

# WEIGHTING FACTORS AFFECTING VOCATIONAL EDUCATION DEVELOPMENT TO SUPPORT REGIONAL POTENTIAL

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## Abstract

The demand for skilled human resources improvement in the era of the Asian Economic Community. Therefore, the government has significantly increased the number of skilled workers until 2019 to meet the needs of various sectors, especially education that provides life skills competence in accordance with regional potential. This study aims to determine the factors that affect the development of vocational education to support the potential areas found by using the Delphi method. Factors found are distance (between population and school), population, number of junior high school students, road network, public transportation, land price, disaster prone, natural resource production, community participation, government commitment (policy making), human resources school manager.

**Keywords:** Vocational Education Development, Vocational Senior High School, Regional Potential

## 1. Introduction

According to data obtained from the Education Office in 2016, there are 2 units of public vocational schools, and 46 units of private vocational schools. Based on the same educational access, it shows unevenness in every region or sub-district. Therefore, the government needs to build vocational high schools, especially in areas where there is no access to vocational education.

From the preliminary survey in two Vocational Senior High School (here in after referred to as SMK), it was found that 2 units of National SMK were in Kalianget Subdistrict, and Batuan Urban Village. This location was chosen because the number of people aged 16-18 years amounted to 46,635 people or 31.38% of the 148,632 people the permanent population in Sumenep located in two areas, while the remaining 68.62% or equivalent to 101,991 people spread over 25 districts others. These figures show that comparisons between total and total population, vocational high schools are inadequate.

### 1.1 Research Question

Several things are needed to develop and find vocational education solutions by taking stock of what factors affect the development of vocational education to support local potential. The formulation of the problem as follows: What factors affect the development of vocational education to support the potential area in Sumenep?

## 1.2 Scope and Limitations of the Study

The scope of this study is in Sumenep, Madura, whereas the substance in this study is limited to weighting factors that affect the development of vocational education to support potential areas in Sumenep regency. Vocational education here is vocational education at the middle or vocational level.

## 2. Review of Related Literature

### 2.1 Policy in Education Development

Education is a very important thing, because in the era of knowledge-based economy, the quality of education is possible to raise the dignity and the nation in many ways, for example in economics, health, prosperity, competitiveness and technology.

In the social context, the purpose and content of vocational education is linked to the increasing needs of the business world and the industrial world. Vocational education plays a crucial role by determining the level and direction of community change in the vocational field. Education with a dual function is as a means of cultural preservation and as a medium for the occurrence of social change.

Education is essentially inseparable from human life is always growing and developing. Education is a basic and absolute necessity and is always needed. Education policy deals with decisions on improving and improving the quality of educational organizations.

The development of long-term education refers to Law No. 17 of 2007 on the National Long Term Development Plan (RPJPN) for 2005-2025. The focus on the plan is the development of education at each stage formulated in the 2005-2025 National Long Term Development Plan. In medium-term planning, it may be adjusted or improved in accordance with current conditions through the National Medium Term Development Plan.

### 2.2 Education for Sustainable Development

Human Resource Development has demonstrated a paradigm shift in education by emphasizing processes such as critical thinking, problem solving, the development of a holistic vision, a logical-oriented system of thinking and relevance as well as the interdisciplinary and interdisciplinary approaches that are translated into identifying interconnections within teaching, learning and research. It shows an interdisciplinary relationship that fosters the development of common skills in 'connecting thinking' that is transferred to practical situations (UNESCO, 2008).

In the last few decades, many researchers and practitioners have requested an evaluation of the HRD program (Jacobson et al., 2006; Carleton-Hug and Hug, 2010; Zint, 2011). Monitoring and evaluation are identified as key strategies for implementing the Education Development for Sustainable (ESD) strategy, and the ongoing national strategy and Human Resources Development (HRD) strategy (Erdogan and Tuncer, 2009). The effectiveness and value of these methods, together with the measurement and evaluation of their progress, remains an open question for policy makers, academic researchers and practitioners (Reid et al., 2006, p. 22).

