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Selection of New Study Programs Based on Prospective Students' Expectations and University Considerations Using AHP Approach

Seleksi Program Studi Baru Berdasarkan Perspektif Harapan Siswa dan Konsiderasi Universitas Menggunakan Teknik AHP

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ABSTRACT
Education is one of the important factors that need to be considered in improving the quality of human resources. Management of formal education is an important key in maximizing the potential of human resources. One of the educational institutions that play a huge role in increasing this potential in Higher Education Institutions. Parts of the efforts made in an effort to improve the quality of higher education is to provide a platform for students to choose to in higher education. This research seeks to explore and analyze the study interests of prospective students in Surabaya. By using the Analytical Hierarchy Process (AHP) to describe the needs of study programs according to market needs and interests, this article seeks to show from a scientific point of view how students are interested in entering study programs in this era. This provides opportunities for universities to consider opening new study programs in the future.
Keywords : *Higher education feasibility study, Multi-criteria decision-making, AHP*

1. Introduction

Indonesia as a developing nation has a big vision, namely Indonesia will be golden in 2045. The period 2010 – 2035, is a period in which Indonesia has great human resource potential, where at this time the majority of the population in Indonesia is at productive age. This situation demands good management of human resources, starting from the aspect of education to the world of work and industry (Hasudungan and Kurniawan, 2018). This is shown in one of the four pillars of Indonesia's 2045 vision, which reads: 'human development and mastery of science and technology.' This vision is seen to be realized when education, health and productivity factors can be met.

Education is one of the critical factors that need to be considered to realize an increase in the quality of human resources. Education has two orientations: community orientation and individual orientation (Rezky et al, 2019). Personal orientation is related to the development of self-potential which will assist in understanding oneself and the environment, as well as increasing adaptive and anticipatory orientation. Community orientation is related to the role of education as a conservative agent, innovative agent, and agent of change (Rezky et al, 2019). Education is a vital component in the management of a country's human resources. The role of education is irreplaceable, therefore it needs to be well-prepared.

Education can be held formally or non-formally. In addition to education in the family which is the initial foundation of human formation, formal education also needs to be adequately implemented. Management of formal education is an important key to maximizing the potential of existing human resources. One of the educational institutions that play a role in increasing the potential of human resources, improving community welfare, and fulfilling stakeholder requests is Higher Education. An era that is synonymous with very rapid change (volatility), uncertainty (uncertainty), diversity (complexity), and ambiguity (ambiguity) or what

is known as VUCA, challenges Higher Education to be able to produce qualified graduates. and according to market needs.

The modern world of work demands a lot of new skills to support global competition. One way to get expertise that is in accordance with market needs is to carry out higher education in accordance with the field of study that is of interest. In the city of Surabaya, based on data, there are at least 110 tertiary institutions, consisting of 71 private universities, 6 state universities, 25 religious universities, and 8 particular higher education institutions. Of the many tertiary institutions in the city of Surabaya, there is still a need for a lot of development of scientific domains, to support many prospective students in the future. One way that can be taken to develop this is by opening a new study program, which is in accordance with market needs and interests.

The opening of a new study program cannot be done haphazardly. A comprehensive and in-depth study is needed so that the study program that will be opened can truly answer the needs of the world of work in the future as well as meet market demand. This is what prompted the feasibility analysis of study programs at Darma Cendika Catholic University. Many feasibility studies for opening study programs have been carried out, but the discussion only narrowed down to one study program (Dhartikasari, 2020). The research base of many study programs is concentrated in one study program (Masykuroh et al., 2019; and has not spread to many study programs (Dhartikasari, 2020). In fact, students may have their own priorities in determining the desired study program for further studies. Therefore, this research will use a method that hopes to know the priority needs and interests of the study program to be established based on market interest.

Feasibility studies can be understood as the first step used in decision-making for business development (Heriyanto and Suntoro, 2017). Kasmir and Jakfar (2012: 7) convey that a business feasibility study is a form of activity to study thoroughly a business or business to be run, the expected feasibility is the possibility of a company or business idea to be implemented to provide benefits, both socially and financially (Ibrahim, 2003: 1). The primary purpose of a feasibility study is to increase the readiness of an organisation to succeed before activities, businesses, and support are implemented (Novom, 2007:19). Umar (2009: 24-29) states that important aspects in feasibility studies include market, marketing, technical and technological, human resources, management, financial, social, political, economic, industrial environment, juridical, and environmental aspects.

