Educational Administration: Theory and Practice
2024, 30(5), 6555-6564
ISSN: 2148-2403
https://kuey.net/

Research Article

Pluralism Of Multimedia Course Curriculum In Indonesia With The Application Of Transferability Skills

Setya Chendra Wibawa[1], Purnomo[2*], Eddy Sutadji[3], Hakkun Elmunsyah[4]

[1]Universitas Negeri Malang, Vocational Education, Indonesia. setyachendrawibawa@gmail.com & setya.chendra.2005519@student.um.ac.id
[2]Universitas Negeri Malang, Vocational Education, Indonesia. *purnomo@um.ac.id
[3]Universitas Negeri Malang, Vocational Education, Indonesia. hakkun@um.ac.id
[4]Universitas Negeri Malang, Vocational Education, Indonesia. eddy.sutadji.ft@um.ac.id

Citation: Purnomo, t.al (2024), Pluralism of Multimedia Course Curriculum in Indonesia with the Application of Transferability Skills Educational Administration: Theory And Practice, 30(5), 6555-6564. Doi: 10.53555/kuey.v30i5.3975

ARTICLE INFO

ABSTRACT

This research aims to analyze the similarity of the Information Technology Education curriculum at several Institutes of Teaching and Educational Science and universities in Indonesia. Descriptive exploratories Research which is to execute a university that has Information Technology Education Study Programs and discover variable value, answers the problems in this research. Semester Program Plans (RPS) on Multimedia courses on average are in each study program in 18 Universities. The calculation uses SPSS version 26 using multidimensional scale analysis. The Euclidean Distance table used shows the stress value = 0.00197 or 0.197% less than 2.5% so it is categorized as 'PERFECT'. Several courses lead to pure informatics, so when compared to other universities informatics leads to education, for example in case studies using Multimedia courses, in some universities the final project leads to short filmmaking, while at UM and UB making applications even though it is limited to basic program and the appearance of UI/UX. The implication of this research is to give information on how the similarity of curricula for future policy.

Keywords: Vocational education, multidimensional scaling, Euclidean distance, Multimedia.

INTRODUCTION

Vocational education has a very important role in the industrial world because graduates are very much needed. Why is it needed? because the vocational education curriculum is in line with the industry. The role of industry is to provide input from material and curriculum elements so that education output is more focused[1]. Students' adaptability is needed in line with the concept of transferability skills. The stakeholder's expectation it students who are or have finished multimedia courses can be able to work with teams or independently in completing multimedia projects, not all curricula in the information education study program provide the same material, so it is necessary to know the strength map of each study program.

In classroom research, this study examines the human and social aspects of technology-based transformation. Understanding the study of material culture, visual culture, the environment, and other fields that have made advances in examining the connections between technology, capitalism, and cultural studies is essential to understanding how the digital age is changing. For instance, the University of Technology and Design (SUTD) in Singapore has developed a program that connects Southeast Asian studies with engineering and design[2].

In line with the development of technology used in industry, it is necessary to map the fields of vocational education[3] that will be developed. For example, area A has video and audio output, while region B has a more complete output, so there is a trend that companies will take workers from areas outside their region because they have more complete competence[4].

The problem of the Association of Information Technology Education (PVKTII) needs the synchronization or similarity of perceptions so that there is a similarity in the objectives of the information technology education study program, even though it requires local characteristics or wisdom in each study program. In fact, multimedia courses in each university have different curriculum content.

The vision and mission of the PVKTII association as an Enabler, Adhesive and Enhancing Quality of Indonesian

Informatics and Computer Higher Education and deliver all Study Programs and Universities in the field of Informatics and Computers to achieve minimum accreditation of GOOD in 2022. Its missions include: (1) fostering and developing the capabilities of universities and informatics and computer study programs, (2) fighting continuously for the existence and standards in the fields of informatics and computers, (3) collaborating efforts with the government in the development of policies and programs for higher education in informatics and computers, (4) pioneering and collaborating efforts with parties who have the same or aligned goals, government or private, domestically or abroad, (5) make efforts to set standards related to higher education in informatics and computers, (6) improve the quality of higher education in informatics and computers, research and development of Informatics and computer sciences, and related sciences. So, the equalization of perceptions in the development of study programs has distinctive characteristics in accordance with local culture. The above statement can be seen on PVKTII's official website at https://www.pvktii.or.id/ can be summarize that By attaining a minimum certification of GOOD in 2022, the PVKTII organization hopes to improve the caliber of higher education in Indonesian informatics and computers. In addition to guaranteeing culturally responsive study programs, its goals also include building university skills, advocating for standards, working with the government, defining standards, and increasing the quality of higher education in informatics and computer sciences.

