Jurnal Mantik, 5 (4) (2022) 2735-2740

Published by:Institute of Computer Science (IOCS)

Jurnal Mantik

Journal homepage: www.iocscience.org/ejournal/index.php/mantik/index

Survey on Ditenun Application Utilization Through Independent Learning – Independent Campus Program (Merdeka Belajar – Kampus Merdeka)

Humasak Tommy Argo Simanjuntak[1], Arlinta Christy Barus[2], Samuel Indra Gunawan Situmeang[3], Arie Satia Dharma[4]

[1234]Fakultas Informatika dan Teknik Elektro,
[1234]Institut Teknologi Del, Toba, 22381, Indonesia

E-mail: humasak@del.ac.id[1], arlinta@del.ac.id[2], samuel.situmeang@del.ac.id[3], ariesatia@del.ac.id[4]

ARTICLEINFO

Article history:

Received: Des 19, 2021
Revised: Jan 22, 2022
Accepted: Feb 28, 2022

Keywords:

Merdeka Belajar,
Kampus Merdeka,
DiTenun

ABSTRACT

The policy of Independent Learning - Independent Campus (Merdeka Belajar - Kampus Merdeka: MBKM) by the Ministry of Education, Culture, Research, and Technology provides opportunities for students to gain real work experience in an industrial or professional environment to prepare students in social, cultural, work and technological changes. DiTenun (Digital Tenun Nusantara) responds to this challenge by organizing an independent learning program to accelerate student work readiness while increasing the competitiveness of DiTenun's industry and products. This study aims to evaluate the successful implementation of MBKM in the development of the DiTenun application. The implementation was analyzed from the perspective of students and application users. This study used a survey research method and a saturated sampling technique. Hypothesis testing showed that the implementation of MBKM program positively affects the development of DiTenun application.

1. Introduction

PT. Digital Tenun Nusantara (PT. DiTenun) is a startup company that initiates innovative digital patterns of weaving. Recently, DiTenun developed an application accessible on website and mobile called DiTenun application. This application's main feature is to produce new weaving patterns using artificial intelligence yet still embrace the special characteristics of Indonesian weaving patterns (Barus et al., 2020). The application acts as a worksheet to help the weavers in producing new patterns. New patterns of weaving help to increase the competitiveness of DiTenun products and to attract consumers of the woven fabrics. As one pilot project, the application has been introduced to the Ulos weavers in Toba area in North Sumatera. The target communities for the pilot project were the local weavers from Toba, Samosir, North Tapanuli, and Humbang Hasundutan regencies. They are weavers' communities as partnering communities of DiTenun.

The performance of DiTenun application is yet to be optimized since the new pattern generating feature was relatively slow. The application used the algorithm of Semi-Supervised Generative Adversarial Network (SGAN) as its machine learning. It is necessary to explore new methods to generate patterns in a shorter time. The improved method is expected to also embrace the characteristics initiated from the first pattern so it can still be recognized as the variations of the original pattern.

Del Institute of Technology (Institut Teknologi Del: IT Del)'s research team researched to explore machine learning algorithms other than SGAN to generate patterns in form of an image more optimally. As stated previously, SGAN was used at DiTenun application. This research involved IT Del's students who were in their final year to join the research project. Students' involvement in an industrial or professional environment helps to gain real work experience to prepare students for social, cultural, work, and technological changes. This becomes one of the characteristic of Independent Learning Independent Campus or Program Merdeka Belajar Kampus Merdeka (MBKM) particularly in research section (Direktorat Jenderal Pendidikan Tinggi Kementerian Pendidikan dan Kebudayaan Republik Indonesia, 2020). Therefore, this

Accredited "Rank 4"(Sinta 4), DIKTI, No. 36/E/KPT/2019, December 13th 2019.

research evaluates the successful implementation of independent learning activities, particularly on the benefits of MBKM program for students and the improvement of the DiTenun application for the users or Ulos weavers. Moreover, this research project is expected to strengthen the link and match between academics and industry.

