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Abstract: The purpose of this study was to determinate location of MBKM internship based on clusterring student's skills with K-Means. This is important to detect some of student's skills which will become the output of the university that must be recorded early so that they were truly ready to compete. To analyze the skills of some students, the Mathematics Education study program at the University of Argopuro Jember conducted a survey of additional skills outside of lectures. This survey is carried out regularly every year as material for reporting on the development of students' skills and qualities. Thus the skills possessed by students can be monitored and evaluated whether in the future special skills were needed that must be given to students. The skills of students who become points in the survey include: 1)Foreign language skills, 2)IT Skills, 3)Public Speaking and Management Skills, 4)Analitical and Graphic Design Skills, 5)Microteaching Skills. We clustering 67 respondent, it is our student at Universitas Argopuro Jember in fiveth. Cause of outlier in 7 respondent, we just make clustering with K-means with 60 respondent. Based on K-Means clusterring we have 3 cluster .It shows that cluster 1 has 32 respondents, cluster 2 has 21 respondents and cluster 3 has 7 respondents. Abd also on the result and discussion, we knew that cluster 1 with 32 respondent has more skills, it were foreign language, public speaking skills and microteaching skills. So the internship locations that match these skills clusters such as LBB then Publication Offices such as Radio, Jawapos, etc. For second conclusion, we knew that cluster 2 with 21 respondent have more skills except for microteaching skills. Appropriate internship places for these students are in administrative offices, local government offices, etc.And for third conclusion, that cluster 3 with 7 respondent have more skills too except public speaking but they have a middle skills in microteaching. The office or internship location where we can suggest is Dinas Parawisata, Perbankan that needs good communication and good team work, etc

Keyword: Student's Skills, Internship MBKM, K-Means, Cluster

INTRODUCTION

In the era of the COVID-19 pandemic, the paradigm of the learning system is changing very quickly. Like a revolution, the face-to-face learning implementation system becomes an online learning system that requires educators to continue and develop along with technological developments. It is to meet the needeed of implementing learning and teaching activities. Basically, maintaining the quality of the teaching and learning process will affect the quality of the output produced by the graduates. The output of graduates produced must be able to compete in various sectors. The Minister of Education and Culture, Nadiem Makarim (Kompas.com,9 November 2021) , stated that 80 percent of our graduates work outside the study program. Therefore, he developed the Merdeka Campus policy as a form of development of the MBKM (Merdeka Belajar Kampus Merdeka) curriculum. Some of the policies of the MBKM curriculum include (Kompas.com, 25 Januari 2020)

1. Opening of new study programs

   This program gives autonomy to PTN (Negeri) and PTS (Swasta) to open new study programs. But this autonomy is not free. PTN and PTS must have A and B accreditation, and have collaborated with universities that were included in the QS

Top 100 World Universities. The exception is for health and education study programs. The Ministry of Education and Culture will work closely with universities and study program partners to carry out supervision. Nadiem concluded

"The tracer study must be done every year. Universities were obliged to ensure this is implemented."

2. College accreditation system

The re-accreditation program will be automatic for all ranks and voluntary for universities and study programs that were ready to rank up. Meanwhile, the accreditation that has been set by Badan Ajreditasi Nasional Perguruan Tinggi (BAN-PT), remains valid for up to 5 years but will be renewed periodically. automatic. The application for accreditation of Higher Education and Study Programs is limited to no later than 2 years after the previous accreditation.

3. Ease of becoming a PTN-BH

This policy is related to the freedom for PTN Badan Layanan Umum (BLU) and Satuan Kerja (SatKer) to become PTN Badan Hukum (PTN-BH). The Ministry of Education and Culture will simplify the requirements without being tied to accreditation status.

4. The right to study 3 semesters outside the study program

Students can take courses outside the study program and make changes to the definition of the Satuan Kredit Semester (SKS). Nadiem said in his presentation

"In addition, students can also take credits in other study programs on campus for one semester from the total semesters that must be taken. This does not apply to health study programs."

Here the definition of credit is defined as 'hours of activity', no longer 'hours of study'. The activities in question were classroom activities, internships, industrial work practices, research, independent studies, and others.

Recently, educators and structural circles in higher education raised this as a hot issue, because in its implementation there will be several courses that will experience conversion and were adjusted to learning outcomes which were the basis for MBKM as well as print graduates who were ready to work through the right to study abroad policy. study program. Detection of student skills which will become the output of the university must be recorded early so that they were truly ready to compete (Nuraini, 2017 p. 6).