### 2.3 Education in Local and Cultural Relativism Context

A common methodology of program evaluation includes the National Foundation for Research (NFER) by applying the "citizenship" curriculum in the UK (Kerr, 2006), or the "21" Training Center Program in Germany (de Haan, 2006) as well as the generic EFS checklist (Schroter, 2010). However, it remains unclear whether national evaluation studies or examples of best practice can be universally applied in other countries, as many anthropologists have shown (Owens, 2012). A broad work on class ethnography involving ethnographers to enter the "lesson" world through participant observations has not yet been fully employed in formal educational settings for dealing with ESD.

ESD runs something different in its socio-political priorities, such as democracy in educational institutions, and other historical, socio-cultural, political, ecological and economic factors. Some types of ESD are used in

more appropriate social and health situations in some conditions, for example, issues related to reproductive health in developing countries; as for the larger environmental conditions of this issue is more appropriate for others, as related to from the high level in the more prosperous society. The diversity is structured in a broader sociocultural context in which formal and informal learning takes place (Zarger, 2010; Efird, 2011; Kopnina 2013; Anderson, 2012).

#### **2.4 Competence Education**

The term "competence" in the context of education and technological progress and globalization coupled with new challenges to be mastered; enhance individualization and development of social diversity, in parallel by tracking economic and cultural uniformity, rapid information, to efficiency and uncertainty.

In this term it is used to describe "in the future the ability to transform and shape the new future of our society through active participation in sustainable development". "Gestaltungs competence" includes the following eight core competencies:

- 1) Competence in the future;
- 2) Competence in interdisciplinary work;
- 3) Competence in cosmopolitan perception, cross-cultural understanding and cooperation;
- 4) Participatory skills;
- 5) Competence in planning and implementation;
- 6) Capacity for empathy, compassion and solidarity;
- 7) Competence in self-motivation and motivation of others; and
- 8) Competence within the distance of reflection on individual models and cultures

In terms of sustainable development requires social modernization and can only be realized through the active participation of competent citizens of their fields; Therefore the concept of "Gestaltungs Competence" is characterized by the major competencies required in future and independent participation in shaping and developing continuing education. Competent education here adapted to the needs in the development of potential field of course.

#### **2.5 Human Resource Education Development through Vocational Education**

In this case one of the policies of the Ministry of Education and Culture of the Republic of Indonesia in the development of human resources at Vocational High School was introduced in 1993/1994 is the education of Link and Match, which means that Senior High School education must be connected and in accordance with the needs of students and the community to creating a match between educational programs and community needs. The link and match policy for vocational secondary education is conducted using the Dual System Education (DSE) program. For vocational education institutions, DSE is necessary because it affects graduates to face the world of work. The DSE program is a policy to prepare vocational students to be ready and understand the demands of the world of work.

There are differences in Singapore and Hong Kong policies, the establishment of educational centers is mandatory in recruiting foreign workers, especially students and researchers. In this regard, Singapore is pursuing it more aggressively than Hong Kong because of the implications of declining birth rates and nearest economic competition (Government of Singapore 2013). Meanwhile, Hong Kong makes China a supply shortage in urban employment planning. (Lee, 2014).

#### **2.6 Public Interest in Vocational Education**

Therefore, based on the 1945 Constitution of the State of the Republic of Indonesia, one of Indonesia's national goals is to educate the nation's life and to get the best education according to one's interests and talents without distinction of social status, race, ethnicity, religion and gender. Thus, the development of education should pay attention to the interests of learners. Interest can be interpreted as the power that arises

in the individual to act. Interests greatly affect the individual in accepting a particular object and it is influenced by 2 factors, namely:

- a. Internal factors, including:
  - 1) Individual talent
  - 2) Academic achievement
- b. External factors, including: the socio-economic conditions of the family, among others:
  - 1) The background of parent education
  - 2) Family income and parental profession
  - 3) Number of families

Attention is often directed at the recruitment of international students, the development of local talent will remain a primary and fundamental goal in the relationship of education. Therefore, talent development includes planning on labor and inclusive provisions that support the interests of different local students. On the other hand, educational relationships do not share the purpose of attracting foreigners and repatriating diaspora talents. Contextual factors such as political economy and different ethnic sensibilities mediate the recruitment of external talents. (Lee, 2014.)