The thing that needs to be considered is that information technology and / or informatics education is a study program that focuses on the field of education with engineering content. So, it is actually an advantage for this study program, because the engineering material is wrapped by education. So that graduates can enter the world of teaching in the field of engineering, especially information computer science and/or informatics.

This study was conducted with the intention of mapping out or identifying curriculum commonalities, with a focus on the multimedia theme. Differential Dimension Scaling (MDS)[5] is a statistical method that can be used to analyze the effect of several variables on other variables at the same time. Based on this research, will provide preliminary information related to the characteristics of Multimedia courses in each study program.

Multimedia subjects are interesting to choose in this study because (1) they are mandatory courses in the study program, although the naming is different but the material has some of the same average, (2) including the field of science that is used as a expertise program at SMK between other software engineering, multimedia, and computer network expertise programs, but along with the development of the independent learning curriculum, multimedia has changed to a Visual Communication Design expertise program.

There has been no research that tests the similarity of the curriculum in the information technology / informatics education study program, so that it becomes an opportunity to be researched and the results can be used as a reference in decision policy making.

1.1 Multidimensional Scaling (MDS)

1.2 A statistical technique called multidimensional scaling (MDS) can be used to examine the simultaneous effects of multiple factors on other variables[6]. That is the official sentence, that MDS fits the description, double scaling. Similar to a quadrant that often consists of only X and Y, this MDS can arrange particular subjects using a variety of criteria in order to classify them as good, fair, or awful and to compare them to one another[7]. For example: when you want to know the potential for curriculum development for Multimedia courses at various public and private Institutes of Technological and Vocational Education (LPTK) universities such as Universitas Negeri Surabaya (UNESA), Universitas Pendidikan Ganesha (UNDIKSHA), Universitas Negeri Gorontalo (UNG), following that, the supporting variables are gathered and can be divided into four groups: learning outcomes, resource potential, study program performance, and infrastructure support. All variables were categorized and then collectively mapped to the three LPTKs. The expected results of the MDS are to be able to find out which of there are more suitable for curriculum development for Multimedia courses. They can be categorized as good, sufficient, or lacking for curriculum development for Multimedia courses. In this study, the assessment used the Transferability Skills assessment, which is a parameter for future work policies, because issue regarding the work skills of graduates is needed to meet the needs of the formation of qualified graduates. One method that can be used to improve transferable ability is project-based education, which involves active and participatory experiences of students based on the local wisdom of their respective regions.

1.2. MDS Metrics based on Inertia

The percentage of diversity (inertia) used as a measure of the quality of the mapping is calculated by[5]:

$$\tau = \left(1'\lambda\right)^{-1} \times \lambda \quad (1)$$

The greater the inertia value, the smaller the error between the distance and the similarity value of the space presented.

1.3. MDS Metrics based on Stress

Is a metric that determines whether an item configuration as points in dimension **q** is good or not? Stress is a measure of error in computer calculations using ALSCAL (Alternative Least Square Scaling) (Lack of fit or error). The lesser the stress value, the smaller the error between the space's distance and similarity value will be indicated.[7]. Based on the goodness table Multidimensional Scaling results.

Table 1 the goodness of MDS results[5]

STRESS	CRITERIA
≥ 20%	Less
10% - 20%	Enough
5% - 10%	Good
2.5% - 5%	Very good
<2.5%	excellent

S To ascertain whether the MDS output is sufficient to represent the combination of variables used, stress and determination / R squared is utilized. R squared is considered positive if the value is increasing greater or closer to 1, whereas the stress value is considered good if the value is getting smaller or closer to 0.. Analysis Uses: (1) Get the relative position of an object compared to other objects. In many cases, business strategy is used for determining competitors and benchmarking; (2) Performing object grouping, an alternative to cluster analysis.