To analyze the skills of some students, the Mathematics Education study program at the University of Argopuro Jember conducted a survey of additional skills outside of lectures. This survey is carried out regularly every year as material for reporting on the development of students' skills and qualities. Thus the skills possessed by students can be monitored and evaluated whether in the future special skills were needed that must be given to students (Harahap, 2019 p. 3). The skills of students who become points in the survey include:

1. Foreign language skills
2. IT Skills
3. Public Speaking and Management Skills
4. Analitical and Graphic Design Skills
5. Microteaching Skills

More demands of output produced must be able to compete in terms of ability wherever the student later works, the researchers carried out a mapping of student skills in the fiveth semester, which later this information could be used as the basis for determining the location of student internships to fulfill the MBKM curriculum.

This capability mapping uses cluster analysis with K-Means. Several forms of cluster analysis with Means have been carried out by several researchers, including by Rahayu Noveandini and Maria Sri Wulandari (2019). K – Means is a clustering algorithm that is carried out with several iterations or repetitions. The function of this algorithm is groupping data into several clusters. The characteristics of the K-Means algorithm were

1. Have n pieces of data
2. Input in the form of the number of data and the number of clusters (groups)
3. Each cluster / group has a centroid that represents the cluster.

With the mapping of skills with K-Means, it is hoped that the Mathematics Education Study Program at PGRI Argopuro Jember University will be more targeted in determining the location of internships for students in the fifth semester.

METHOD

This research is a quantitative research that is used to classify the skills possessed by Mathematics Education students at UNIPAR. The population used is the number of students in the fifth semester of the Mathematics Education study program who were active in 2021/2022. It contains 67 students in class. And also this research uses the K-Means algorithm to classify the best cluster. This best cluster is used to mapping the internship location for our curriculum in MBKM. So we can get best clusterring for best mapping location.

According to Gan (2017, p.8-12), K-Means algorithm is a clustering algorithm that groups data based on the cluster center point (centroid) that closest to the data. The purpose of K-Means is to group data by maximizing the similarity of data in one cluster and minimizing the similarity of data between clusters. The measure of similarity used in the cluster is a function of distance. So maximizing the similarity of the data is obtained based on the shortest distance between the data and the centroid point.

The initial step in the data clustering process using the K-Means algorithm is the formation of the starting point of the centroid c_j. In general, the formation of the starting point of the centroid is generated randomly. The number of c_j centroids generated corresponds to the number of clusters that were determined at the beginning. After k centroids were formed, the distance between each x_i data and the jth to k^{th} centroid is calculated, denoted by $d(x_i, c_j)$. There were several distance measures that were used as a measure of the similarity of a data instance, one of which is the Euclidean distance. Euclidean distance calculation as in equation below

$$d(Xi, Cj) = \sqrt{\sum_{}^{N}(Xi - Cj)^2}$$

Duran and Odell (1974,p.13) stated that if d (Xi, Cj) gets smaller, the similarity between the two units of observation is getting closer. The condition for using Euclid's distance is that if all features in the dataset were not correlated with each other. If there were correlated features, then use the Mahalanobis distance concept. Whereas, Agusta In Asroni (2015, p.3) states that the closest distance is sought so that the data will be grouped based on the closest centroid. The next stage is to update the centroid point by calculating the average distance of all data from the centroid. Then it will return to the initial process. This iteration will be repeated continuously until a constant centroid is obtained, meaning that the centroid point has not changed anymore. Or the iteration is stopped based on the specified maximum number of iterations.

To get the results of student's skills, a questionnaire was distributed according this Table in below :

Table 1. The Instrument of Student's Skills

Variable	Indicator
Foreign language skills (C₁)	Listening skills
	Reading skills
	Writing skills
	Speaking skills
IT Skills (C₂)	Ability to use some of information in technology
	Ability to some of softwwere in technology
	Ability to combine an Technology of Information into a working or real life
Public Speaking and Management Skills(C3)	Express an idea clearly
	Communicate effectively with diverse audiences
	Collaborate with teams on various goals
Analitycal and Graphic Desaign Skills (C4)	Analyze data
	Make interpretation of data and model
	Describe and get conclusion for data
Microteaching Skills(C5)	Skills to open and closure the lesson
	Skills to explain
	Skills for questioning
	Skills to give a reinforcement and stimulus for student

After the research data is obtained, then the data is analyzed by the following steps:
1. Testing the validity and reliability of research instruments
2. Formation of latent variables by factor analysis
3. Outlier testing
4. Classification with the k-means algorithm.

