Factors Affecting The Interest Of Prospective Students In Choosing The D3- Electronics Engineering Program

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Abstract. The development of the electronics engineering study program has experienced rapid progress in various aspects, such as microelectronics and semiconductor technology, renewable energy technology, smart grid, Internet of Things (IoT), communication networks, automation and robotics, and artificial intelligence (AI). However, at Polbeng, prospective students' interest in choosing this study program is quite concerning. Using a survey method conducted on high school students specializing in electrical engineering in the Riau Province with a sample of 125 respondents, questionnaires were distributed online, and the data were analyzed using quantitative techniques with multiple linear regression. The results show that out of the four factors suspected to influence interest in choosing, namely: motivation $(X1)$; talent $(X2)$; family $(X3)$; and society $(X4)$, only two factors significantly influence, which are the factors of motivation and talent. Motivation is influenced by career prospects, campus image, choices, promotions/socialization, and the proximity of the campus to their residence. Meanwhile, talent is determined by academic performance, skills possessed, creativity in innovation, satisfaction in the chosen department, and independence factor. These two factors proved to be the most dominant in influencing the choice of study program.

Keywords: Interest in Choosing D3 Electrical Engineering; Motivation; Talent; Family; Society.

INTRODUCTION

The Industrial Revolution 4.0 is currently advancing rapidly alongside the development of electronic technology. This revolution encompasses aspects such as industrial automation, robotics, the Internet of Things (IoT), microcontrollers, semiconductors, artificial intelligence (AI), renewable energy, and electric vehicles. These advancements are making life easier and are expected to boost economic growth across various sectors. One of the conveniences we experience today is the ease of accessing information and finding or purchasing desired products using just a smart phone.

The ease of technology and the current industrial revolution do not correspond with the level of interest among prospective students in the D-III Electronic Engineering study program at State Polytechnic Bengkalis. The interest level of prospective students in this program has been classified as low. Over the past three years, the program has only had one class for each cohort. The number of students enrolling in the D-III Electronic Engineering program was 26 in 2022, 20 in 2023, and 27 in 2024. As a result, each cohort has only had one class. Therefore, research was conducted on the factors influencing the interest of prospective students in choosing the D-III Electronics Engineering program at State Polytechnic Bengkalis.

This research was conducted using an online survey questionnaire targeting all prospective students in the vicinity of State Polytechnic Bengkalis, specifically those with fields similar to the D-III Electronics Engineering

study program. The prospective students for the D-III Electronics Engineering program at State Polytechnic Bengkalis are students from vocational high schools (SMK) that offer study programs in Electronics Engineering, Industrial Electronics Engineering, Mechatronic Engineering, Audio Video Engineering, and Industrial Automation Engineering.

The development of education is rapidly advancing in the modern era, which demands competent human resources to drive progress in various sectors of life. The rapid advancement in education is closely linked to technological developments that keep pace with it. The educational programs available in Indonesia consist of several types, such as SMA (Senior High School), SMK (Vocational High School), MA (Islamic Senior High School), and equivalent institutions. One of the educational programs that is currently developing is SMK (Vocational High School). Vocational education is designed to prepare students to work in specific fields (UUSPN 2, 1989).

Vocational education is education at the secondary level that emphasizes the development of students' abilities to perform specific types of work (PP 29 year 1990 article 1 paragraph 3). This aligns with the 1945 Constitution and the National Education System Law (UUSPN) No. 20 of 2003, which states that education is a conscious and planned effort to create a conducive learning atmosphere and process so that students can actively develop their potential to possess spiritual strength, self-control, personality, intelligence, noble character, and the skills needed for themselves, society, the nation, and the state.

The government has made various efforts to provide the best education for the nation's children and develop several higher education institutions. Higher education institutions, according to M. Enoch (2007: 19), encompass diploma, undergraduate, master's, specialist, and doctoral programs conducted by universities (Rohman 2009: 225). Thus, if students continue their studies at higher education institutions, they will acquire competencies relevant to the study program chosen and work in their fields of expertise.

In developing students' education, it is essential for them to continue to the next level of education. However, the question remains: are students interested in pursuing further studies at higher education institutions?