Government permission to foreign parties wishing to build campus, destination or host country should classify such higher education, increase research capacity, and improve the overall benefits of the education system. Most importantly, the development of educational relationships can develop human talent to compete in the global knowledge economy (Cheng 2010; Knight and Lee 2014). Previous studies on educational relations provide limited analysis of talent development or focusing only on foreign talent (Chan and Ng 2008; Knight and Morshidi 2011).

### **3. Research Methodology**

The explorative study is to examine the relationship between regional potentials to determine the concept of vocational education development in Sumenep. Case studies were undertaken in conducting this research which stem from the problems arising from the development of vocational education in potential areas in Sumenep.

#### **3.1. Sampling and Population**

The sample used in this research is purposive sampling because (1) background of respondent (expert) in education and local economy and (2) limited time, cost and power.

Purposive sampling is done by determining a specific target or a predetermined respondent. This is the appropriate sampling technique, including:

- (1) Department of Education Sumenep
- (2) BAPPEDA Sumenep (social and cultural division)
- (3) Scholars, People who graduated from university or have high intelligence
- (4) Civic organization (education council)
- (5) Sumenep parliament (education division)
- (6) Department of Education and Culture of East Java Province (Division of Vocational Education)

#### **3.2. Data Analysis**

Accumulated data are gradually interpreted into the general overview for analysis, and further according to the allotment of data in the analysis. Quantitative techniques of this study. Quantitative techniques use hierarchical process analysis (AHP). Data on factors affecting the development of vocational education are derived from Delphi analysis from previous studies. The analysis steps include among others:

3.2.1. The weighting factor determining the location of vocational high school development in supporting the potential of the region

In this study the purpose of the use of AHP analysis techniques is more to know the expert opinion about the conditions that affect the determination of the location of SMK development in supporting the potential area, which can be known amount in the form of weight per sub variable. Although the main objective is the priority of determining the location of SMK development but basically AHP measure quantity perception in quantity.

