Productivitiy Based On Input Orientation of Senior High School in Dumai-Riau-Indonesia for Academic Session of 2011/2012

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A R T I C L E   I N F O

A B S T R A C T

Background: Youth is one of the assets of the country. One way to develop the ability and skills to youth is through education. Education is an effective ways in developing character and personality of the nation. The type and selected school gives the impression of a significant influence on education. It was often found in the admission of new student that every parent wants their children to get the best school. **Objective:** Assessment of the best school is mostly done by the perceptions that build in society based on effective marketing strategy which is called word of mouth. Based on that situation, a scientific study is needed to see productivity of Senior High School (SMA) in Kota Dumai as a guidance and information for parents and the community in determining the appropriate school for their children. **Results:** Data in this study is taken from the Department of Education in Dumai for academic year of 2011/2012. The type of analyzed productivity was input based orientation. The inputs are the number of teachers, number of students, and the number of classrooms. **Conclusion:** SMA Budi Dharma is the most efficient school.

INTRODUCTION

Education cannot be separated from human life. A student at the university and school students will be educated by teachers and lecturers. Education is the property and also a tool for humans. In this world there are no other creatures besides humans that need education. About the meaning of education itself can be divided into three parts, there are education, the general theory of education and science education. The definition of education is the education that is done by the general public, where such education has been around since humans exist on earth. Another purpose of educate is to make people become more perfect, make improving human life from natural life into cultured. According to Imran Manan (1989) there are five components of culture, which are idea, ideology, norm, technology and object.

Beside of that, definition of education based on public theory of education that comes from the view of John Dewey, it is a member of education expert in the 19th century in the united states. He said that education is the genereal theory of education. In another section he also said philosophy is the general theory of education (TIM MKDK 1990). It means that John Dewey didn't differentiate philosophy of education with theory of education, because he said that education is a public theory. The concept above comes from the pragmatic philosophy or philosophies of progressive education were largely adopted by educators in the United Syarikat. The terrace of pragmatic philosophy is which is useful for people that are true. What is useful not useful right now because the next year is not necessarily beneficial. While the core of the philosophy of progressive education is constantly looking for something that is most useful for life and human life. The discovery never stops for long periods at a certain point. There is no final destination, the goals are temporary. Because current purpose of education is not necessarily satisfy the next year.

Then, the school productivity is a benchmark and reference to the actual school quality. Assessment to the performance of school can't be done by perception and assumptions form the society. One of those is the education in Kota Dumai, through research and observation conducted an assessment of the productivity of the school is done only through perception, therefore a scientific study should be done to look at the actual level of productivity.

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Literature Review:

The concept of productivity is basically the ratio of output to input for a specific production conditions. (Rogers, 1998). It is essentially a measure of the effectiveness and efficiency of the organization in generating output with the available resources (SPRING Singapore, 2011). Education is considered as one of the most important investments for the future of individuals and nations. Investment in knowledge, skills and capacities that are relevant for the individual and for society (OECD 2009). Society has a lot of expectations on quality and productivity in the world of education, there is always debate about how to meet the expectations, how to produce the productivity of school with provided resources is the most discussed subjects. Productivity of education is include effective performance with an indicator covering many new student enrolled and over, many graduates and quality, beneficial knowledge acquired by graduates and graduates are able to live independently (Engkoswara 2001). While the second is an efficient environment with an indicator which are the use of little time and cost, high learning motivation, gained trust from many people, education service are relatively inexpensive and affordable by all segments of society

Methodology:

The data from this research will be analyzed through DEAP 2.1. Input and ouput data are taken from the result of data collection in the Education Department at Kota Dumai Riau Indonesia. This research is conducted to analyzed the efficiency and productivity of schools at Kota Dumai for academic year of 2011/2012.

INPUT

There are three inputs involved in this study:

i) Number of teacher `

Total number of teachers is the number of teachers who teach in the High School in Dumai

ii) Number of student

The number of students is the students who received the learning process and registered in Senior High Schools in the city of Dumai

iii) Number of Classroom

Total number of classrooms is available classroom for learning and teaching process.

