Design of Application Thesis Detector for Student of Mathematics Education Department of IAIN Palopo

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Abstract: This research is aimed to design the application of thesis title of Mathematics Education Department of Institut Agama Islam Negeri (IAIN) Palopo. The caused by the management of thesis title is still manually, not based on the characteristics of the thesis that has been there and the development of the concept of Mathematics Education research. Applications designed based on Microsoft Visual Studio that will be able to provide information to students about research topics so often that the system will suggest taking another research topic. The data is thesis research of Mathematics Education Department from 2013 until 2017. The information is then tabulated based on the type (Quantitative, Qualitative, Classroom Action Research, Research Development, and Field Research), the focus of research (learning outcomes, learning motivation, model/ method/ approach/learning strategy, and other variables), and research location. The designed application works well. The result is that the students of Mathematics Education Department most often do quantitative research with the focus of research in learning outcomes of mathematics. SMP Negeri 8 is the location most often used. The design of the application allows two things: the title is accepted and can continue as research or title is rejected and recommended for other titles

1 INTRODUCTION

Students should take research titles that have novelty. Moreover, the Department of Mathematics Education of IAIN Palopo is influenced by mathematics, education, and Islamic content. Students should be able to propose a variety of research titles

To guarantee the quality of student research, this study tries to design a thesis detector application that can be used to detect the title of research to be taken by students. It will be seen whether the title of the research has novelty or not based on existing research. Application design is done using Microsoft Visual Studio.

There are few studies applied Social Network Analysis (SNA) to see the relationship between each research topic (Chen et al., 2016), analyze research trends in competition (Jeon et al., 2016), investigate the evolution trends of network structure of learners within a course forum in a university' online learning platform (Liu et al., 2018) or investigate research trends based on content analysis (Erdogan, 2015).

The other studies tried to find out the research trends in Environmental Education in Korea. This research shows that the author suggests that the range of practices in environmental education has changed. This result by comparing article was published in the early 2000s and 2010s (Kim, 2017). A content analysis was implemented to describe and quantify the methodology trends in the published articles in 2005-2015 in 15 journals indexed by Turkish Academic Network and Information Center(Akdemir and Yagiz, 2016). The others used scientometric methods to analyze trends of science education research from four journals from 1990 to 2007. This study found that the research topic of Conceptual Change & Concept Mapping was the most studied topic. This study also finds that embedded in the most cited references, the supporting disciplines and theories of science education research are constructivist learning, cognitive psychology, pedagogy, and philosophy of science (Chang et al., 2010).

This research provides a descriptive content analysis of thesis topic were published between 2013 to 2017. This study is valuable and different from previous studies in two aspects. First, this research provides a descriptive of thesis topic by type of research, focus, and research location. Secondly, this research designs an application Thesis Detector to

find out the similarity and providing recommendations about the title of research that should be taken.

2 THE INTRODUCTION OF THESIS DETECTOR

The management of the title proposal in the Department of Mathematics Education has been done manually. As a result, sometimes several titles have almost the same topic. Standard Operational Procedure (SOP) submission of titles in the Department of Mathematics Education can be seen in Figure 1.

Figure 1: SOP Submission of Titles in the Department of Mathematics Education.

Based on Figure 1, activities two and three are carried out manually. It results in staff and faculty not having a proportional time to do other work. Whereas currently, less than 1% of students aged 15 years and over say they have never used a computer (OECD, 2010). That is, most students are already familiar with computer-based management. Also, academic information systems can improve the effectiveness and efficiency of school educational management (Purwanto, 2017), with records of software, hardware, and human resources must meet standards (Prasojo, 2006)

The application designed in this study can later be used by students, staff, and head of the Department of Mathematics Education to document the research title while maintaining the novelty of the student's research. In the end, the management of the title of the research in the Department of Mathematics Education will be based on computer assessment. This can motivate students because the assessment process involves the advancement of information and technology. The ability to utilize motivates student skills and involve them as a stakeholder can often result in more efficient and cost-effective successes

unattainable by faculty, staff, and administrators alone(Myers et al., 2018).

The object of this research is all the title of the thesis of the student of the Department of Mathematics Education starting from 2013 to 2017. The object then becomes a database in the thesis detector application. The instrument is documentation of student research titles. Each research title then tabulated based on (1). Types of research: quantitative, qualitative, classroom action research, development research, and field research, (2). The focus of the research is the keywords of each research, and (3). Research location.

Thesis detector application is designed using Microsoft Visual Studio version 10. How the application works as shown in Figure 2.
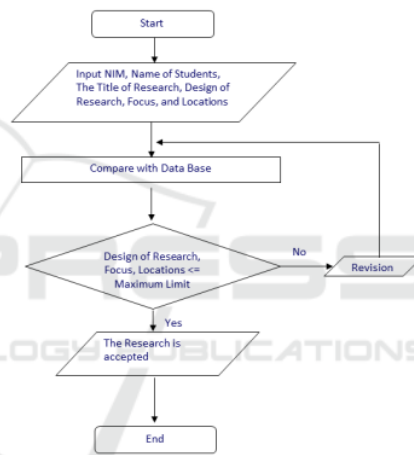

Figure 2: Flow Chart of Thesis Detector.