Feasibility studies in education are useful for making decisions related to improving educational services, in this case, a study programme that is feasible to open. The studies in feasibility study must fulfil 5 criteria, namely:

a. There are real job prospects for graduates of the study programme so that it will not cause new unemployment;
b. The opening of a new study programme does not result in an additional burden on the government and the main mission of Higher Education can still be handled properly;
c. The opening of new study programmes must still consider the state of study programmes in other universities, so as not to cause unhealthy competition.
d. The opening of new study programmes is in accordance with the demand from stakeholders related to the expertise of the Human Resources needed;

The opening of a new study programme does not cause internal problems in the university.

2. Literature Review

Feasibility Study

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Feasibility studies in the field of education are useful for making decisions related to improving educational services, in this case a study program that is feasible to open. The studies in the feasibility study must meet 5 criteria, namely:

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4. The opening of new study programs is in accordance with requests from stakeholders related to the expertise of the Human Resources needed;
5. The opening of a new study program does not cause internal problems of Higher Education.

Positioning

Positioning can be understood as actions or steps from producers to design the image of the company and value offerings, so that consumers understand and appreciate what the company is doing compared to its competitors. Positioning cannot rule out existing competitors. If it is associated with the positioning of Higher Education, it can be explained that to maintain its existence, Higher Education must be able to offer a product, in this case a study program that is different from its competitors (Marginson, 2004). The position of a study program can be said to be good when the institution can provide a degree that offers an increase in social status and lifelong employment opportunities in the eyes of students, parents, or users (Hirsch, 1976).

Community Expectations

Rasbin (2013: 13) states that expectations are expectations about the future based on all the information available to them, such as market information, government policies, international developments, and others. Based on the opinions that have been conveyed, it can be said that expectations consist of 2 components (Hasmy, 2019), namely:

1. Expectations related to the future, which can be interpreted that someone 'hopes' that something that has never happened will happen according to what is desired;
2. Made based on various information obtained, which can be said that expectations are based on information such as: market information, government policies, and developments in situations and conditions.

Expectations can be divided into 3, namely static expectations, adaptive expectations, and rational expectations. Related to the design of a policy, the commonly used expectation is rational expectation (Rasbin, 2013: 13). Rational expectations can be understood as expectations related to the future as a result of a combination of static expectations that are idealistic, and adaptive expectations that are more pragmatic (Hasmy, 2019). Related to the education expected by a person, it is often associated with the work expected by that person. Therefore, the selection of study programs cannot be separated from market needs and the work desired by a person.