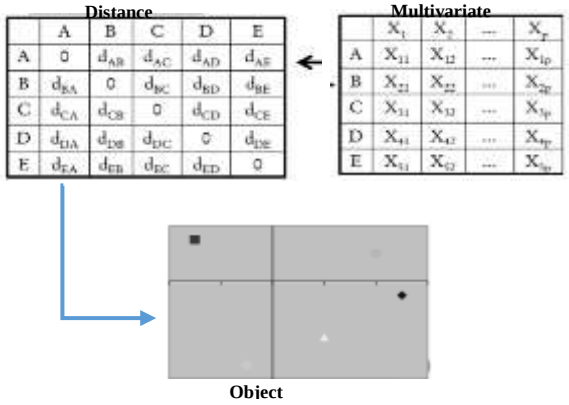

Figure 1 Multidimesional Scaling Analysis

Types of MDS Based on the scale of the data, MDS can be divided into (1) MDS metric if the data scale is interval or ratio (this study uses MDS metric); (2) Non-metric nonmetric MDS if the data scale is nominal or ordinal. DISTANCE MATRIX Based on the Euclidean distance formula, we get a Distance Matrix that states the distance between pairs of objects that may occur.

$$nDn = \begin{bmatrix} d_{11}.d_{12}...d_{1n} \\ \vdots \quad \vdots \quad \ddots \quad \vdots \\ d_{n1}.d_{n2}...d_{nn} \end{bmatrix} \quad (2)$$

1.4 Transferability Skills

The abilities, knowledge, and competencies known as transferability skills can help someone land and keep a job, grow professionally and adapt to change, find another job if they decide to leave, and go back to the workforce, posits that in the analysis of transferability there are three main levels, namely: (1) the macro level, work is a structurally strategic part, the shift in system-level capitalism, and how the framework of the education system is coordinated; (2) the level of meso, employment opportunities and employment of persons related to activities mediated by the institution are strategic in education; and (3) the micro level is a way of working that is at the level of the person and its subjective relationships, psychosocial dynamics, individual profiles, and background. Actually, attribute of transferability skills include (1) communication skills[8][9]; (2) problem-solving skills[10][11]; (3) critical thinking skills[12][13]; (4) the severity of the presentation skills[14][15]; (5) decision-making skills[16]; (6) teamwork skills[17][18]; (7) learning skills[19][19]; (8) adaptability skills[20][21]; (9) skills of working with equipment[21][22]; (10) career skills[23][24]; (11) leadership skills[11][25][26]; (12) project management skills[27][28]; (13) team management skills[18][29]; (14) time management skills[30][31]; (15) skills in using information technology[32][33]; (16) skills to value diversity[34][35]; and (17) negotiating skills[18][36]. Then the above attributes are applied to each of the research projects.

The perception of students in the development of work skills that is very prominent is teamwork and the importance of the concept of work readiness [37]. Yidan Wang (2012), Certain competences, skills, behaviors, attitudes, collaboration, and social responsibility can be developed in secondary education, including vocational education, enabling one to engage in economic knowledge, contribute to social cohesiveness, and become a responsible citizen. The capacity to create, share, and apply knowledge that supports economics can be acquired through higher education.

Building a flexible educational system, modernizing, and developing the necessary skills, and enhancing work

conditions are three crucial aspects of maximizing human resources (Figure 2). A flexible system adapts to changing conditions by giving students what they need, fostering the necessary knowledge and abilities, and making learning more accessible. In addition to preparing students for higher-level study, education also serves to point students and workers in the direction of the workforce.
A flexible structure, as shown in Figure 2, enables the educational system to adapt to the demands of shifting talents, such as soft skills and collaboration. Flexibility makes it possible for companies and outside parties to contribute to the creation of curricula and internship opportunities. The demand for talents is not always met because of the imbalance between supply and demand. differences between the demand for and supply of skills (Figure 2). The five job titles that are challenging to fill are as follows: (1) trading; (2) sales representatives; (3) technicians, (4) engineers; and (5) accounting and *finance staff*.