OUTPUT

Output involved in this study is the number of students who pass the national exam. It means that the students who are declared to have passed the national examination during the announcement of the result and awarded high school graduation certificate by Ministry of National Education Republic of Indonesia.

Efficiency Performance Data For National Examination Achievement of Secondary Schools In Dumai Riau Indonesia:

Table 1: High school input and output data at Kota Dumai.

No	Schools	Input			Output
		Number of teachers	Number of students	Number of classrooms	Number of graduated students
1	SMAN BINSUS	36	111	15	111
2	SMAN 1	49	182	21	182
3	SMAN 2	88	332	31	332
4	SMAN 3	55	157	21	157
5	SMAN 4	32	126	10	122
6	SMAN 5	39	98	11	98
7	SMA PGRI	20	74	8	74
8	SMA MUHAMMADIYAH	19	21	3	21
9	SMA LANCANG KUNING	17	30	5	30
10	SMA BUDI DHARMA	40	336	24	336
11	SMA YKPP DUMAI	51	293	22	292
12	SMA SANTO TARCISIUS	20	143	12	143

RESULT AND DISCUSSIONS

Summary Of Technical Efficiency Analysis Based On Input and Output Data:

Table 2: Summary of Technical Efficiency Analysis of national examination performance of high school at Kota Dumai.

Schools	Technical efficiency (te)
1	1.000
2	1.000
3	1.000
4	1.000
5	0.968
6	1.000
7	1.000
8	1.000
9	1.000
10	1.000
11	0.997
12	1.000

Summary of efficiency as seen at table 2 show the analysis from DEA model result on the efficiency performance of the National examination achievement of secondary schools at Kota Dumai Riau Indonesia for academic year of 2011/2012. Based on the technical efficiency can be seen that the firm that represent the schools that have the value of 1.000 is set to be efficient. While the value that less than 1.000 is show the inefficiency that need the improvement in terms of input and output value. Referring to the above analysis, it appears that the School 1, School 2, School 3, School 4, School 6, School 7, School 8, 9 School, School 10, School 12 is more efficient to achieve the efficiency of 1.000 compared with other schools. This is influenced by the values of input and output that is used as the basis of analysis of thismodel.

Summary of Peers:

Table 3: Summary of peers for input oriented

Schools	Peers
1	10
2	10
3	10
4	10
5	10
6	10
7	10
8	10
9	10
10	10
11	10
12	10

Summary of peers shows that efficient schools at Kota Dumai were used as a benchmark to the inefficient schools. Based on data at table 3, it can be formulated that school 10 is more efficient than other efficient schools. Because school 10 has been used as a benchmark for 11 times than others. It means that school 10 is the most efficient.

Input based orientation:
Summary of weight peers:

Table 4: Summary of weight peers

Schools	Weight peers
1	0.330
2	0.542
3	0.988
4	0.467
5	0.363
6	0.292
7	0.220
8	0.063
9	0.089
10	1.000
11	0.869
12	0.426

Table 4 shows the summary of weight peers, it shows the shadow price for every efficient school. Shadow price is used to improvement of the schools to produce better and efficient academic performance.

Peer Count Summary

Table 5: Peer count summary

Schools	Peer count
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	11
11	0
12	0

Table 5 gives the description to the efficient schools and the frequency of its used as a benchmark to the improvement of the inefficient schools. It can be seen that school 10 is better than other schools based on the frequency as a benchmark.

School By School Result:

Result of school   : 1
Technical efficiency   : 1.000

Table 6: Result of school 1 for input based orientation

Variable	Original value	Radial movement	Slack movement	Projected value
Output	111.000	0.000	0.000	111.000
Input 1	36.000	0.000	-22.786	13.214
Input 2	111.000	0.000	0.000	111.000
Input 3	15.000	0.000	-7.071	7.929

Listing of peers

Peer	Lambda weight
10	0.330

School 1 at table 6 shows the inefficient from three inputs that involved in the production of one output. The improvement should be made for two input of school 1. Input 1 (number of teachers) should be reduced by 63.3% to achieve efficiency. While for input 3 (number of classroom) the reduction should be made by 47.14%.