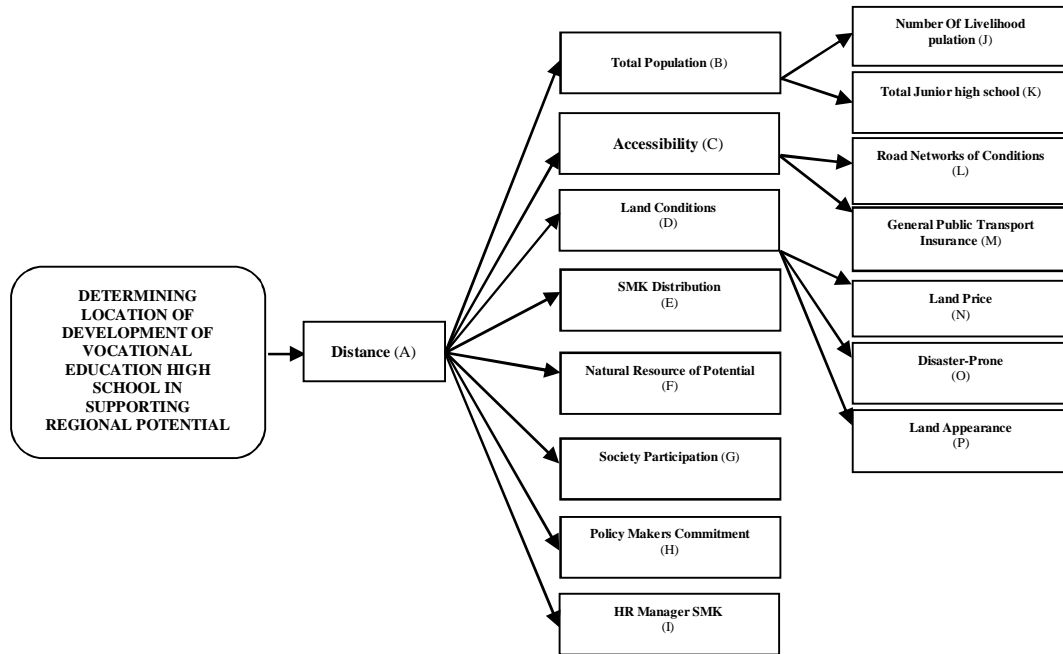


Figure 1. Flow chart AHP factors influence in determining the location of vocational education development

The first thing to do is to make each of these factors into matrices with alphabetical symbols for easy processing by AHP using excel. The factor matrix is as follows:

Matrix A = Range

Matrix B = Population

Matrix C = Accessibility

Matrix D = Condition of land

Matrix E = SMK distribution

The Matrix F = Potential of natural resources

The Matrix G = Participation

Matrix H = Commitment of policy-making

Matrix I = HR management SMK

Calculation used is the average cumulative ratio of valuation ( $R / 6$ ) as shown in table 3.1. Diagonal matrix  $AA = BB = CC = DD = EE = FF = GG = HH = II = 1$  for doing comparison with factors in itself. Matrix calculation  $BA = 1 / \text{matrix } AB$  so on.

Table 1. Initial matrix of analysis results

	A	B	C	D	E	F	G	H	I
A	1,000000	0,141138	0,154365	2,161310	0,181151	0,158333	0,490476	0,120370	0,780952
B	7,085286	1,000000	2,114286	6,166667	4,069444	1,304167	1,377778	0,126984	0,798810
C	6,478149	0,472973	1,000000	5,8333333	2,1170635	2,255952	1,900000	0,126984	1,155556
D	0,462682	0,162162	0,171429	1,000000	1,290675	0,133929	2,057143	0,121693	1,455556
E	5,520263	0,245734	0,472352	0,774789	1,000000	3,220833	2,200000	0,126984	3,500000
F	6,315789	0,766773	0,443272	7,466667	0,310479	1,000000	5,500000	0,182143	5,500000
G	2,038835	0,725806	0,526316	0,486111	0,454545	0,181818	1,000000	0,146032	1,755556
H	8,307692	7,875000	7,875000	8,217391	7,875000	5,490196	6,847826	1,000000	8,333333
I	1,280488	1,251863	0,865385	0,687023	0,285714	0,181818	0,569620	0,120000	1,000000
$\Sigma$	38,489185	12,641449	13,622404	32,793290	17,584072	13,927047	21,942843	2,071190	24,279762

Source: Result of analysis, 2018

The data obtained will be normalized by dividing each column data by the column average as shown in table 2 below:

Table 2. Normalize experiment data

	A	B	C	D	E	F	G	H	I
A	0,025981	0,012012	0,011814	0,064917	0,010771	0,010375	0,022018	0,058117	0,030690
B	0,184085	0,085111	0,161808	0,185223	0,192420	0,129147	0,061850	0,061310	0,070690
C	0,168311	0,040255	0,076531	0,190229	0,125881	0,191517	0,100257	0,061310	0,078160
D	0,012021	0,013802	0,012084	0,030036	0,076744	0,008776	0,092347	0,058755	0,057201
E	0,143424	0,026300	0,036150	0,023272	0,059460	0,211059	0,098760	0,061310	0,111345
F	0,164093	0,043185	0,026186	0,224269	0,018461	0,065529	0,246901	0,087941	0,216140
G	0,052972	0,061774	0,034268	0,014601	0,027027	0,011914	0,044891	0,070506	0,068990
H	0,215845	0,670246	0,602681	0,246818	0,468249	0,359768	0,307406	0,482814	0,327485
I	0,033269	0,047315	0,038479	0,020635	0,020986	0,011914	0,025571	0,057938	0,039298