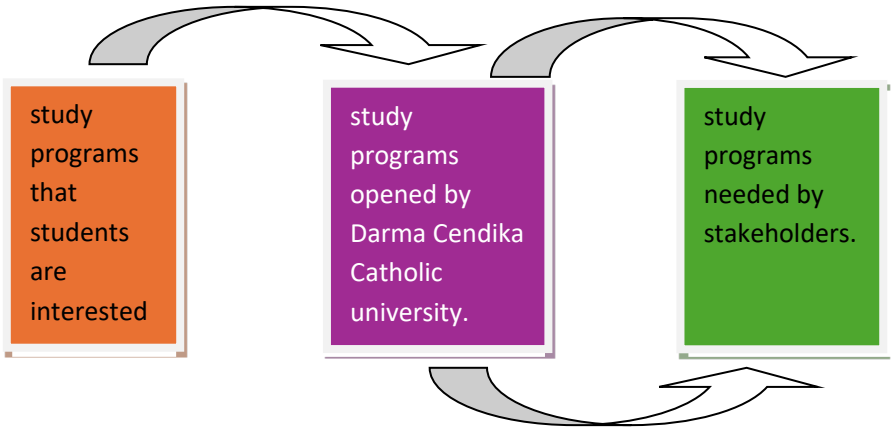

Figure 1. Program Study Needs and Interests

3. Research Methods

The Research related to the feasibility study of opening a study programme generally uses descriptive analysis, but there are still few studies that use the Analytical Hierarchy Process (AHP) method to describe the needs of study programmes according to market needs and interests. This research uses AHP as a method to measure market needs and interests related to study programmes in Surabaya City. The hope is that with this method, the priority needs and interests of the study programme to be established can be clearly seen, can truly answer the needs and interests of the market, and of course answer the challenges of the scientific domain of higher education itself. AHP is one of the tools that can show the ranking of needs and interests of study programmes that are the target of this research. The subjects of this research are high school/vocational school students in Surabaya City and company decision-makers in Surabaya City.

Descriptive Statistics

Descriptive statistics is one of the methods used in statistics in order to obtain a conclusion. Cluster analysis is one form of statistical tool classified as multivariate analysis. The main purpose of cluster analysis is to find out groups based on existing characteristics (Ediyanto and Satyahadewi, 2013). Regression analysis is one form of statistical tool classified in the multivariate section related to dependent variables and independent variables (Gudono, 2011; Hair et al, 2010). In this study, descriptive statistics were used to determine the responses of prospective students regarding the study programmes of interest when continuing their further studies. In this study, descriptive statistics are used to determine the responses of prospective students regarding the study programme they are interested in when continuing their further studies. The research limits the choices in the survey only to the list of study programmes included in the social humanities. This research will also conduct a survey to find out the criteria that are of interest to prospective students and stakeholders in determining the choice of study programmes in the social humanities. In this study using descriptive statistics which are used only to describe sample data, and not to make a conclusion about the population from which the sample is taken. Descriptive statistics in this study only produce temporary conclusions because the data is only seen based on an outline (Walpole & Myers, 1995; Rodman, 2018).

Analytical Hierarchy Process (AHP)

AHP is a decision-support model that can decompose complex multi-factor or multi-criteria problems into a hierarchy (Saaty, 2008). In addition, the Analytical Hierarchy Process is one of the supporting analytical tools in decision-making. This method will help in providing a sequence of alternative decisions and selecting the best analysis when making decisions (Dhartikasari, 2020). The hierarchy will help in simplifying a complex and unstructured problem into a hierarchical form (Marsono, 2020). In addition, a hierarchy is a representation of a complex problem in a multi-level structure. The first level is the goal, which is followed by the level of factors, criteria, sub-criteria, and alternatives.

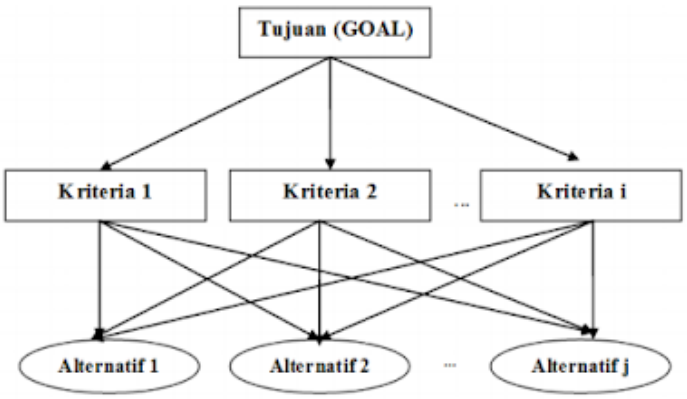

Figure 2. AHP Decomposition Structure (Source: Mulyono, 2004)