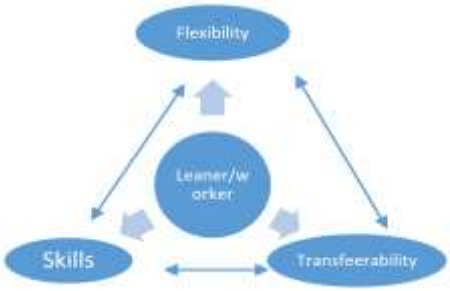

Figure 2 Tripathite Learning Framework[38]

1.5 Multimedia Course

Multimedia is one of the courses in STEM education, this transformation is triggering an increase in identity diversity in global cultures, many countries are developing for STEM education at the expense of language and cultural learning, including area studies that are important for diversity. The era of disruption presents challenges for multimedia courses to develop in accordance with the local culture of the region so that they can be accepted by the local community[2].
Since photography, audiography, videography, graphics, and animation are all studied under the science of multimedia, every material already has multimedia content. [39][40][41]. Although multimedia is more commonly recognized as interactive media, it is increasingly essential to every branch of study due to the destructive times we are living in. The creation of multimedia learning tools can help students who engage in higher order thinking to think more creatively, understand concepts better, and enjoy learning so that they are well-liked by everyone. Although multimedia is more commonly recognized as interactive media, it is increasingly essential to every branch of study due to the destructive times we are living in. The creation of multimedia learning tools can help students who engage in higher order thinking to think more creatively, understand concepts better, and enjoy learning so that they are well-liked by everyone. [42][43][44]. Photographic capabilities, audiography content development skills, graphic design skills, video content creation skills, and animation skills were the types of content employed as the basis for this study. Then the skills above are combined with transferability skills so that the learning content of multimedia courses is really based on 21st century skills.
Various kinds of multimedia course curriculum designs in universities in Indonesia indicate the local policies of the area where the university is located. This is a problem that needs to be researched to find out the similarity of multimedia course material in the information technology education study program or the like.

RESEARCH METHOD

Descriptive exploratories Research which an exploratory approach to executing a university that has Information Technology Education Study Programs. A descriptive approach to discover variable value and answer the problems in this research. Based on the quadrant analysis of the configuration map image of universities that have Information Technology Education study programs. Multimedia subject materials studied include photography, audiography, videography, animation, and graphic design. The calculation uses SPSS version 26 using multidimensional scale analysis.
The data collection techniques carried out are (1) field research, namely interviews, preliminary studies to find research problems and questionnaires related to multimedia subject matter. The research was carried out by means of observation and interviewing the head of the study program as well as lecturers who teach Multimedia courses at several universities that have S1 Information Technology and or Informatics Education study programs. Data in the form of response results based on questionnaires and test results of student project results of course content such as photography, audiography, videography, animation, and graphics, thenthe iolah becomes data that is analyzed leading to whether there are similarities in content in multimedia courses. For sampling using a non-probability sampling technique with purporsive sampling. The population is in the form of 790 students from 18 information technology/informatics education study programs, who have been or are currently participating in Multimedia courses. Multimedia subject materials studied are limited to

photography, audiography, videography, animation, and graphic design. The curriculum is in the form of RPS and the output of the course compared to each study program studied.

Based on the quadrant analysis of the configuration map image of LPTK and universities that have Information Technology Education study programs. Multimedia subject materials studied include photography, audiography, videography, animation, and graphic design. The calculation uses SPSS version 26 using multidimensional scale analysis (MDS).

It can be seen that the pattern of closeness between universities is as follows: Universitas Trunojoyo Madura (UTM), Universitas Pendidikan Ganesha (UNDIKSHA) in Bali, Universitas Negeri Gorontalo (UNG) in Gorontalo North Sulawesi, Universitas Negeri Padang (UNP) in South Sumatera, Universitas Negeri Medan (UNIMED) in North Sumatera, Universitas Negeri Makassar (UNM) ini South Sulawesi, Universitas Negeri (UM) in East Java, Universitas Brawijaya (UB) in East Java, Universitas Negeri Yogyakarta (UNY) in Central of Java, Universitas Negeri Manado (UNIMA) in North Sulawesi, Universitas Negeri Semarang (UNNES) in Central of Java, Universitas Negeri Surakarta (UNS) in Central of Java, Universitas Muhammadiyah Surakarta (UMS) di Central Java, Universitas Pendidikan Indonesia (UPI) in West Java, Universitas Negeri Jakarta (UNJ) in Jakarta, FKIP Universitas Lampung (FKIP-UNILA) in Sumatera, UM-TASIKMALAYA ini West of Java, Universitas Negeri Surabaya (UNESA) in East of Java. Statistics that are related to multidimensional analysis, among others: (1) Similarity judgments, i.e. mclosely all possible brand pairs or other stimuli within the limits of their similarity using the Likert scale, (2) Preference ranking, i.e. sequence of ranking brands or other stimuli ranging from the most preferred to the least preferred. This detention center was obtained from respondents, (3) Stress, which is a measure of model incompatibility. The higher the stress value, the less in accordance with the resulting model, (4) R-squared, i.e. i.e. squared correlation indicating the proportion of variance optimality of scale data that can be applied by MDS. This is a measure of the difficulty of the model, (5) Spatial map, i.e. mexplaining the relationship between brands or other stimuli that are described as geometric relationships between points in multidimensional space, (6) Coordinate, that is, indicating the position of the brand or a stimuli in a spatial map, (7) Unfolding, that is, therepresentation of the brand and respondents in the same space.