According to Sardiman (2011: 76), interest does not arise suddenly or spontaneously; instead, it emerges from participation, experience, and habits during learning and working.

Based on the case studies examined by the researchers, several general factors influencing prospective students' interest in choosing a study program have been identified:
a. Parents' Socioeconomic Status [1]. According to the above case study, parents' socioeconomic status affects students' interest in continuing to higher education. For parents who are financially capable of sending their children to higher education, it automatically elevates their social status within the community.[1]
b. Self-Motivation of Students [2]. According to the case study by Soli et al., intrinsic motivation significantly influences students' interest in pursuing higher education. This is because continuing studies at the university level is viewed as a crucial step toward achieving their dream job.[2]
c. Students' Academic Achievement (Idawati, et al : 2018)Students' academic performance affects their interest in continuing to higher education. The case study by Mohija (2019:26) states that students who receive high grades in certain subjects or fields (such as Science or Social Studies) tend to pursue higher education in the same area.[3]
d. Peer Influence [4] Peer influence is another factor supporting students in continuing their education at the university level. In the case study, Zahra explains the concept of "imitating" behavior, where students with unstable attitudes are more easily influenced by their peers. [4]

Research studies related to interest in choosing educational fields can be seen in the following studies:
1. Research conducted [5], "The Influence of Parents' Socioeconomic Status and Learning Motivation on Interest in Continuing Studies to Higher Education (A Study on Students of SMK Nasional Padang)." Eco Gen Journal, 1(1), pp. 140-152.[5]
2. Research conducted by Soli [5], "The Influence of Self-Potential, School Environment, and Parents' Education Level on Students' Interest in Continuing Studies to Higher Education at MAN 1 Banyumas." Soedirman Economics Education Journal, 12(4), pp. 45-57.[6]

3. Research conducted [7]. "The Influence of Socioeconomic Status and Peer Environment on Students' Interest in Continuing Studies to Higher Education." Thesis: Faculty of Education, Universitas Negeri Surabaya.
4. Research conducted [8], "Identification of Factors Affecting Students in the Process of Selecting Further Education Majors (A Study on 11th Grade Students of SMA Negeri 5 Banda Aceh)." Indonesian Education Research Journal, 4(1), pp. 78-84.
5. Research conducted [9] "Factors Affecting Students' Interest in Enrolling in Vocational Schools with Industrial Electronics Expertise Program in Kulon Progo Regency." Journal of Electrical Engineering Education, 7(5), pp. 376-384.[9]

It is suspected that the interest of prospective students in choosing the D-III Electronics program is influenced by internal factors (interest/motivation and talent) and external factors (family/promotion and community/career prospects.

METHODS

The research method focuses on the factors influencing students' interest in the D-III Electronics Engineering program, consisting of three main stages:

First, data collection; second, data processing; and third, data analysis. The data collection involves interviews and the distribution of questionnaires directly to the research subjects. The sampling method used in this study is random sampling, with a total of 125 respondents. Data collection techniques include questionnaires, interviews, and documentation.

Second, involves processing the questionnaire data obtained during the survey. The survey, conducted online using Google Forms, is converted to a Likert scale. The Likert scale applied assigns numerical values to the responses: Strongly Agree (SS) is assigned a score of 5, Agree (S) a score of 4, Neutral (CS) a score of 3, Disagree (TS) a score of 2, and Strongly Disagree (STS) a score of 1.

Third, involves data analysis, which aims to assess prospective students' interest in the D-III Electronics Engineering program and identify the factors influencing their choice. Descriptive percentage analysis is used for this purpose.