3 RESULT AND ANALYSIS

3.1 Summary of Type, Focus, and Research Location

The results showed that the thesis research title of the Department of Mathematics Education from 2013 to 2017 amounted to 356 research titles. Of this amount, the type of research that is most widely carried out is quantitative research. The most important research focus often raised is the problem of learning outcomes, cooperative learning models, and learning motivation. Junior High Schools (SMP) are the most frequently used research locations. More about the results can be seen in Figures 3, 4, and 5.
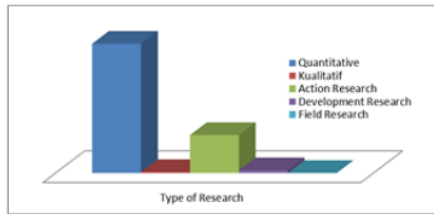
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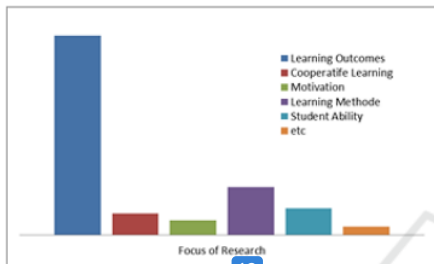Figure 3: Number of Type of Research in the Department of Mathematics Education IAIN Palopo.

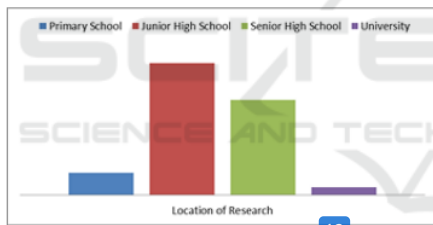Figure 4: Number of Focus of Research in the Department of Mathematics Education IAIN Palopo.

Figure.5: Number of Location of Research in Department of Mathematics Education IAIN Palopo.

This research showed that the top two research topics in the department of mathematics education are quantitative and action research. This result is similar to Oktay research which the research design trend of the published articles in ELT is quantitative research (Akdemir and Yagiz, 2016). This is because math is related to numbers. In some cases, mathematics students tend to experience limitations in describing a phenomenon or event. the negative impact is that the research topics studied tend to be monotonous

Top two focus of research in the Department of Mathematics Education IAIN Palopo is learning outcomes and cooperative learning. This result is more or less similar to (Gul and Sozbilir, 2016). This is because students are still thinking too practical. Students have not identified other problems besides

learning outcomes problems. They argue that cooperative learning models can solve the problem of learning outcomes in general.

The most research location is junior high school. It similar to (Gul and Sozbilir, 2016). This is because the profile of graduates of the department of mathematics education IAIN Palopo is to come a teacher who can solve problems at junior and senior high school.

3.2 Designing Application Thesis Detector

The database in this application is all the title of the thesis of Department of Mathematics Education starting from 2013 to 2017. Microsoft Visual Basic designed the application. The maximum limit is 20% of the amount of data available in each category. This amount will change and be adjusted for each graduation period.

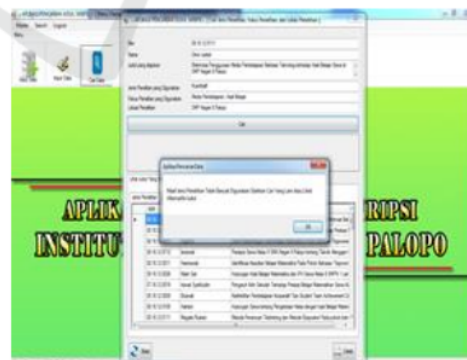Figure 6: Home Interface of Application Thesis Detector.

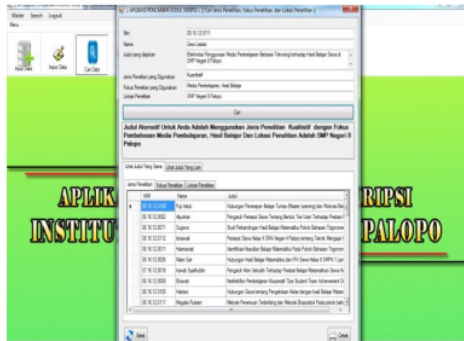Figure 7: The Command Window if The Research Rejected.

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Figure 8: The Alternative Research Title Suggested by Application.

The function of the application was tested by the black box testing method. The working principle of this method is only to check the functionalities of the application. The test results can be seen in Table 2 below:

Table 2: The Test Results by Black Box Methode.

No	System Function	Test Item	Result
1	Rejection of thesis title	▪ Login user ▪ Input design of research, focus, & location > sum of database	▪ Succeed ▪ Succeed
2	Accepted of thesis title	▪ Login user ▪ Input design of research, focus, & location < sum of database	▪ Succeed ▪ Succeed

Students and admin can use this application. The application works based on the comparison of the input given to the existing database based on the type of research, focus, and location of the study. The system will provide a "Research Title Denied" recommendation if one of the three categories passes the maximum amount. If not, the system will give a comment "Research Title Received: which means it can be followed up to become research.

4 CONCLUSIONS

This research has described the state of the title of the student's research based on three categories, namely the type of research, focus, and location of the study. Quantitative research is the type of research that is most often carried out by students, while the most frequent research focus is on learning outcomes. SMP is the most research location, in this case, SMP Negeri 8 Palopo. The application to detect and provide recommendations on the title of the research has been designed using Microsoft Visual Studio. This application will work based on a database that must be updated regularly following the graduation period. The development of this application is still very possible by expanding categorization and improving its decision-making system.

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