Multidimensional Scaling (MDS) analysis deals with creating a graph (map) to describe the position of an object with another object, based on the similarity of these objects. The step using MDS as figure 2:

1) Assign many points to the coordinates of an n-dimensional space. Two dimensions, three dimensions, or higher could constitute an N-dimensional space (at least in theory; 4-dimensional spaces and beyond are hard to represent). The orientation of the coordinate axes is mostly decided at random by the researcher. For maps such as the one in the above simple example, axes representing east/west and north/south directions make the most sense.
2) Find the Euclidean separations between every two points. The Euclidean distance is the "as the crow flies" straight-line distance in Euclidean space between two points, x and y. It is a little trickier to compute with the Pythagorean theorem in n-dimensional space (c2 = a2 + b2). See "Euclidean Distance in n-dimensional space" for more details. The result of this is the similarity matrix..
3) Examine the stress function and compare the original input matrix and the similarity matrix. Stress measures goodness-of-fit based on length differences between expected and actual distances. In his early MDS work, Kruskal said that fits that are almost zero are excellent and that anything above should be considered "bad.". More recent writers propose basing stress assessment on the accuracy of the distance matrix and the number of items in that matrix.
4) If required, change coordinates to reduce stress.

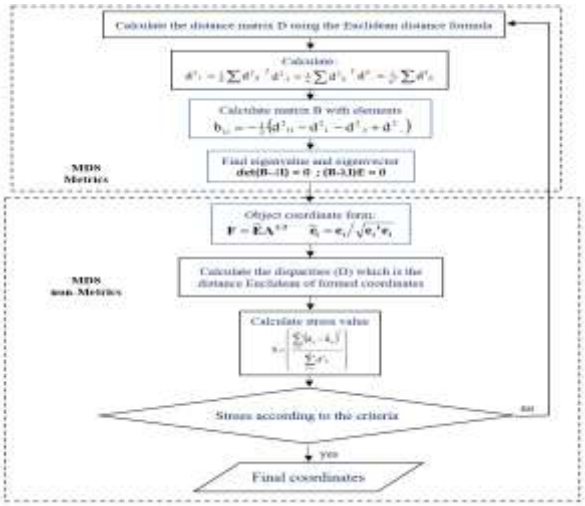

Figure 2 Step Using Multidimensional Scaling

RESULTS AND DISCUSSION

Based on interviews from several heads of study programs and lecturers who teach Multimedia courses at several universities that have Information Technology or Informatics Education study programs, as well as response results. Also, point out the significance of the results and place the results in the context of other work and theoretical background. Analysis based on quadrants in the image of the LPTK University configuration map above can be seen the pattern of closeness between universities as follows:

Table 2 University Quadrant Group

Quadrant	University
Group I	UNS, UMS, UPI, UNJ, UNESA,UNY, UNIMA
Group II	UNNES, UM_TASIKMALAYA, UNM
Group III	UTM, UNDIKSHA, UNG, UNP, UNIMED, FKP_UNILA
Group IV	UM, UB

Table 2 describes the grouping of curricula that have content capabilities, in this case, the Multimedia subject with photography, audio, video, animation, and graphic[45] content as in table 3, which is taken from the results of statistical processing in Figure 3.
The smaller / closer the distance, the closer the similarity of the material being taught, from the configuration map above, which have very close similarities are UNS, UMS, UPI, UNJ, UNESA, UNY, and UNIMA in Quadrant 1. The seven universities have something in common, based on the results of interviews and curriculum data collection from the head of the study program and from the official website stated that UNS, UMS, UPI, UNJ, UNESA, UNY, and UNIMA have almost the same vision in the Multimedia course in the field of audio-visual.