2. Methods

This research project used a survey research method and a saturated sampling technique. Survey research is research conducted on large and small populations using sample data taken from that population to find relative and distributive events, and relationships between sociological and psychological variables (Sugiyono, 2014). The population analyzed in this research was divided into two groups. The first group was seven IT Del students involved in MBKM program at DiTenun during the Odd Semester in the Academic Year of 2021/2022. The second group was divided into two subgroups. They were weavers who joined Training I (June 2021) and weavers in Training II (December 2021). The first population was used in the survey of benefits of MBKM for students while the second population was used in the two surveys conducted for the improvement of the DiTenun application for the users or Ulos weavers.

Following are the details of weavers based on the two training activities conducted in 2021:

2.1 Training I (June 2021)

There were twenty-nine weavers as DiTenun application users from four regencies: Toba, Samosir, North Tapanuli, and Humbahas (Humbang Hasundutan). The distribution of weavers who participated in Training I by regencies can be seen in Figure 1.

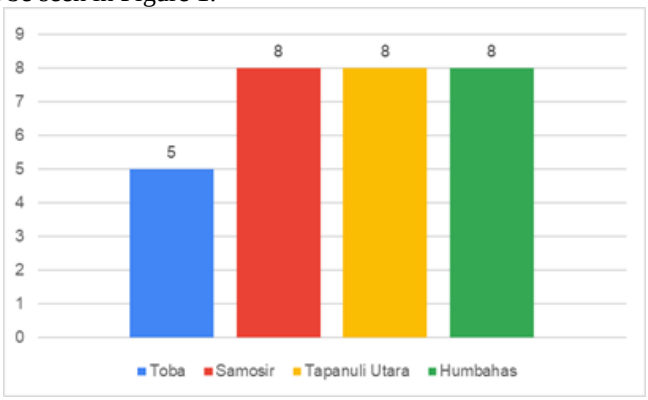

Fig 1. Distribution of Weavers at Training I by Regencies

2.2 Training II (December 2021)

There were twenty-six weavers as DiTenun application users from three regencies: Toba, Samosir, and North Tapanuli. The distribution of weavers who participated in Training II by regencies can be seen in Figure 2.

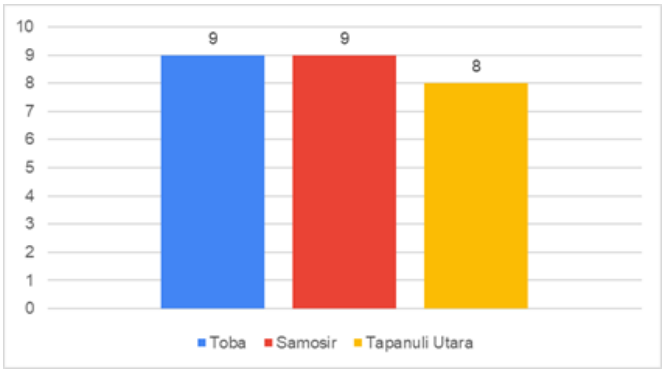

Fig 2. Distribution of Weavers at Training II by Regencies

Accredited "Rank 4"(Sinta 4), DIKTI, No. 36/E/KPT/2019, December 13th 2019.

3. Result and Analysis

The two surveys conducted in this research are presented as follows:

3.1 Benefits of MBKM program at DiTenun for students

Based on the survey, three benefits of the MBKM Program at DiTenun for students, namely:

a. Improvement of students capacity and capability

Students involved in MBKM program at DiTenun were able to hone their skills since they were involved as researchers for one semester. They also gained meaningful experience during the program. Specifically, as many as four students claimed that MBKM program helped them in improving their capacity while the other three felt that they had capacity improvement after joining the program.

b. Getting Adequate Training

All of the students received adequate training during their time as researchers for one semester at DiTenun. In particular, four students received adequate training to accomplish the task before joining the program while the other three received one during the program.

c. Improvement of Hard skills and Soft Skills

Improvement of hard skills and soft skills were gained by all of the students. They claimed that they gained a lot of hard skills and soft skills while being researchers for one semester at DiTenun.

