TREND ANALYSIS BASED EDUCATOR PLANNING
Case Study: Madrasah Aliyah Amanatul Ummah, Pacet, Mojokerto

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Abstract
Many cases show that the condition of existing resources will cause problems for every educational institution. There are two possibilities; (1) If the number of teachers is lower than the ideal number, and (2) If the number of existing teachers exceeds the ideal number needed. Therefore, each institution must plan teacher needs with a scientific approach, both qualitative and quantitative. This study aims to plan teacher needs for the 2018/2019 school year at the International Standard Madrasah, Amanatul Ummah, Pacet, Mojokerto, East Java. The teacher planning used in this study is a trend analysis predicting the number of new students in 2018/2019 which will then be the basis for determining the number of study groups. Based on the number of study groups, it is then determined by the needs of teachers, especially those who are subject to national testing. The results showed that the composition of the teacher was needed, based on the basic and current needs of the trend analysis.

Keywords: Trend analysis, educators, teachers

Abstrak

Kata Kunci: Trend analysis, tenaga pendidik, guru

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INTRODUCTION

There is an adage saying that in every effort to achieve goals depends on 5 M, namely Money (capital), Man (human), Machine, Material, and Management (governance). This will be easily understood by anyone that all activities require capital to finance various needs in order to realize the goals. In order to ensure that all organizational activities are carried out properly, an effective management system is needed. The interesting thing is that many parties agree that human (Man) is the most important factor among the 5 M. Of course, what is meant is human quality as an advanced factor in various activities to achieve organizational goals. It can be explained that a qualified human being (Qualified Man) will be able to access capital (Money) from the owner of capital. The good quality human beings will be able to create the machines needed in various activities to produce targeted products or services. Likewise, quality human beings will have no difficulty in obtaining raw materials as a factor of production to create products and services. Finally, a qualified human will design, implement and develop governance for the overall activities of the organization effectively and efficiently. For example, Microsoft companies engaged in information technology have become world business giants due to the company’s specific advantages in the form of the results of human thought in creating various application programs. In addition, other multinational corporations (MNC), such as Google, YouTube, and Alibaba become big because of the excellent people owned by the company.

This fact shows that the key factor of a prosperous nation is the quality of good education in order to produce excellent human resources. How can a good education produce quality students? In general, the quality of education is determined by the curriculum, syllabus, learning facilities, learning methods, teaching staff, education staff, performance evaluation and performance standards, and leadership. Meanwhile, the Organization for Economic Cooperation and Development states that "teacher is the single most important school variable influencing student achievement." Based on this statement, each educational

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institution must have qualified teachers in their fields and sufficient numbers, in addition to other variables to produce excellent graduates⁹.

Therefore, all levels of education starting from pre-school to higher education, may not be hasty in recruiting educators¹⁰, but must be planned properly so that the implementation of education runs as expected¹¹. Human resource planning can be done by using a variety of scientific approaches built from various theories. However, educational institutions in Indonesia generally do not carry out planning recruitment of educators through a scientific approach with various backgrounds or causes¹². Therefore, this study offers an alternative offer of planning for education personnel based on scientific approaches on a theoretical and practical level.

FORMULATION OF THE PROBLEM

Human resources are the determining variables in the success of a country's development. It is said by Monica Belcourt, Kenneth McBey, Ying Hong, and Margaret Yap¹³, among others "... there is a growing acknowledgment that the strategic management of people within the organization affects important organizational outcomes".

Thus, managing human resources (HR), including starting from planning, implementing, monitoring and evaluating HR must be done optimally in order to be able to realize the goals of the organization. Therefore, the formulation of the problem in this research is how the planning of educators based on scientific approaches is built from various theories? Referring to the formulation of the problem, the study aims to analyze the planning of educators through a scientific approach as an alternative for educational institutions to meet their needs.

THEORITICAL REVIEW

Human Resource Planning

In management science, it is known an adage "Failing to plan is planning to fail" meaning: (1) failure to make a plan is planning to fail, (2) a plan must be prepared as best as possible to avoid failure, (3) everything must be planned well in advance, and (4) without a plan, then it is likely to fail. Therefore, in order to guarantee resource requirements as expected, the organization must carry out optimal human resource planning. According to

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Monica Belcourt, Kenneth McBey, Ying Hong, and Margaret Yap: ... every human resource policy and practice must directly support the organization's strategy and objectives.