Moreover, the research is conducted among prospective students (12th-grade students) from vocational schools (SMK) around State Polytechnic Bengkalis, specifically in Riau Province, which offers programs in Electronics Engineering, Industrial Electronics Engineering, Industrial Automation Engineering, Audio Video Engineering, and Mechatronics Engineering. The research flow is illustrated in FIGURE 1 below.
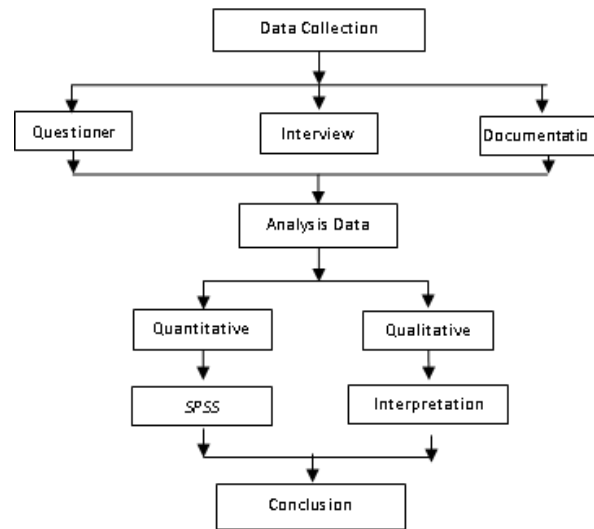
FIGURE 1. Research Flow Model

The data collection technique is conducted using instruments in the form of questionnaires and interviews. The obtained data will undergo several analysis stages. In this stage, the data collected (involvement and responses from students) will be analyzed quantitatively and qualitatively based on the scores from the completed student involvement questionnaires and the results of the interviews.

The data analysis is performed using multiple linear regression, where the dependent variable is the interest of prospective students (Y), while there are four independent variables: Motivation for Choosing (X1), Talent (X2), Family (X3), and Community (X4). To ensure that the research questionnaire has consistency and appropriateness, validity and reliability tests are conducted. The normality test is used to ensure that the data is suitable for parametric statistics (multiple linear regression).

To test whether the independent variables partially affect the dependent variable, a t-test is used. Meanwhile, to test simultaneously, an F-test is conducted. To measure the magnitude of the influence between variables and the contribution of independent variables to the dependent variable, regression coefficients and the coefficient of determination are utilized.

The population in this study consists of prospecti ve D-III Electronics Engineering students, specifically high school students from vocational schools (SMK) that have programs related to Electronics Engineering, such as Industrial Electronics Engineering, Industrial Automation Engineering, Mechatronics Engineering, and Audio Video Engineering, both private and public, spread across Riau Province. Since the exact population size is unknown, the technique suggested is to use a sample size that is at least five times the number of indicator variables (Ferdinand, 2014). Given that the indicators for the five variables total 25 indicators, the sample size taken is 125 people, using proportional random sampling based on schools (SMK), including: SMKN 2 Dumai, SMKN 2 Pekanbaru, SMKN 1 Mempura, SMKN 5 Dumai, and SMK YPPI Perawang.

To facilitate the data collection process, the definition and operationalization of the variables are presented in **TABLE 1** below

TABLE 1. Definition and Operationalization of Variable

Variable	Indicator	Scale
Interest of prospective students calon mahasiswa (Y)	1. Active Involvement 2. Academic Preference 3. Consistency 4. Selection 5. Verbal Expression	Ordinal

Motivation for choosing (X1)	1. Career Prospective 2. Brand Image 3. Selection 4. Promotion/Socialization 5. Distance of the Location	Ordinal
Talent (X2)	1. Academic Achievement 2. Skilled 3. Creative and Inovative 4. Satisfaction 5. Independence	Ordinal
Parents (X3)	1. Financial support 2. Parental Decision 3. Parental Expectation 4. Parental Insight 5. Family Relation 6. Relasi Keluarga	Ordinal
Society (X4)	1. Social Support 2. Trend 3. Industry Development 4. Government Support 5. Working World	Ordinal

RESULTS AND DISCUSSION

The ordinal data collected from 125 respondents was first analyzed for validity and reliability, followed by a normality test. Of the 25 statements used in this study, the product-moment correlation values were greater than 0.300. This demonstrates that all statement items fall into the valid category. Next, the Cronbach's alpha value was greater than 0.600, indicating that the five variables used are reliable. Additionally, the data distribution based on the scatter plot shows that the data is closely aligned with the diagonal line, confirming that the data is normally distributed.

Subsequently, based on the multiple linear regression analysis, as shown in the table below, Table 2 presents the coefficients and t-test, illustrating the significance of the influence of the independent variables and the magnitude of their effect on the dependent variable as follows.