Considering the many benefits obtained from the MBKM program at PT DiTenun, all students hoped to conduct other research in the future at DiTenun. Moreover, they highly recommended the MBKM program at PT DiTenun to other fellow students.

3.2 Improvement of DiTenun Applications for Application Users or Weavers

The comparison of DiTenun application before (Training I) and after (Training II) improvement can be seen in Table 1.

TABLE 1
COMPARISON OF DITENUN APPLICATION BEFORE (TRAINING I) AND AFTER (TRAINING II) IMPROVEMENT

Indicator	Before Improvement	After Improvement
Create new motifs from existing ones.	Yes	Yes
Designing fabric: composing patterns in one sheet of fabric.	Yes	Yes
Choose and combine colors in the cross-stitch editor.	Yes	Yes
Choose to generate patterns with colored or transparent backgrounds.	No	Yes
Editor function to crop, rotate and flip the image to be uploaded.	No	Yes
Categorization of patterns in the 'Pattern Gallery' according to the technique and type of Ulos	No	Yes
Save cross-stitch pattern at each stage of cross-stitch processing.	No	Yes
Edit/clean and save the cross-stitch generated by the cross-stitch generator.	No	Yes
Save the cross-stitch pattern created and reopen them in the Cross-stitch Editor from the 'My Patterns' page.	No	Yes
Pop-up setting for the cross-stitch sectional worksheet functions to adjust the size of the	No	Yes

Accredited "Rank 4"(Sinta 4), DIKTI, No. 36/E/KPT/2019, December 13th 2019.

Indicator	Before Improvement	After Improvement
cross-stitch section and the type of patterns technique.		
Color Palettes.	No	Yes
Three choices of fabric pre-s; Sadum, Puca, and Harungguan.	No	Yes
Function in the three pre-set layouts, there to change the color and improve the cross-stitch section of the patterns.	No	Yes
Change the color of the vertical lines in the Harungguan preset.	No	Yes
Save the fabric design created and reopen it in the Layout Editor from the 'My Fabric' page.	No	Yes

The evaluation of application improvement used survey data collected before implementation (1st survey) and after improvement (2nd survey). Five questions prepared were the same for the first and second surveys. After the recalculation of the post-test answers of participants in Training I and the corresponding answers to the questions of participants in Training II, the hypotheses tested were as follows:

H_0 : The understanding value of the respondents in the first survey is the same as the respondents in the second survei

H_1 : The understanding value of the respondents in the second survey is higher than the respondents in the first survey

Before conducting an independent t-test to test the hypothesis, the authors conducted the Levene test to check whether the variance of the participants' understanding values in the first and second survey was different or not, with the hypothesis being tested:

H_0 : The variety of understanding scores of participants in the first survey is the same as the respondents in the second survei

H_1 : The variety of understanding scores of participants in the second survey is higher than the respondents in the first survey

The results of the Levene test of respondents' understanding values in the first and second surveys can be seen in Table 2.

TABLE 2
LEVENE TEST OF RESPONDENTS' UNDERSTANDING VALUES IN THE 1ST SURVEY AND 2ND SURVEY

F Statistic	Significance Value
5,637	0,022

It can be seen that the significance value is smaller than the 5% significance level, so H_0 is rejected. This indicates that respondents' variety of understanding values in the second survey was not the same as their understanding in the first survey.

Furthermore, the statistical value of the t-test (t-count) for the t-independent test equal variances not assumed was -3.234 with a significance value of 0.003. Since the significance value was smaller than the 5% significance level, H_0 is rejected. This indicates that the understanding value of the second survey was higher than the first survey. Statistics on the understanding values of the respondents in the first survey and second survey can be seen in Table 3.