Result of school   : 2
Technical efficiency: 1.000

Table 7: Result of school 2 for input based orientation

Variable	Original value	Radial Movement	Slack movement	Projected value
Output	182.000	0.000	0.000	182.000
Input 1	49.000	0.000	-27.333	21.667
Input 2	182.000	0.000	0.000	182.000
Input 3	21.000	0.000	-8.000	13.000

Listing of peers

Peers	Lambda weight
10	0.542

Table 7 shows the inefficiency of school 2 from 3 inputs involved in the production of one output. The improvement should be made for two inputs. The analysis showed that Input 1 (number of teacher) should be reduced by 55.78% to achieve efficiency. While, the reduction should be made for input 3 (number of classroom) by 38.09%.

Result of school   : 3
Technical efficiency   : 1.000

Table 8: Result of school 3 for input based orientation

Variable	Original Value	Radial movement	Slack Movement	Projected value
Output	332.000	0.000	0.000	332.000
Input 1	88.000	0.000	-48.476	39.524
Input 2	332.000	0.000	0.000	332.000
Input 3	31.000	0.000	-7.286	23.714

Listing of peers

Peer	Lambda weight
10	0.988

Table 8 shows the inefficiency of school 3 of 3 inputs in the production of one output. The improvement should be made for 2 inputs of school 3. The input 1 (number of teacher) and input 3 (number of classroom) should be reduced by 55.08% and 23.50%.

Result of school   : 4
Technical efficiency   : 1.000

Table 9: Result of school 4 for input based orientation

Variable	Original value	Radial movement	Slack movement	Projected value
Output	157.000	0.000	0.000	157.000
Input 1	55.000	0.000	-36.310	18.690
Input 2	157.000	0.000	0.000	157.000
Input 3	21.000	0.000	-9.786	11.214

Listing of peers

Peer	Lambda weight
10	0.467

School 4 as seen at table 9 showed the inefficiency of 3 inputs invlovled in the production of one output. In order to achieve efficiency, input 1 (number of teachers) should be reduce by 66.01 and input 3 (number of classroom) should be reduce by 46.6%.

Result of school   : 5
Technical efficiency   : 0.968

Table 10: Result of school 5 for input based orientation

Variable		Original value	Radial movement	Slack movement	Projected value
Output	1	122.000	0.000	0.000	122.000
Input	1	32.000	-1.016	-16.460	14.524
Input	2	126.000	-4.000	0.000	122.000
Input	3	10.000	-0.317	-0.968	8.714

Listing of peers

Peer	Lambda weight
10	0.363

Table 10 shows the inefficiency of school 5. The improvement should be made for input involved in the production of one output. Input 1 (number of teacher) and input 3 (number of classroom) should be reduced by 54.61% and 3.71%.

Result of school   : 6
Technical efficiency   : 1.000

Table 11: Result of school 6 for input based orientation.

Variable	Original value	Radial movement	Slack movement	Projected value
Output	98.000	0.000	0.000	98.000
Input 1	39.000	0.000	-27.333	11.667
Input	98.000	0.000	0.000	98.000
Input	11.000	0.000	-4.000	7.000

Listing of peer

Peer	Lambda weight
10	0.292

Table 11 shows the inefficiency of school 6 from three inputs that involved in the production of one output. The amount of input 1 (number of teacher) and input 3 (number of classroom) should be reduced by 70.08% and 36.36%.

Result of school   : 7
Technical efficiency   : 1.000

Table 12: Result of school 7 for input based orientation

Variable	Original value	Radial movement	Slack movement	Projected value
Output	74.000	0.000	0.000	74.000
Input 1	20.000	0.000	-11.190	8.810
Input 2	74.000	0.000	0.000	74.000
Input 3	8.000	0.000	-2.714	5.286

Listing of peers

Peers	Lambda weight
10	0.220

Table 12 shows the inefficiency of three inputs involved in the production of one output of school 7. The improvement should be made by reducing the value of input 1 (number of teacher) and input 3 (number of classroom) by 55.95% and 33.92%.