RESULT AND DISCUSSION
Validity and Reliability Testing
Validity and reliability testing was carried out on the test data, which amounted to 67 responses. Based on the test results, it is known that all the questions asked were valid because all the resulting sig values were less than 0.05 and the reliability criteria because they have a Cronbach alpha reliability value of more than 0.6 (Widoyoko, 2012)

Formation of Latent Variable
The formation of latent variables is carried out to obtain variables that represent the variables used. The formation of these latent variables utilizes factor analysis with the SPSS 17. The results of the formation of latent variables were shown in Table 2 and Table 3.

Table 2 : KMO dan *Bartlett's Test*

Var	KMO	χ^2	Sig
C1	0,782	91,902	0,000
C2	0,763	87,055	0,000
C3	0,710	126,72	0,000
C4	0,512	24,580	0,000

C5	0,621	42,364	0,000

Based on table 2, it show that all variables have a KMO's value more than 0.500 and a sig. value of less than 0.05 so that all variables can be reduced by using factor analysis.

Table 3. Initial Eigenvalues

Var	Initial Eigenvalues	
	Total	*% of Variance*
C1	2,621	52,871
C2	2,551	63,823
C3	2,713	67,800
C4	1,643	54,201
C5	1,654	55,438

The determination of the number of factors formed is carried out with the criteria that the eigenvalue obtained must be more than 1 (Widarjono, 2015). Table 3 shows that variable C1untill C2 have an initial eigen value more than 1 . Based on the results of this factor analysis, each variable is represented by 1 factor which will then be analyzed further.

Outlier Test

In cluster analysis using the K-means method, it is very vulnerable to the presence of outliers, so it is necessary to check whether there were outliers. Outlier checking is done with SPSS, the results were shown in Table 4.

Table 4 : Outlier Test

Observation	Mahalanobis Distance
17	52,566
23	48,681
15	31,860
32	31,493
63	26,132
67	25,254
12	33,587

The results of the outlier test showed that there were 7 respondents who were outliers, so these 7 respondents could not be further analyzed with K-Means.

K-means Algorithm

The classification of respondents with K-means was carried out using SPSS softwwere with the stats package for classification and the factoextra package to describe the classification results obtained. In this study, the data were further classified into 3 groups .The classification results were shown in Table 5 .

Table 5. Final Cluster Centers

	Cluster		
	1	2	3
Foreign Language Skill	3.71	3.53	3.00
IT Skills	3.66	3.86	4.00
Public Speaking and Management	3.91	3.10	2.86
Analitycal and Graphic Desaign	2.57	3.48	3.50
Microteaching Skills	3.53	2.86	3.00

Table 5 showsn that there were 3 clusters formed, where for foreign language skills were mastered by the first cluster, then for IT Skills in the third cluster. While analytical and graphic design skills in the third cluster and microteaching skills in the first cluster. For the distribution of respondents to each respondent, it was shown in the table below:

Table 6. Number of Cases in each Cluster

Cluster	1	32.000
	2	21.000
	3	7.000
Valid		60.000
Missing		0.000

Based on table 6, it can be concluded that cluster 1 has 32 respondents, cluster 2 has 21 respondents and cluster 3 has 7 respondents. So that the total observed is 60 respondents.

CONCLUSION

Based on the result and discussion, we knew that cluster 1 with 32 respondent has more skills, it were foreign language, public speaking skills and microteaching skills. So for the students who have these skills, they should be placed in an internship area that brings out their potential to teach and develop public communication skills. Internship locations that match these skills clusters such as LBB then Publication Offices such as Radio, Jawapos, etc.

For second conclusion, we knew that cluster 2 with 21 respondent have more skills in middle. It was betweeen cluster 1 and 3, except for microteaching skills. Maybe some students dislike to teach but they very interested in other skills. Let we see on Table 5, it was dominant on IT and analytical skills. For students that have this skills, can be placed in an office that demonstrates IT, analytical and design skills but without showing any results, in this case like a presentation. Appropriate internship places for these students are in administrative offices, local government offices, etc

For third conclusion, that cluster 3 with 7 respondent have more skills too except public speaking but they have a middle skills in microteaching. It means that they can be placed in office that have more capability to communicate each other without teach, have good lobbying and management on the teams. The office or internship location where we can suggest is Dinas Parawisata, Perbankan that needs good communication and good team work, etc.

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