It was further said that adjusting strategic human resources policies with organizational strategic policies could be carried out in the following ways: (1) starting by formulating organizational strategies, then designing human resource strategies, (2) or vice versa, starting from an inventory of human resource competencies existing, then formulating corporate strategies based on these competencies, and (3) doing a combination of the two in a reciprocal relationship. For more details, as seen in the Figure above.

Based on Figure 1 above, it can be explained as follows: 1) The first step is to formulate an organization's strategic plan. The organization's strategic plan development must pay attention to how quality, competence and how many human resources are available. 2) Next, formulate an HR strategic plan linked to the organization's strategic plan. It means the HR strategic plan is one of the efforts or steps to ensure the achievement of the objectives of the organization's strategic plan. 3) To ensure the activities running well in order to achieve organizational goals, an estimate of HR needs and availability of HR are determined, which are then compared to produce three possibilities, namely: a) Total HR needs = total HR availability, so the organization does not take any action on the strength and formation of HR/. b) Excess of human resources, so that in the context of efficiency and savings, the organization carries out various policies, including reducing work hours, implementing early retirement programs, implementing downsizing policies, and laying off employees. c) Lack of human resources, organizations must recruit human resources, outsourcing, or select new employees.

Figure 1: General Process of Human Resource Planning.

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14 Belcourt and McBey, 40.
Human Resource Planning Process

In general, the process of human resource planning as presented in Figure ... However, human resources planning includes the following stages (Belcourt). 1) Job Analysis. 2) The Human Resources Forecasting Process 3) Determining HR Demand. 4) Ascertaining HR Supply.

Benefits of Human Resource Planning

As stated earlier, strategic human resource management has a significant impact on organizational achievements, such as the ability to survive, profits, stakeholder satisfaction, and the performance of employees themselves. Therefore, good human resource planning will produce benefits for the organization both financially and in other forms.

It is important to remember that there is an adage "only companies that have employees who really have the required competence (the right people), who are assigned to the right place of work (the right place) at the right time to carry out tasks and obligations and responsibilities that match (the right work) with effective work procedures (the right procedure) will achieve success in achieving its objectives. It is supported by research conducted by Fanny Yuk Fun Young\(^ {15} \) on small and medium-sized companies in Hong Kong with the result that human resource management has a significant positive correlation to company success.

Teachers

According to the Standard Encyclopedic Dictionary teachers are ".. one whose occupation is to teach others" Based on the Law of the Republic of Indonesia Number 14 of 2005 concerning Teachers and Lecturers Article 1 Paragraph (1) educators or teachers is professional with the main task of educating, teaching, guiding, directing, training, assessing, and evaluating students in the education of children in the age of formal education, basic education and secondary education. In this case what is meant by the professional principles of the teacher are: 1) having talents, interests, soul calling, and idealism; 2) having a commitment to improve the quality of education, faith, piety and noble character; 3) having academic qualifications and educational background according to the field of work; 4) having the competencies required in accordance with the field of duty; 5) having responsibility for carrying out professional tasks; 6) obtaining an income determined in accordance with work performance; 7) having the opportunity to develop professionalism in a sustainable manner by lifelong learning; 8) having guaranteed legal protection in carrying out professional duties; and; 9) having a professional organization that has the authority to regulate matters relating to the professionalism of teachers.

In article 8 of the law above teachers must have academic qualifications, competencies, educator certificates, physically and mentally healthy, and the ability to realize national education goals. Academic qualifications are obtained through higher education undergraduate programs or four diploma programs. Meanwhile, what is meant by competency is covering

\(^ {15} \) Fanny Yuk Fun Young, The Impact of Human Resource Management on Small and Medium Enterprise Success in Hong Kong\(^ {15} \), The Open Area Studies Journal 2, no. 1 (19 November 2009), https://benthamopen.com/ABSTRACT/TOARSJ-2-31.
pedagogical competence, personality competence, social competence, and professional competence obtained through professional education. Whereas what is meant by an educator certificate is given to teachers who have fulfilled the requirements.

