Design and Development of New Teacher Qualify (NTQ) Application Qualification with Rule Based Classification Methods in Informatics Engineering Teacher West Sumatera

Rusdinal, Kasman Rukun, Asrul Huda, Ary Ramadhan

Abstract: New teacher qualified is qualities of new teacher who will spearhead of national education in achieve national education goals. Informatics Engineering Teachers have three different concentrations, namely Multimedia, Software Engineering and Computer Network Engineering. To find out concentration of Informatics Engineering Teachers, needed an application that can qualifity Informatics Engineering Teachers into three concentrations with classification method that has been tested by experts. The qualification application is build by used Rule Based Classification method which is able to qualify the Informatics Engineering Teacher with Rule criteria that have been applied. Development of website-based applications with Codeigniter Framework Version 3. The results of this application design is produced an application that can be run by Local Area Network (LAN) facilities which will be developed online-based on the future.

Index Terms: NTQ, Informatics Engineering Teacher, Classification, Rule Based Classification, Codeigniter Framework

I. INTRODUCTION

A. Background

Education is one of determinants successful development of human resources in an effort to improve live standard a nation into a civilized and cultured nation. The purpose of national education is to educate lives of nation and develop Indonesian people, namely human beings who have faith and devotion to God Almighty, have noble character, have skills and knowledge, have a strong personality, are independent, physically and mentally healthy, and have high responsibility for community, nation and state [1]. Education will make humans develop their potential so that they can confront with any changes that occur to progress of science and technology.

Based on the Teacher and Lecturer Law [2] Professionals are jobs or activities carried out by a person and become a source of income that requires expertise, skills that fulfill quality standards or norms and require education profession. Various ways have been pursued by government to fulfill the law on national education standards, especially increasing the Teacher professionalism. Among them are the efforts carried out by the implementation of UKG (Teacher Competency Test). But in reality, after UKG was implemented, the results obtained were unexpected. According to data obtained by Tribunnews.com: 2013, it turned out that average UKG results in 2013 throughout Indonesia were only 4.25. Even though there is value 8 or 9. But the average only 4.25. In 2015, based on the results of second UKG period, the average UKG results were also not with expectations, with a national average of 53.02 obtained from the Directorate General of Teachers and Education Personnel, Ministry of Education and Culture 2015. These results are certainly very apprehensive and big question for education policy makers in Indonesia.

Table 1. National UKG Result in 2015

<table>
<thead>
<tr>
<th>No</th>
<th>Province</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Aceh</td>
<td>45.27</td>
</tr>
<tr>
<td>2.</td>
<td>Bali</td>
<td>55.92</td>
</tr>
<tr>
<td>3.</td>
<td>Bangka Belitung</td>
<td>55.1</td>
</tr>
<tr>
<td>4.</td>
<td>Banten</td>
<td>52.2</td>
</tr>
<tr>
<td>5.</td>
<td>Bengkulu</td>
<td>50.5</td>
</tr>
<tr>
<td>6.</td>
<td>DI Yogyakarta</td>
<td>62.36</td>
</tr>
<tr>
<td>7.</td>
<td>DKI Jakarta</td>
<td>62.36</td>
</tr>
<tr>
<td>8.</td>
<td>Gorontalo</td>
<td>48.8</td>
</tr>
<tr>
<td>9.</td>
<td>Jambi</td>
<td>48.69</td>
</tr>
<tr>
<td>10.</td>
<td>Jawa Barat</td>
<td>55.15</td>
</tr>
<tr>
<td>11.</td>
<td>Jawa Tengah</td>
<td>58.36</td>
</tr>
<tr>
<td>12.</td>
<td>Jawa Timur</td>
<td>56.71</td>
</tr>
<tr>
<td>13.</td>
<td>Kalimantan Barat</td>
<td>50.28</td>
</tr>
<tr>
<td>14.</td>
<td>Kalimantan Selatan</td>
<td>53.14</td>
</tr>
<tr>
<td>15.</td>
<td>Kalimantan Tengah</td>
<td>48.23</td>
</tr>
<tr>
<td>16.</td>
<td>Kalimantan Timur</td>
<td>52.3</td>
</tr>
<tr>
<td>17.</td>
<td>Kalimantan Utara</td>
<td>51.95</td>
</tr>
<tr>
<td>18.</td>
<td>Kepulauan Riau</td>
<td>54.72</td>
</tr>
<tr>
<td>19.</td>
<td>Lampung</td>
<td>49.75</td>
</tr>
<tr>
<td>20.</td>
<td>Maluku</td>
<td>44.57</td>
</tr>
<tr>
<td>21.</td>
<td>Maluku Utara</td>
<td>41.96</td>
</tr>
</tbody>
</table>

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Based on Table 1, National UKG Results in 2015, national average is 53.02 was obtained from national target by government is 55.00. It shows that the lack of teacher competence in National needs to be improved in order to achieve national learning goals.