TABLE 2. Coefficients and t-test

Coefficients [a]					
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	.080	1.190		.067	.947
	Motivasi Memilih	.704	.089	.652	7.874	.000
	Bakat	.221	.081	.207	2.725	.007
	Keluarga	.206	.087	.180	2.357	.020
	Masyarakat	-.168	.082	-.149	-2.053	.042
a. Dependent Variable: Talent						

From **TABLE 2** above, it can be seen that the constant value is 0.080, which means that the interest level of prospective students in choosing the D-III Electronics Engineering program is 0.080 when the values of the variables of motivation, talent, family, and community are all equal to zero.

First, the regression coefficient for the motivation variable is 0.704, indicating that the motivation variable has a positive influence. This means that the better the motivation of prospective students, the greater their interest in choosing the program. The impact of 0.704 means that if motivation increases by one unit, the interest of prospective students will increase by 0.704 units. The calculated t-value is 7.874 with a significance level of 0.000, which is less than 0.05. This indicates that the motivation variable significantly influences the interest of prospective students in choosing the D-III Electronics Engineering program at State Polytechnic Bengkalis.

Second, the regression coefficient for the talent variable is 0.221, indicating that the talent variable has a positive influence. This means that the better the talent of prospective students, the greater their interest in choosing the program. The impact of 0.221 means that if talent increases by one unit, the interest of prospective students will increase by 0.221 units. The calculated t-value is 2.725 with a significance level of 0.007, which is less than 0.05. This indicates that the talent variable significantly influences the interest of prospective students in choosing the D-III Electronics Engineering program at State Polytechnic Bengkalis.

Next, the regression coefficient for the family variable is 0.206, indicating that the family variable has a positive influence. This means that the better the family conditions of prospective students, the greater their interest in choosing the program. The impact of 0.206 means that if family conditions increase by one unit, the interest of prospective students will increase by 0.206 units. The calculated t-value is 2.357 with a significance level of 0.020, which is less than 0.05. This indicates that the family variable significantly influences the interest of prospective students in choosing the D-III Electronics Engineering program at State Polytechnic Bengkalis.

Finally, the regression coefficient for the community variable is -0.168, indicating that the community variable has a negative influence. This means that the better the community's understanding of the D-III Electronics Engineering program, the lower the interest of prospective students in choosing it. The impact of -0.168 means that if community conditions increase by one unit, the interest of prospective students will decrease by 0.168 units. The calculated t-value is -2.053 with a significance level of 0.042, which is less than 0.05. This indicates that the community condition variable significantly influences the interest of prospective students in choosing the D-III Electronics Engineering program at State Polytechnic Bengkalis.

Furthermore, the F-test is conducted to simultaneously examine the influence of motivation, talent, family, and community on prospective students' interest in choosing the D-III Electronics Engineering program, as shown in **TABLE 3** below.

TABLE 3. F-Test.

Model		Sum of Squares	df	Mean Square	F	Sig.
Analysis of Variance /ANOVA[a]						
1	Regression	1566.306	4	391.577	81.735	.000[b]
	Residual	574.894	120	4.791		
	Total	2141.200	124			
a. Dependent Variable: Interest						
b. Predictors: (Constant), Career Prospect, Promotion, Talent, Motivation						

From **TABLE 3** above, it can be seen that the F-statistic value is 81.735, with a significance value of 0.000, which is less than 0.05. This demonstrates that, collectively, the variables of motivation, talent, family, and community have a significant influence on prospective students' interest in choosing the D-III Electronics Engineering program.

Meanwhile, the magnitude of the influence of motivation, talent, family, and community on prospective students' interest in selecting the program can be seen in **TABLE 4** below.