Source: Result of analysis, 2018

Judging from the magnitude of eigenvalue it can be said that as a calculation of factor priority obtained in the experiment. The result of eigenvalue calculation can be seen in table 3. as follows:

Table 3. Normalize experiment

	Number of Line Matrices	Wi
A	0,246696	0,027411
B	1,131643	0,125738
C	1,032449	0,114717
D	0,361766	0,040196
E	0,771079	0,085675
F	1,092705	0,121412
G	0,386943	0,042994
H	3,681313	0,409035
I	0,295406	0,032823
	$\sum Wi$	1

Source: Result of analysis, 2018

### 3.2.2. Scoring Analysis

Scoring analysis is the analysis used to determine the weight of each factor. The valuation method used is multiplying the weight value of each factor and sub factor of AHP result with the existing condition. This multiplication is intended to obtain the most objective weight value of expert opinion and conditions in the field, so the determination of SMK development location in both regions should not be minimized.

Data classification makes rankings based on classification. The weighted value of each factor and sub-factor of the AHP result can be made from the total weight value held by each classification, as shown in Table 4 below:

Table 4. Classification Weighting Spatial Factor

No.	Influential factors	Classification	Ranking score	Weight	Total weight
1	Distance of school with settlements	Dkt > 5km	1	0.274	0.274
		Dkt > 4 – 5km	2		0.548
		Dkt 2 – 4 km	3		0.822
		Dkt 0 – < 2km	4		1.096
2	Total population	< 10000 sokk	1	1.322	1.322
		10001 – 20000 sokk	2		2.644
		20001 – 30000 sokk	3		3.966
		> 30000 sokk	4		5.288
3	Number of Junior high school students	500 – 1000 students	1	8.678	8.678
		1001– 1500 students	2		17.356
		1501– 2000 students	3		26.034
		> 2000 students	4		34.712
4	Land condition	Heavily damaged	1	7.069	7.069
		Mildly damaged	2		14.138
		Enough	3		21.207
		Good	4		28.276
5	Availability of public transportation	Not to be skipped	1	2.931	2.931
		Partially skipped	2		5.862
		Mostly skipped	3		8.793
		Skipped until location	4		11.724
6	The land price	> 900.000	1	6.684	6.684
		> 600.000 – 900.000	2		13.368
		> 300.000 – 600.000	3		20.052
		100.000 – 300.000	4		26.736
7	Disaster-prone	Very vulnerable	1	1.922	1.922
		Medium	2		3.844
		Quite safe	3		5.766
		Safe	4		7.688
8	Land use	Settlement	1	1.394	1.394
		Weir	2		2.788
		Rice fields	3		4.182
		Plantation	4		5.576
9	vocational high School distribution	there are >3SMK	1	0.857	0.857
		there are 2-3SMK	2		1.714
		there is 1 SMK	3		2.571
		there is no SMK	4		3.428

Source: Result of analysis, 2018

#### 4. Conclusion

Through the above discussion, in this case the commitment of policy makers with a weight value of 0.409 is the highest value of weight, i.e. 40.9% factor that most influence on other factors that affect. While the population has a weight of 0.166 or 12.6% against the influence of other factor weight on vocational school construction. Regional potential / Natural Resources with a weight value of 0.21 is a factor affecting the

development of SMK with a weight of 12.1% on the percentage of influence of the weight of other factors. Furthermore, for accessibility factor has weight of influence 0,115 or 11,5% to influence other factor, factor of SMK Distribution have influence of weight of 0,086 or 8,6% to other factor, society participation factor influence to weight of 0,043 or 4,3%. Against the influence of other factors, the land condition factor has a weighted value of 0.040 or 4.0% against the influence of other factors, the factor of human resource manager has a weight of 0.033 or 3.3% against other factors concerning the influence of vocational school construction, and distance is the most factor no effect on other factors that is equal to 0.027 or 2.7% towards the development of vocational schools as long as support the potential area in Sumenep regency.

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