The UKG that is carried out is based on expertise area proposed by the Teacher. Submissions made by the teacher have been based on teacher's educational background, but specifically in case, Teacher of Informatics Engineering, Teacher educational background of Informatics Engineering cannot qualify Master's areas of expertise into three concentrations, namely the concentration of Multimedia, Software Engineering and Computer Network Engineering.

The reason Informatics engineering Teachers wrong in proposing expertise areas during UKG process because there is no scientific qualification to qualify Informatics Engineering Teachers into three areas concentration in Information Engineering. When Informatics Engineering Teachers propose wrong concentration while following UKG, it will have an impact on low results of UKG Teachers Informatics Engineering who contribute to disparage results of nationally UKG.

B. Problems

As the problems that can be formulated, among others, there is no qualification feature concentration of Teacher Informatics Technique one existing UKG program, there is no specific application of teacher qualification Informatics Engineering in three areas concentration, Informatics Engineering Teachers have not been qualified scientifically, Teachers Informatics Engineering does not teach according to concentration.

C. Objectives

The purpose designing this application is to produce an Informatics Engineering Teacher qualification program based on three concentrations, namely: Computer Network Engineering, Software Engineering and Multimedia.

II. THEORETICAL

A. Teacher

Teachers are professional educators with the main task of educating, teaching, guiding, directing, training, evaluating and evaluate students in early childhood education through formal education, basic education and secondary education. [2].

B. New Teacher Qualified (NTQ)

Quality of new teacher is called Beginner Teacher who has appropriate qualifications and competencies. Under the National Education Minister Regulation No. 27 of 2010 concerning Induction Program for Beginning Teachers, “Beginner teachers are teachers who are first assigned to carry out the process of learning / guidance and counseling in education units organized by the government, local government, or community”

C. Teacher Competency Test (UKG)

According to Oemar Hamalik [5] there are several types of competencies that must be fulfilled as full of people can be said as a teacher. Competency test Teachers are testing those requirements again with several testing criteria that have been determined and matched with competency standards that are teacher's prerequisites and are mastering by Teacher.

D. Informatics Engineering Expertise

In 8 national education standards there is one of ICT Teacher competency standard. This national education standard regulates about minimum achievement in Indonesian. National competency standards Informatic engineering teacher are regulated by Minister of National Education Regulation No. 16 of 2007 about Academic Qualification Standards and Teacher Competencies [6].

E. Rule Based Classification Method

Rule based classification is a classification method that stores and manipulates knowledge to be realized in solving classification problems by using rules that have been set before.

III. ANALYSIS AND DESIGN SYSTEM

System analysis is describing activity information system in completely and real into components that aim to identify and evaluate the problems that arise, thus leading to solution for improvement and development in direction more better and in accordance with needs.

Process analysis is carried out to analyze the process that will be developed and implemented into teacher qualification application. This analysis needed to ensure that all steps of process run in order specified. There is the flowchart of the qualification application process flow.
Fig. 1. Flowchart of the Qualification Application Process

Analysis of this design describes user relationship with the system that was developed to explain data and information was sent as a response between the user and the system developed. The design of the description of this relationship is shown in the following diagram context

Fig. 2. Context of the Qualifying Application Diagram.

Fig. 3. User Case of Qualification Application

The user case diagram above explains all actors involved in system design. The diagram show relationship between all actors, the relationship between actors and actors, and actors with the system, all of them are linked with databases relations between actors and systems such as images

Fig. 4. ERD Qualification Application

ERD in Fig. 4 illustrates the relationship of each table and its entities.

The following are some of the application display designs, starting with application's initial page design.

Fig. 5. Main Page Design

The next design is continued with the drafting of Teacher registration page, this page will be a form for registering teacher data.

Fig. 6. Teacher Registration Page Design

After registration process, Teacher is allowed to do a test to see mapping, so it is necessary to design the Teacher’s test page, as well as the design of the Teacher’s exam page.
Design and Development of New Teacher Qualify (NTQ) Application Qualification with Rule Based Classification Methods in Informatics Engineering Teacher West Sumatera

The main page is the main page that each user encounters when opening website page for information system in New Teacher Qualified (NTQ) Qualification Application for Informatics Engineering Teachers in West Sumatra.