TABLE 4.Coefficient of Determination (R2)

Model Summary [b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.855[a]	.732	.723	2.18879	1.768

a. Predictors: (Constant), Career Prospects, Promotion, Talent, Motivation
b. Dependent Variable: Interest

From **TABLE 4** above, it can be seen that the R-squared value is 0.732, which means that the influence of motivation, talent, family, and community on prospective students' interest in choosing the D-III Electronics Engineering program is 73.2%. Meanwhile, the remaining 26.8% is influenced by other factors

CONCLUSIONS

Based on the data analysis using SPSS, the research conclusions on the factors influencing prospective students' interest in choosing the D-III Electronics Engineering program are as follows:
1. The factors influencing prospective students' interest are 72.3% determined by motivation, talent, family, and career prospects.
2. Three factors—motivation, talent, and family—have a positive and significant influence.
3. One factor—career prospects—has a negative and significant influence.
4. Simultaneously, the factors of motivation, talent, and family have a significant influence

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REFERENCES

[1] I. A. Musyafi, "Pengaruh Status Sosial Ekonomi Orang Tua Terhadap Orientasi Masa Depan Pendidikan Siswa," *Skripsi UIN Syarief Hidayatullah Jakarta*, pp. 1–152, 2018.
[2] M. Alfarizi, R. Nurul, and A. Wulandari, "Pengaruh Status Perekonomian Orang Tua, Efikasi Diri, dan Motivasi Belajar Terhadap Minat Melanjutkan Pendidikan ke Perguruan Tinggi pada Siswa OTKP di SMKN 10 Surabaya," *J. Pendidik. Tambusai*, vol. 6, no. 1, pp. 3638–3648, 2022.
[3] J. P. Widodo and A. F. A. A, "PENGARUH PROGRAM PEMINATAN PEMINATAN MA DARUL FALAH CUKIR JOMBANG TAHUN PELAJARAN 2017 / 2018," 2018.
[4] 4W. S. Kristiono, "Peran Kelompok Teman Sebaya dalam Menentukan Pengambilan Keputusan Karir Pada Siswa Kelas XI di SMK Negeri 7 Yogyakarta," *J. Ris. Mhs. Bimbing. dan Konseling*, vol. 4, no. 10, pp. 604–614, 2018.
[5] R. Ramadhan, M. Usman, and A. Armiati, "Pengaruh Status Sosial Ekonomi Orang Tua Dan Motivasi Belajar Terhadap Minat Melanjutkan Studi Ke Perguruan Tinggi (Studi Pada Siswa Smk Nasional Padang)," *J. Ecogen*, vol. 1, no. 4, p. 140, 2018, doi: 10.24036/jmpe.v1i1.4733.
[6] S. Solihat, T. Nurfitri, and A. T. Nawarini, "Pengaruh Potensi Diri, Lingkungan Sekolah Dan Tingkat Pendidikan Orang Tua Terhadap Minat Siswa Melanjutkan Studi Ke Perguruan Tinggi Di Man 1 Banyumas," *Soedirman Econ. Educ. J.*, vol. 2, no. 2, p. 45, 2020, doi: 10.32424/seej.v2i2.3001.
[7] I. Darmawan, "Pengaruh Status Sosial Ekonomi Dan Lingkungan Teman Sebaya Terhadap Minat Melanjutkan Studi Ke Perguruan Tinggi Pada Siswa," J. Pendidik. dan Ekon., vol. 6, no. 2, pp. 156–165,

2017, [Online]. Available: http://journal.student.uny.ac.id/ojs/ojs/index.php/ekonomi/article/view/6090/5816

[8] Z. Nelissa, S. Astuti, and M. Martunis, "Identifikasi Faktor yang Mempengaruhi Siswa dalam Proses Pemilihan Jurusan Pendidikan Lanjutan (Studi pada Siswa Kelas XI SMA Negeri 5 Banda Aceh)," *JPPI (Jurnal Penelit. Pendidik. Indones.*, vol. 4, no. 1, pp. 78–83, 2018, doi: 10.29210/02018198.

[9] P. Wibowo and K. Ima Ismara, "Faktor-Faktor Yang Mempengaruhi Minat Siswa Memilih Masuk Ke Sekolah Menengah Kejuruan Program Keahlian Elektronika Industri Di Kabupaten Kulon Progo Factors That Influence Student Interest in Choosing Vocational High School Majoring in Industry Electroni," *Prodi Pendidik. Tek. Elektro*, vol. 7, no. 5, pp. 376–384, 2017, [Online]. Available: http://journal.student.uny.ac.id/ojs/index.php/elektro