' academic achievement.

Students with no children were discovered to have the strongest significant association with academic success. These findings demonstrated the likelihood that caring for dependents limited students' time for studying and affected their academic success. This finding is in agreement with previous studies (Choy, 2002; Horn & Carroll, 1996; Kember, 1999; Taniguchi & Kaufman, 2005).

Financial sources appeared to influence students' academic success. In contrast with Fenske et al.'s (2000) study related to retention rates among adult learners, this study showed that students who financed their education from their earnings tended to have higher grades than those who received financial support from other sources, such as relatives, employers, or loans. It is likely that students who financed their own education were more committed in their studies.

This study suggested that, in general, work experience had significant predictability of students' academic success. This finding indicated that the overall employment variables (number of years working, job relatedness to the enrolled program, job satisfaction, and monthly salary) contributed significantly ( $R^2 = .029$ ) to students' academic success. Individual employment variables, however, were not significant except job satisfaction. Hence, the relationship between work experiences and academic success is complicated and requires further research.

One plausible explanation for this significance predictability of overall employment predictors are job-related reasons that could be students' main motives to enter higher educa-

tion. This assumption was made for two reasons: (a) the sample age ranged from 20 to 49, which falls within ages career-oriented learners as found by Morstain and Smart (1977) and (b) the higher percentage of participants was enrolled in programs related to their occupational field. Job satisfaction was determined to be marginally significant predictor of students' academic success. Perhaps students who were more satisfied with their jobs tended to apply their job's knowledge in their academic learning and were more engaged in their studies.

Adding employment variables to the demographic characteristics reduced the effects of demographic variables and their significant predictability of students' academic performance. This result indicates the potential of significant interactions among employment and demographic variables, which require further investigation.

This research contributes to a better understanding of the effects of the selected demographic and employment variables on part-time students' academic success in Malaysian polytechnic institutes. UNESCO (2009) also supported that each country needs to understand its own characteristics of adult learners to address their needs in developing appropriate policies and programs. The overall factors explained a considerable amount of the variation in students' academic achievement, even though only four variables had significant predictability. These findings provide valuable information to administrators and educators of part-time students to develop policies, teaching and learning processes, and support services to enhance students' performances in their studies. For instance, in the effort to improve students' performances, educators and administrators may design effective motivation programs for younger students, males, and those who receive other types of support to finance their education. Furthermore, these findings indicate females perform better than males academically. This finding may be used to recruit more females to enroll in part-time programs. In addition, providing a support system such as childcare

may also assist to improve students' academic success.

With the obvious limitation of examining only the direct effects of demographic characteristics and employment variables on students' academic success, this study suggests further investigation of the relationships between these factors and how they affect students' academic success. Investigating these relationships could explain what drives them to become successful based on their demographic and employment information.

Another extension for future research might be to include other potential predictors of academic success, such as previous academic achievement, learning approach, and students' motivation to fully explore the relationships among demographic, employment, and part-time students' academic success. In addition, a more comprehensive assessment of employment variables, such as attitudinal aspects related to how students perceived the influence of their work experiences on their academic learning, would be beneficial. Furthermore, conducting this same study with a broader group of part-time students could enhance the generalization of the findings in the Malaysian context and allow researchers to investigate potential differences due to academic discipline among these part-time students.

In conclusion, providing wider access for adult learners in higher education may not ensure their success in academia. To help them succeed in their academic pursuits, administrators and educators could use this study's findings to effectively develop intervention programs, policies, and teaching and learning processes that suit students.

## CONCLUSION

The following conclusions are based upon the findings of this study:

- Demographic characteristics and employment variables were significant in predicting part-time students' academic success at polytechnic institutions in Malaysia.
- Demographic characteristics—gender, age-squared, number of children, and financial support—were determined significant predictors of students' academic success.
- After controlling demographic characteristics and other employment variables, job satisfaction exhibited significant predictability of students' academic achievement.
- Gender, age-squared, financial support, and job satisfaction were significant predictors in the overall model that included demographic characteristics and employment variables.

## Recommendations for Future Research and for Administrators

Based on this study's discussions and conclusions, the following recommendations are generated:

- Examine the relationships among demographic characteristics and employment variables to better understand how these factors affect students' academic success.
- Include other potential predictors of academic success, such as learning approach and students' motivations, to fully explore the relationships among demographic, employment, and students' academic success.
- Develop a more comprehensive assessment of employment variables, such as attitudinal aspects related to how students perceive the influence of their work experiences on their academic learning.
- Conduct this same study with a broader group of part-time students in higher education in Malaysia to enhance the generalization of the findings in a Malaysian context and investigate potential differences due

to academic discipline among these part-time students.

- Develop effective intervention programs, policies, and teaching and learning processes based on students' gender, age, financial resources, and job satisfaction. For instance, a motivational program for younger and male students could improve their academic achievement.

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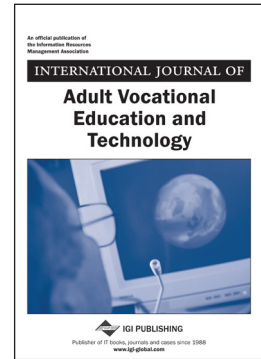
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