AHP is a method for ranking decision alternatives and selecting the best one with multiple criteria. AHP develops a numerical value to rank each decision alternative, based on the extent to which each alternative fulfils the decision maker's criteria (Taylor, 2014). AHP has three main principles in problem-solving, namely: Decomposition, Comparative Judgement, and Logical consistency. The AHP procedure includes the following steps: (1) Decomposition of the problem; (2) Judgement/weighting to compare elements; (3) Matrix preparation and Consistency Test; (4) Prioritisation of each hierarchy; (5) Synthesis of priorities; 6. Decision making. (Basak & Saaty, 1993). The first stage in AHP is the decomposition process of determining criteria and alternatives. The results of analyses related to study programmes that are most attractive to prospective students are alternatives in the AHP analysis, while the results of analyses related to the criteria that become the priority of study programme choices will become criteria in the AHP analysis of this research. The next stage in AHP research is to conduct Comparative Judgement. This research will involve the vice-rectors in determining the weighting at the criteria and alternative levels through a pairwise comparison approach. The next stage is to determine Logical consistency. This research will use Expert Choice software in the preparation of matrices and Consistency Tests; as well as in setting priorities in each hierarchy. The final stage of this research is to conduct a synthesis of priorities and decision-making to determine which study programmes in the socio-humanities group should be opened by Darma Cendika Catholic University.

4. Results and Discussions

Descriptive Statistics

Higher Education must be able to offer a product, in this case a study programme that is different from its competitors (Marginson, 2004). The position of a study programme can be said to be good when the institution can provide a degree that offers an increase in social status and lifelong employment opportunities in the eyes of students, parents, or users (Hirsch, 1976). Rasbin (2013:13) states that expectations are hopes about the future based on all the information available to them, such as market information, government policies,

international developments, and others. Expectations can be divided into 3, namely static expectations, adaptive expectations, and rational expectations. Related to the design of a policy, the commonly used expectation is a rational expectation (Rasbin, 2013: 13). Rational expectations can be understood as expectations related to the future as a result of a combination of static expectations that are idealistic, and adaptive expectations that are more pragmatic (Hasmy, 2019). Related to the education expected by a person, it is often associated with the work expected by that person. Therefore, the selection of study programmes cannot be separated from the needs of the market, and the work desired by a person.

The ranking of the expectations of 255 high school students in Surabaya City who will continue to higher education from the 8 socio-humanities study programmes given in the survey can be seen in Table 1.

Table 1. Selected Social-Humanities Study Programme

Selected Social-Humanities Study Programme	Total	%
Communication Studies	70	27.45
Psychology	40	15.69
Government Science	5	1.96
Economics	59	23.14
International Relations	34	13.33
Sociology	19	7.45
Political Science	20	7.84
Criminologist	8	3.14

Based on Table 1, it can be seen that Communication Science (27.5%), Economics (23.3%), and Psychology (15.7%) are the most popular socio-humanities study programmes for high school students. Table 2 abd Table 3 provides an overview of the background and reasons for choosing study programmes. Based on Table 2, it is known that the majority chose the study programme because of their own choice (93.3%), Table 3 provides an overview of the reasons why students choose the study programme, where in this study the majority of students chose the study programme because of their interest in exploring (55,6%) and promising job prospects (25.1%).

Table 2. Selected Social-Humanities Study Programme

Background to Choosing a Study Programme	Total	%
Own choice	238	93,33
Influence from friends	3	1,18
Influence from family	10	3,92
Direction from the school	2	0,78

Having no alternative choice	2	0.78

Table 3. Background For Choosing Study Programmes

Respondents' Reasons for Choosing the Study Programme	Interest to explore science	Career	Challenging	Personal desire	Job Opportunities	High income	No other alternative
Communication Studies	5						
Psychology	9						
Government Science							
Economics	9				6		
International Relations					4		
Sociology	3						
Political Science							
Criminologist							
Total	25	1	3		4	8	
%	5,6	,9	0,2	,3	8,4		.9

Based on the data above, it can be concluded that the majority of respondents chose their study programs due to their interest in exploring science, which reached 55.6%. Career factor also plays a significant role, with 28.4% of respondents choosing study programs based on the career opportunities offered. Meanwhile, the level of challenge and personal desire also are important factors in choosing study programs, each reaching 10.2% and 8% respectively. However, lower percentages are found for factors such as high income and no other alternative. This indicates that respondents tend to choose study programs based on personal interest and the career opportunities presented by the program.