Result of school   : 8
Technical efficiency   : 1.000

Table 13: Result of school 8 for input based orientation

Variable	Original value	Radial movement	Slack movement	Projected value
Output	21.000	0.000	0.000	21.000
Input 1	19.000	0.000	-16.500	2.500
Input 2	21.000	0.000	0.000	21.000
Input 3	3.000	0.000	-1.500	1.500

Listing of peers

Peer	Lambda weight
10	0.063

School 8 at Table 13 shows the inefficiency of three inputs involved in the production of one output of school 8. The improvement should be made by reducing the value of input 1 (number of teacher) by 86.84% and input 3 (number of classroom) by 50% in order to achieve efficiency.

Result of school   : 9
Technical efficiency   : 1.000

Table 14: Result of school 9 for input based orientation

Variable	Original value	Radial movement	Slack movement	Projected value
Output	30.000	0.000	0.000	30.000
Input 1	17.000	0.000	-13.429	3.571
Input 2	30.000	0.000	0.000	30.000
Input 3	5.000	0.000	-2.857	2.143

Listing of peers

Peer	Lambda weight
10	0.089

School 9 as seen at table 14 showed the inefficiency of three input involved in the production of one output. Because of that, the value of input 1 and 3 should be reduced in order to achieve efficiency. Input 1 (number of teacher) should be reduced by 78.99% while input 3 (number of classroom) should be reduced by 57.14%.

Result of school   : 10
Technical efficiency   : 1.000

Table 15: Result of school 10 for input based orientation

Variable	Original value	Radial movement	Slack movement	Projected value
Output	336.000	0.000	0.000	336.000
Input 1	40.000	0.000	0.000	40.000
Input 2	336.000	0.000	0.000	336.000
Input 3	24.000	0.000	0.000	24.000

Listing of peers

Peer	Lambda weight
10	1.000

Table 15 shows the efficiency of school 10 from three input in the production of one output. The value of technical efficiency is 1.000. the analysis shows that school 10 has 40 teachers, 336 students, and 24 classrooms to produce excellent academic performance that include the student who pass the national examination with the amount of 336 students for academic year of 2011/2012.

Result of school   : 11
Technical efficiency   : 0.997

Table 16: Result of school 11 for input based orientation.

Variable	Original value	Radial movement	Slack movement	Projected value
Output	292.000	0.000	0.000	292.000
Input 1	51.000	-0.174	-16.064	34.762
Input 2	293.000	-1.000	0.000	292.000
Input 3	22.000	-0.075	-1.068	20.857

Listing of peers

Peer	Lambda weight
10	0.869

Table 16 shows the inefficiency of school 11 in the production of one output from three inputs. The improvement should be made by reducing the value of each input. Input 1 (number of teachers) should be reduced by 31.83% in order to achieve efficiency while input 2 (number of student) should be reduced by 0.34% and input 3 (number of classroom) by 5.19%.

Result of school   : 12
Technical efficiency   : 1.000

Table 17: Result of school 12 for input based orientation

Variable	Original value	Radial movement	Slack movement	Projected value
Output	143.000	0.000	0.000	143.000
Input 1	20.000	0.000	-2.976	17.024
Input 2	143.000	0.000	0.000	143.000
Input 3	12.000	0.000	-1.786	10.214

Listing of peers

Peer	Lambda weight
10	0.426

School 12 in Table 17 shows the inefficiency of three inputs involved in the production of one output. The improvement should be made by reducing the value of each input. Input 1 (number of teacher) and input 3 (number of classroom) should be reduced 14.88%.

Conclusion:
The result of analysis shows that school 10 or SMA Budi Dharma is the most efficient school. This is evidenced by the frequency of use of the school as a benchmark for other schools that are not efficient for the improvement of academic performance.

School is the institution under the administration of the government of Republic of Indonesia. Input involved in this study was the number of teacher , number of students and the number of classroom . If the use of the input based orientation was being used, then the school had to reduce all of the inputs involved to achieve technical efficiency. The findings showed that the teachers were bound by an agreement with the government. Their employment status is permanent. The school was not allowed to take an arbitrary action to fire them in order to reduce the input to achieve the efficiency. Also, school wasn't allowed to reduce amount of classroom because it is one of the facility offered by the school and be one of the consideration for parents to enroll their child at the school. However, the number of students can be written down in order to achieve technical efficiency. This is because, the school has the right to determine the required number of students in their schools with Department of Education guidelines.

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