TABLE 3
STATISTICS OF UNDERSTANDING VALUES OF RESPONDENTS IN THE 1ST SURVEY AND 2ND SURVEY

	Respondent's Understanding Value	
Measures	1st Survey	2nd Survey
Total	24	26
Means	4	6,21

Accredited "Rank 4"(Sinta 4), DIKTI, No. 36/E/KPT/2019, December 13th 2019.

	Respondent's Understanding Value	
Measures	1st Survey	2nd Survey
Standard Deviation	2,88	1,78

There is a significant difference in the understanding value of respondents in the first and second surveys. Respondents better understand the applications that students have improved in the MBKM Program in the second survey with an understanding value of 6.21. The standard deviation is also lower with the value of 1.78. There was an increase of 2.21 points in the understanding value of the weavers after DiTenun application was improved.

Moreover, researchers also conducted an additional study to identify the characteristic of weavers. The study was conducted based on the second survey to examine the age distribution of weavers, distribution of the number of Ulos types weaved by each weaver, and distribution number of weavers on each type of Ulos.

Based on the research, it was found that weavers in Training II DiTenun were from various levels of age with the distribution shown in Figure 3.

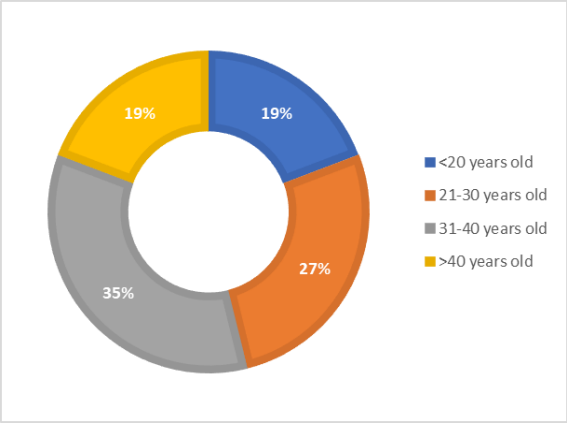

Fig 3. Distribution of Weavers at Training II by Age

As many as five people or 19% of the weavers who took part in the Training II aged more than 40 years old and less than 20 years old. Twenty-seven percent or seven weavers who participated in the second training were in the range of 21-30 years old. Nine weavers participated in the second training were between 31 and 40 years, with a maximum age of 49. It can be seen that the number of novice weavers (<20 and 21-30 years old) was not much different from the number of experienced weavers (31-40 and >40 years old).

The number of Ulos types that the weavers usually weaved varied quite extensively. One weaver usually can produce up to six types of Ulos. The distribution of the number of Ulos types commonly weaved can be seen in Figure 4.

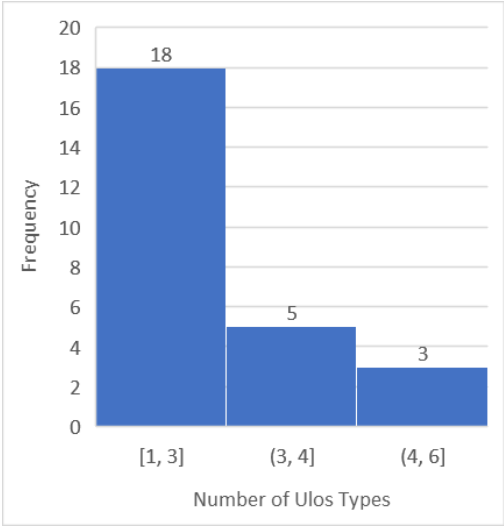

Fig 4. Distribution of Number of Ulos Types Weaved by Weaver

Accredited "Rank 4"(Sinta 4), DIKTI, No. 36/E/KPT/2019, December 13th 2019.

From the figure, however, it can be seen that weavers can only weave up to 3 types of Ulos.