Analytical Hierarchy Process (AHP)

The next stage in data processing is to perform calculations using the analytical hierarchy process method to determine which study programmes can be opened. In determining the priority study programmes to be opened, it is necessary to determine the criteria for making decisions by top management. The determination of criteria is done through expert judgement through a top-of-mind approach with the following results:

1. Criterion 1: Availability of lecturers with a minimum qualification of S2 Linear
2. Criterion 2: Amount of funds for investment and operations
3. Criterion 3: Interest of prospective new students

4. Criterion 4: Opportunities for partner support Cooperation from the business world and industry
5. Criterion 5: Opportunities for benchmarking support from partner universities
6. Criterion 6: In line with the university development plan.

Tabel 4. Pairwise Comparisons Between Criteria

	Availability of lecturers with a minimum qualification of S2 Linear	Amount of funds for investment and operations	Interest of prospective new students	Opportunities for partner support Cooperation from the business world and industry	Opportunities for benchmarking support from partner universities	In line with the university development plan
Availability of lecturers with a minimum qualification of S2 Linear	1	1/3	1/5	2	2	1
Amount of funds for investment and operations	3	1	3	2	2	2
Interest of prospective new students	5	1/3	1	5	5	3
Opportunities for partner support Cooperation from the business world and industry	1/2	1/2	1/5	1	1	1
Opportunities for benchmarking support from partner universities	1/2	1/2	1/5	1	1	1
In line with the university development plan	1	1/2	1/3	1	1	1

Table 4 is the result of the pairwise comparison score assessment on the basis of expert jugment conducted by the vice rectors as a consideration in determining the criteria for opening a new study programmeis the result of the pairwise comparison score assessment on the basis of expert jugment conducted by the vice rectors as a consideration in determining the criteria for opening a new study programme. Figure 2 is the result of calculating the weighting of each criterion with data processing using expert choice software, the analysis results show that the criteria that are the main considerations are the Interest of prospective new students with a criterion weight of 0.322.

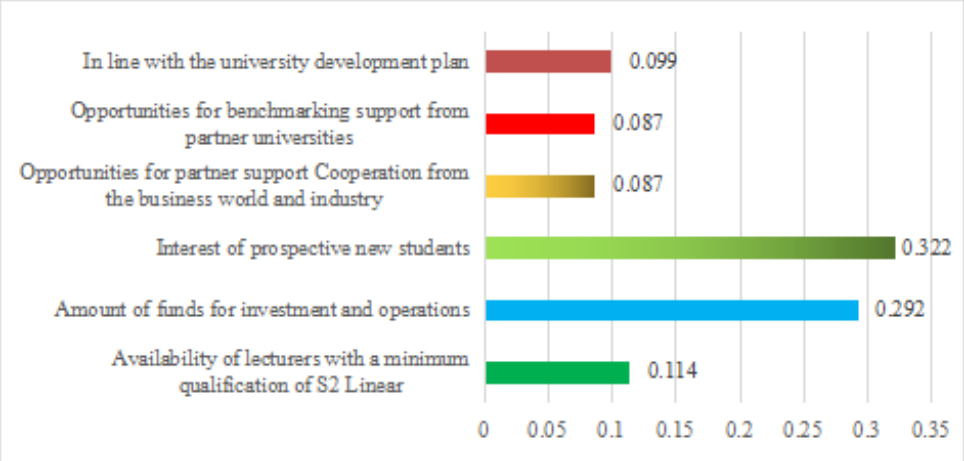

Figure 3. The Result Of Weighting Between Criteria

The results of the descriptive analysis shown in table 1, the most popular study programmes are Communication Science (27.5%), Economics (23.3%), and Psychology (15.7%), these three study programmes are alternative decision-making in determining which study programmes to open, the following are the results of pairwise comparisons conducted through an expert jugment approach :

Table 5. Results of AHP Analysis Criteria - Alternatives

Availability of lecturers with a minimum qualification of S2 Linear					
	Communication Science	Psychology	Economics	Wight	Consistency Ratio CR
Communication Science	1	3	1	0.60	0.00
Psychology	1/3	1	1/3	0.20	
Economics	1	3	1	0.20	
Amount of funds for investment and operations					
	Communication Science	Psychology	Economics	Wight	Consistency Ratio CR
Communication Science	1	3	1	0.43	0.00
Psychology	1/3	1	1/3	0.14	
Economics	1	1/3	1	0.43	
Interest of prospective new students					
	Communication Science	Psychology	Economics	Wight	Consistency Ratio CR
Communication	1	5	3	0.64	0.04