The main page views:

![Main Page Display](image)

**Fig. 7. Main Page Display**

To display the image on main page, used following html and php script:

```html
<div class="carousel-inner">
<?php $no=1; foreach ($slider as $rows) { ?>
<div class="item <?php if($no==1){ echo "active";} ?>><?php echo $rows->image; ?></div>
<?php } ?></div>
```

**Fig. 8. Design of Teacher’s Test Result Page**

Fig. 8 shows the data that will be displayed on the test results page, the data displayed is in form of Teacher personal data and details of test results.

**IV. RESULTS AND DISCUSSION**

The main page is the main page that each user encounters when opening website page for information system in New Teacher Qualified (NTQ) Qualification Application for Informatics Engineering Teachers in West Sumatera.

The controller used to display the user's home page is as follows:

```php
public function index()
{if ($this->session->userdata('level')=='Admin')
{$data['title'] = "Selamat Datang | New Teacher Qualified";
$data['page'] = "Selamat Datang";
$this->load->view('home/header',$data);
$this->load->view('home/view_home',$data);}
```

The Teacher's page is the page used by the admin to display Teacher data, on this page the admin can also add, edit and delete Teacher data. The following is the Teacher page display.

![Teacher's Test Page Design](image)

**Fig. 7. Teacher's Test Page Design**

Following is test results page design and the results of the teacher qualification.

![Login page Display](image)

**Fig. 8. Login page Display**

To display login page, use the following html and php script:

```html
<div id="login-page"><div class="container">
<form class="form-login" id="form" method="post" action="<?php echo base_url(); ?>login/auth"><h2 class="form-login-heading">sign in now</h2><div class="login-wrap">
<div id="result"></div>
```

**Fig. 9. Home User Pages**

The user page is the page that user encounters after logging. The appearance of user page after the user has logged in is as follows.
To display Teacher page used controller as follows:

\[
\text{public function Guru()}
\]

\[
\{ \text{$data['title'] \text{= "Data Guru \ New Teacher Qualified"};} \}
\]

\[
\text{this->load->view('admin/view_Guru',$data);}
\]

Pages add questions are pages used by admin to add exam questions. This question-added page consists of 3 different pages, a Multimedia question page, RPL questions and TKJ questions. On this page admin inputs problem data, answer data, answer key along with value of the answer. The following page view of adding questions.

The test results page is display used script controller as follows:

\[
\text{if($this->session->userdata('level')=='Guru')}
\]

\[
\text{[$data['title'] = "Detail Ujian \ New Teacher Qualified"; $data['page'] = "Detail Ujian"; this->load->view('home/header',$data);}
\]

The test results page is the page that displayed to teacher when they have finished they test. The views page as follows:

The test report page is a page used by the admin to view reports of all Teacher's test results based on the test schedule that was followed. This page brings up data on report of teacher name who took test, the time of the test, value details and concentration of mapping results. The following is the page view of the test results report.

The following is the script used to display the Teacher's test results report page:

\[
\text{public function hasil_ujian()}
\]

\[
\{ \text{if($this->session->userdata('level')=='Admin")} \}
\]

\[
\text{[$data['title'] = "Hasil Ujian \ New Teacher Qualified";}
\]

\[
\text{this->load->view('admin/view_jadwal_hasil',$data);}
\]

\[
\text{this->load->view('home/footer');}
\]

The following is page for Teacher's test:

The test results page is the page that displayed to teacher when they have finished their test. The views page as follows:

\[
\text{if($this->session->userdata('level')=='Guru')}
\]

\[
\text{[$data['title'] = "Detail Ujian \ New Teacher Qualified"; $data['page'] = "Detail Ujian"; this->load->view('home/header',$data);}
\]

\[
\text{this->load->view('Guru/view_hasil_ujian',$data);}
\]

\[
\text{this->load->view('home/footer');}
\]

The following is page for Teacher's test:
V. CONCLUSION

Based on the Design application results of New Teacher Qualified Qualification Application for Informatics Engineering Teachers in West Sumatra, it can be concluded that with design and development of this application, it can help qualify beginner teachers of Information Engineering based on concentration, qualifying Information Engineering teachers into three concentrations of Informatics Engineering, namely: Computer Engineering Network, Software Engineering and Multimedia.

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REFERENCES


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Rusdinal is a researcher with a background in educational administration. Current position is the chair of the research and community service institution (LP2M).

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Asrul Huda is a researcher with a background in Computer Science. The focus of the research that is often carried out is the fields of multimedia, graphic design, information technology and vocational education.

Ary Ramadhan is a student who helped with this research activity. The focus of the research conducted is the development of information systems.