**The Role of Educators on Student Quality**

Gregory J. Palardy and Russell W. Rumberger\(^\text{16}\) state that: .. a multilevel theoretical framework that recognizes the variations in student achievement gains due to three distinct and nested levels: the school, classroom, and student level. This framework also divides the schooling process into three sequential stages, including inputs, processes, and outputs. Based on the statement above, it can be said that the implementation of education includes 3 levels, namely: the school, the classroom, and the students, each of which has stages starting from the input, processes, and the final stage is outputs.

For example at the classroom level include: (1) input stage consisting of teacher background and classroom features, (2) process stage consisting of teacher attitude and teaching practice, (3) output stage consisting of classroom outputs. Thus, it seems clear that teachers have a central role in producing quality graduates (outputs). The conclusion is in line with what is stated by the Organization for Economic Co-operation and Development (OECD) as stated in the introduction that the teacher is the most important variable in determining the success of students. This is supported by the results of research by Mojavezi, A. & Tamiz, M.P. (2012) that: ... self-efficacy has a positive influence on the students' motivation and achievement\(^\text{17}\).

Furthermore, it is reinforced by the conclusions of the results of research conducted by Unanma, A.O, Abugu H.O, Dike, R.C, and Umeobika, U.C (2013) that: .. there is a positive relationship between the teacher's academic qualification and student's academic achievement. It is supported by the results of research conducted by Basha Krasnoff\(^\text{18}\) of high schools in North Caroline that student achievement is significantly high if they are taught by teachers who are certified as instructors, recruited with a good system, have high certification scores, graduate from a well-known tertiary institution, have more than two-year teaching experiences, or have received certification from the National Certification Board.

**Educator Planning**

Human resource planning has a variety of problems that vary from one another. As an illustration, the recruitment planning of rough labor is certainly not the same as the needs of skilled workers with certain skills, competencies or expertise, and also work experience. Like the needs of skilled workers, the planning of teacher needs is the process of determining the number of teachers needed so that teachers can be met and balanced between demand and supply of teachers (Fauzan, et.al. 2017: 253). It means that if there is a shortage of teachers from ideal needs, it will lead to the duplication of teaching assignments or the provision of

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\(^\text{17}\) Ahmad Mojavezi and Marzieh Poodineh Tamiz, ‘The Impact of Teacher Self-Efficacy on the Students’ Motivation and Achievement’, *Theory & Practice in Language Studies* 2, no. 3 (2012).

teaching assignments to those who do not have competence as educators. So, education is not well implemented.

Conversely, if there is an oversupply of teachers, it creates inefficiencies that will burden the education institutions' expenditure budgets. Therefore, planning for teacher needs is part of the planning of the national education system as a whole considering that the presence of teachers is playing an important role (Sunandar, 2006). It is supported by Nurcholis and friends (2016: 19) saying that teachers are the most important factor as a determinant of successful curriculum implementation.

RESEARCH METHOD

Locus and Research Object

The object of this research is the International Standard of Madrasah Aliyah (MBI) Amanatul Ummah which is under the Amanatul Ummah Educational Foundation, located in the village of Kembangbelor, Pacet, Mojokerto Regency, East Java Province. This school organizes general education and Islamic education under the auspices of the Ministry of Religious Affairs of the Republic of Indonesia established in 2006.

Samples and Data Collection Techniques

The study did not use data of new student admission in the form of a sample but the entire population from the 2006/2007 school year to 2018/2019 as presented in Table 1 below. The data collection technique is through recording from the archives in the form of administration documents for new student admissions at the MBI AU Administrative Office.