Science					
Psychology	1/5	1	1/3	0.10	
Economics	1/3	3	1	0.26	

Opportunities for partner support Cooperation from the business world and industry

	Communication Science	Psychology	Economics	Wight	Consistency Ratio CR
Communication Science	1	3	1/5	0.64	0.04
Psychology	1/3	1	1/3	0.26	
Economics	5	3	1	0.10	

Opportunities for benchmarking support from partner universities

	Communication Science	Psychology	Economics	Wight	Consistency Ratio CR
Communication Science	1	1/2	1/3	0.55	0.02
Psychology	2	1	1/3	0.24	
Economics	3	3	1	0.21	

In line with the university development plan

	Communication Science	Psychology	Economics	Wight	Consistency Ratio CR
Communication Science	1	5	3	0.64	0.00
Psychology	1/5	1	1/3	0.10	
Economics	1/3	3	1	0.26	

Table 5 shows the calculated weights for each alternative on each criterion. The consistency ratio value shows that all calculations are below 10% so that the AHP calculations that have been carried out are declared feasible. The results of the analysis in Figure 2, namely the weight of each criterion, and Table 4, namely the relative weight of each alternative for each criterion are used in the calculation of alternative weights as a basis for determining which study programme decisions are prioritised for consideration to be proposed.

Tabel 6. Relative Weight Of Study Programme Alternatives

	Alternative Weight	Criteria Weight	Total
Availability of lecturers with a minimum qualification of S2 Linear			
Communication Science	0.60	0.114	0.07
Psychology	0.20	0.114	0.02
Economics	0.20	0.114	0.02
Amount of funds for investment and operations			
Communication Science	0.43	0.292	0.13
Psychology	0.14	0.292	0.04
Economics	0.43	0.292	0.13
Interest of prospective new students			
Communication Science	0.64	0.322	0.21
Psychology	0.10	0.322	0.03
Economics	0.26	0.322	0.08
Opportunities for partner support Cooperation from the business world and industry			
Communication Science	0.64	0.087	0.06
Psychology	0.26	0.087	0.02
Economics	0.10	0.087	0.01
Opportunities for benchmarking support from partner universities			
Communication Science	0.55	0.087	0.05
Psychology	0.24	0.087	0.02
Economics	0.21	0.087	0.02
In line with the university development plan			
Communication Science	0.64	0.099	0.06
Psychology	0.10	0.099	0.01
Economics	0.26	0.099	0.03

Total relative weight of study programme alternatives

Alternative	Total Wight
Communication Science	0.57
Psychology	0.15
Economics	0.28
Total	**1.00**

Based on the analysis results shown in Table 6, it is finally known that the Communication Science Study Programme (0,57) has the highest weight, therefore it can be said that the Communication Science Study Programme is the most likely study programme to be opened. In addition, the Economics Study Programme, and Psychology Study Programme, are alternative study programmes to be opened.

5. Conclusion

Based on data processing obtained from 255 high school students in Surabaya City, it is evident that the study programmes of interest are Communication Science, Economics, and Psychology. Utilizing the Analytical Hierarchy Process method for data processing, it is found that the Communication Science Study Programme holds the highest weight. Therefore, it is recommended that the feasible study programme to be opened at Darma Cendika Catholic University is the Communication Science Study Programme. However, there are two other study programmes that can serve as alternatives, namely the Economics Study Programme and the Psychology Study Programme. These findings provide valuable input for leaders at Darma Cendika Catholic University regarding potential study programmes to be established. Furthermore, these findings serve as the foundation for further research on the feasibility of opening a new study programme.

The findings related to possible study programmes to be opened can be pursued further. Conducting an assessment of the feasibility of the Communication Science Study Programme can offer a more detailed understanding of its viability. It is worth noting that this research focuses solely on the socio-humanities cluster of study programmes; therefore, the results may vary if other clusters are included in the study.

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