There are 23 types of Ulos commonly weaved by weavers. They are Bulu Torus, Harungguan, Sibolang, Semi Harungguan, Ulos karo Jungkit, Ulos karo Tudung, Uis Nipes, Bintang Maratur, Mangiring, Sigaragara, Pucca, Pucca Klasik, Bekah Bulu, Sadum, Tumtuman Puca, Tumtuman, Ragi Hotang, Gatip, Hati Rongga, Maratur, Ulos Karo, and Ikat. Distribution number of weavers who worked on each of these types of ulos is shown in Figure 5.

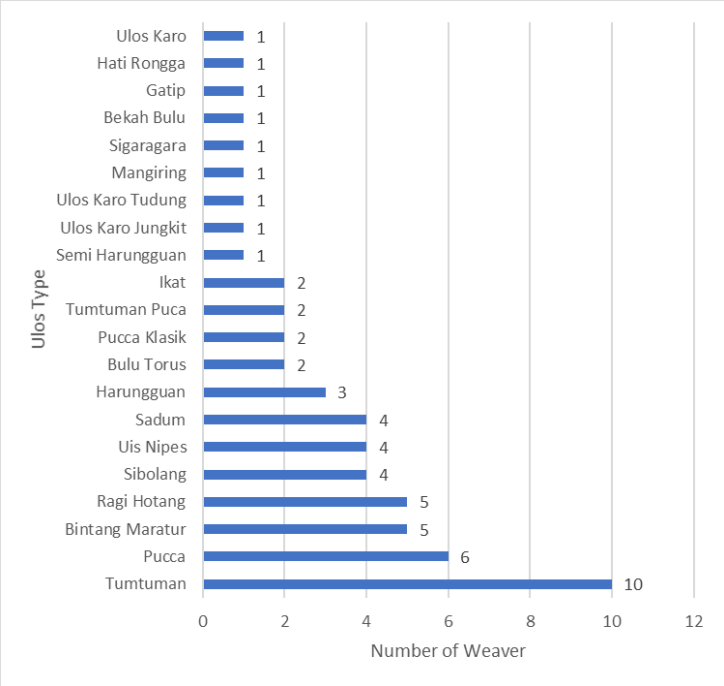

Fig 5. Distribution Number of Weavers On Each Type of Ulos

In the image, it can be seen that the most popular Ulos type woven is Tumtuman. Other types of Ulos are less popular, such as Ulos Karo, Hati Rongga, Gatip, Bekah Bulu, Sigaragara, Mangiring, Ulos Karo Tudung, Ulos Karo Jungkit, and Semi Harungguan.

4. Conclusion

Based on the survey, three benefits were achieved from the MBKM program at DiTenun for students, such as improvement of student capacities and capabilities, receiving adequate training, and improvement of students' hard-skills and soft-skills. All students also hoped to conduct other research in the future at DiTenun and would recommend the MBKM program at PT DiTenun to other students.

The survey also showed that DiTenun application improvements were achieved. The weavers as the application users also had a better understanding on how to utilize the application to produce weaving patterns. To conclude, the implementation of MBKM program positively affects the development of DiTenun application.

References

[1] Barus, A. C., Simanjuntak, M., & Situmorang, V, "DiTenun, Smart Application Producing Ulos Motif". In W. R. Adawiyah, Suliyanto, N. C. Afif, N. A. Prayogo, & T. Harisam (Eds.), SHS Web of Conferences, pp. 01025, https://doi.org/10.1051/shsconf/20208601025. 2020.

[2] Direktorat Jenderal Pendidikan Tinggi Kementerian Pendidikan dan Kebudayaan Republik Indonesia, "Buku Panduan Merdeka Belajar - Kampus Merdeka (1st ed.)", http://dikti.kemdikbud.go.id/wp-content/uploads/2020/04/Buku-Panduan-Merdeka-Belajar-Kampus-Merdeka-2020. 2020.

[3] Sugiyono, "Metode Penelitian Pendidikan: Pendekatan Kuantitatif, Kualitatif, dan R & D. Alfabet". 2014.

Accredited "Rank 4"(Sinta 4), DIKTI, No. 36/E/KPT/2019, December 13th 2019.