<table>
<thead>
<tr>
<th>No</th>
<th>School year</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2006/2007</td>
<td>48</td>
<td>52</td>
</tr>
<tr>
<td>2</td>
<td>2007/2008</td>
<td>100</td>
<td>115</td>
</tr>
<tr>
<td>3</td>
<td>2008/2009</td>
<td>120</td>
<td>122</td>
</tr>
<tr>
<td>4</td>
<td>2009/2010</td>
<td>140</td>
<td>141</td>
</tr>
<tr>
<td>5</td>
<td>2010/2011</td>
<td>165</td>
<td>161</td>
</tr>
<tr>
<td>6</td>
<td>2011/2012</td>
<td>180</td>
<td>180</td>
</tr>
<tr>
<td>7</td>
<td>2012/2013</td>
<td>200</td>
<td>202</td>
</tr>
<tr>
<td>8</td>
<td>2013/2014</td>
<td>222</td>
<td>223</td>
</tr>
<tr>
<td>9</td>
<td>2014/2015</td>
<td>243</td>
<td>245</td>
</tr>
<tr>
<td>10</td>
<td>2015/2016</td>
<td>261</td>
<td>265</td>
</tr>
<tr>
<td>11</td>
<td>2016/2017</td>
<td>282</td>
<td>284</td>
</tr>
<tr>
<td>12</td>
<td>2017/2018</td>
<td>301</td>
<td>305</td>
</tr>
<tr>
<td>13</td>
<td>2018/2019</td>
<td>348</td>
<td>352</td>
</tr>
</tbody>
</table>

Source: Data Documentation Amanatul Ummah

Teacher Planning Approach

The research uses a trend analysis approach outlining three stages as follows, Stage (1) Determining the straight line equation of the trend of new student admissions from many
approaches to human resource planning (the teachers). Trend Analysis is a quantitative approach trying to predict the human resources needed by extrapolating from historical changes from one or more indicators or parameters of an educational institution.\(^{19}\) Here, indicators or parameters are the number of new student enrollments from 2006 school year to 2018.

Statistically, trend analysis describes the movement of changes according to a straight line pattern (a linear trend) so that the equation of the line is: \(Y = a + bt\), where \(Y\) = the projected value of the number of new students, \(a\) = intercept, \(b\) = slope, and \(t\) = time value in this case the school year. Formulations for calculating the values of \(a\) (intercept) and \(b\) = slope of the trend line are:

\[
\begin{align*}
    a &= \frac{\sum Y}{n} - b \frac{\sum t}{n} \\
    b &= \frac{n(\sum tY) - (\sum t)(\sum Y)}{n(\sum t^2) - (\sum t)^2}
\end{align*}
\]

The next research phase is, Stage (2) Calculating the predicted number of new students. Using the trend straight line equation, we can calculate the estimated number of new students in the next school year, 2018/2019 and so forth. Whereas Stage (3) Calculating the estimated teacher needs. After getting the estimated number of new students in the 2018/2019 school year, then the number of study groups is calculated starting from class X up to class XII. Based on the number of classes, the teacher needs are calculated, especially for those who are subjected to a nationally tested subject, the Computer Based National Examination (UNBK).

**FINDINGS AND ANALYSIS**

The findings in step (1) Determining the straight-line equation of the trend of new student admissions can refer to the data in table 1 above and then separate between male and female student admissions. Figure 2 below shows the number of new students as the dependent variable \((Y)\) while the order of year values as an independent variable \((t)\). By using a statistical program, a regression coefficient can be obtained between the independent variable \((t)\) and the dependent variable \((Y)\) as in Figure 2 below.

\(^{19}\) Belcourt and McBey, *Strategic Human Resources Planning*, 141.
Based on the data in Table 1, Figure 2 and Figure 3, the linear trend equation is written as follows:

New student admissions (Male): \[ Y = 22,055x + 46.39 \] (1)

New student admissions (Female): \[ Y = 21.874x + 50.50 \] (2)

By referring to the results above, the next step is Stage (2) calculating the prediction of the number of new students. By using equations (1) and (2) above, the prediction of the number of students in 2019 to 2024 can be calculated as follows.
Table 2. Prediction of the number of new students 2019-2024

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Putra</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>17</td>
<td>18</td>
<td>19</td>
</tr>
<tr>
<td>Putri</td>
<td>355</td>
<td>357</td>
<td>377</td>
<td>379</td>
<td>399</td>
<td>400</td>
</tr>
</tbody>
</table>

Putra: Male
Putri: female

Based on the data of new students admission from 2006 to 2018 (Table 1) and the results of the calculation of predictions of new students admission in Table 2, it can be seen that there was a significant jump from 2017 to 2018, where the previous pattern of adding new students was around 20 students only male and 20 students for female, but in 2017 towards 2018 there were additional 50 students for female and 50 students for male.

The inconsistency of this pattern should have an impact on the calculation of new student estimates, so that the linear equations 1 and 2 can actually change constantly, a little bit difficult to predict. The current trend is around 20-40 students, but if there is a significant spike such as in 2017 towards 2018, there could be a constant trend of around 40-100.

While stage 3 is calculating the estimated teacher needs. Based on the predicted results of new students admission for the 2019 school year, we can calculate the number of study groups until 2024. Furthermore, the number of these classes are used to calculate the estimated number of subject teachers tested nationally, as presented in Table 3 below.

Table 3. Estimated Number of Subject Teachers Nationally Tested Academic Year 2019 to 2024

<table>
<thead>
<tr>
<th>Tahun</th>
<th>Murid</th>
<th>Kelas</th>
<th>Matapelajaran</th>
<th>Guru</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Math/Indonesia/Inggris/Biologi/Fisika/Kimia</td>
<td></td>
</tr>
<tr>
<td>2019/2020</td>
<td>756</td>
<td>30</td>
<td>15/6/6/10/10/10</td>
<td>57</td>
</tr>
<tr>
<td>2020/2021</td>
<td>800</td>
<td>32</td>
<td>16/6/6/11/11/11</td>
<td>61</td>
</tr>
<tr>
<td>2021/2022</td>
<td>844</td>
<td>34</td>
<td>17/7/7/11/11/11</td>
<td>64</td>
</tr>
<tr>
<td>2022/2023</td>
<td>888</td>
<td>36</td>
<td>18/7/7/12/12/12</td>
<td>67</td>
</tr>
<tr>
<td>2023/2024</td>
<td>932</td>
<td>37</td>
<td>19/7/7/12/12/12</td>
<td>71</td>
</tr>
<tr>
<td>2024/2025</td>
<td>975</td>
<td>39</td>
<td>20/8/8/13/13/13</td>
<td>74</td>
</tr>
</tbody>
</table>

DISCUSSION AND LIMITATIONS

By knowing the prediction of the number of additional needs of subject teachers tested nationally, the school can early recruit new teachers well through a rigorous selection phase. Thus, the school will get new teachers beyond the competency standard in general and produce competitive graduates to continue their studies (Basha Krasnoff: 2014).

Human resource planning through trend analysis is one of the alternatives to the relatively simple quantitative approach. It is one of the limitations in this research. In this case, another alternative is regression analysis considering various fundamental factors affecting the number of new students which are then used as a basis for determining the number of teacher...
needs. These factors include: number of junior high school / madrasah tsanawiyah graduates in the region, community income, inflation rate, number of high school / madrasah aliyah recently opened in the area, number of school fees, school rank, transfer students, students dropped out, the government policy in the process of dividing into administrative districts. Of new student admissions (Rayon), the school's policy regarding the quota of new students, and other various factors. In addition to the limitations mentioned above, the research only focuses on planning the needs of subject teachers tested nationally, it should be done to the needs of teachers of all subjects. Because the International Standard Madrasah (MBI) Amanatul Ummah is an educational institution under the auspices of the Amanatul Ummah Islamic Boarding School, it will be complete if the planning of human resources includes the Islamic teaching staff.

In addition to the limitations as stated in point (b) above, the study also uses the assumption that: MBI Amanatul Ummah has no constraints in the form of limited teaching and learning facilities, such as; the availability of classrooms, laboratories, libraries, the presence and capacity of student dormitories and places of worship. Thus, the opportunity to add 450 male and 450 female students is still widely open. Besides, the International Standard Madrasah (MBI) Amanatul Ummah does not have a quota policy for adding new students lower than the number of new students based on the results of calculations in this study.

CONCLUSION

Through good teacher need planning, a balance will be created between the number of demand and supply of teachers. The institution avoids the possibility of a shortage of teachers which has a negative impact on the learning process or the excess of teachers bringing about a consequent swelling of the expenditure budget. The institution's operations become inefficient. Therefore, to avoid these problems, every educational institution should meet the needs of teachers by planning existing scientific approaches, both quantitative and qualitative in nature, not based on intuition filled of uncertainty.

REFERENCES