Table 3 Curriculum data for multimedia courses

No	Multimedia	Photography	Audio	Video	Animation	Graphics
1	UNESA	22.3	23.8	11.7	69.5	5.7
2	UNJ	24.7	24.7	9.7	70.1	80.1
3	UNNES	3.6	25.6	11.7	68.7	177.9
4	UNS	23.9	26.6	1.1	69.7	146.8
5	UNG	17.2	25.8	11.9	66.7	400.3
6	UNDIKSHA	3.4	25.1	15.2	77.1	403
7	UM	455	27.4	18.1	73.6	301
8	UNP	3.5	25.3	14.3	73.7	300.9
9	UTM	112	25.6	7.8	73.6	363.9
10	UNM	3.2	27.9	17.5	69.7	216
11	UNIMED	2.3	25.4	11.2	74.3	294
12	UNY	111	25.6	7.4	75.3	136
13	UB	231	21	5.3	77.1	145
14	UPI	79	25.8	8.8	74.7	157.8
15	UMS	97	26.9	11.9	74.5	115.7
16	UM_TASIKM	3.3	27.7	17.4	69.8	215.3
17	FKIP_UNILA	2.4	25.3	11.3	74.5	293.8
18	UNIMA	112	25.5	7.3	75.5	135.7

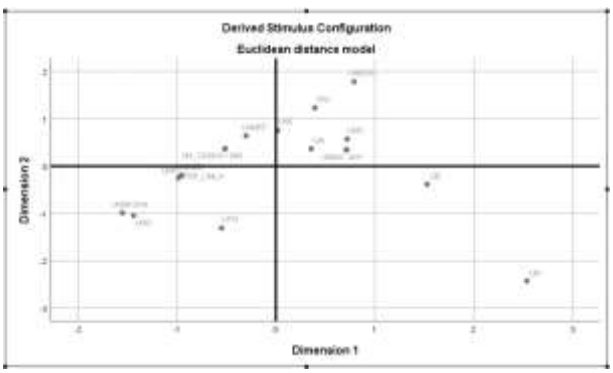

Figure 3 Curriculum data grouping which has similarities

According to Table 4, the stress value of 0.00197 or 0.197% is less than 2.5%, According to Table 1, it is

categorized as "EXCELLENT". Quadrant 2 contains the UNNES, UM_TASIKMALAYA, and UNM groups, based on searches from interviews and curriculum data collection more towards animation and computing. Quadrant 3 contains groups of UTM, UNDIKSHA, UNG, UNP, UNIMED, FKP_UNILA, and Multimedia courses designed more towards graphics but does not rule out the possibility in the direction of computing.

Table 4 Iteration history for the 2-dimensional

Case Processing Summary[a]

Cases					
Valid		Missing		Total	
N	Percent	N	Percent	N	Percent
5	100.0%	0	0.0%	5	100.0%

a. Euclidean Distance used

Raw (unscaled) Data for Subject 1

	1	2	3	4	5	6	7	8	9	10
1	.000									
2	74.473	.000								
3	173.224	100.084	.000							
4	141.534	67.285	30.648	.000						
5	384.648	320.315	222.825	253.837	.000					
6	397.839	323.724	225.285	257.516	17.812	.000				
7	499.450	466.584	456.012	444.814	461.378	475.260	.000			
8	295.843	221.893	123.129	156.061	100.613	102.161	453.848	.000		
9	369.308	296.952	215.374	234.425	101.865	115.715	360.024	125.633	.000	
10	211.265	137.849	30.623	74.080	184.952	187.182	453.498	85.095	183.920	.000
11	209.038	215.117	116.243	149.195	107.611	109.115	454.434	7.683	130.124	78.434
12	157.801	102.984	115.553	98.177	280.619	287.978	364.167	196.973	227.909	134.757
13	251.131	216.457	230.056	207.358	333.262	344.210	249.906	275.993	269.235	239.134
14	162.446	94.916	78.317	56.938	250.398	256.482	388.477	161.893	208.731	96.114
15	133.097	80.769	112.373	80.316	295.681	302.197	384.198	207.486	248.682	137.528
16	210.573	137.133	37.907	73.372	185.639	187.873	453.458	85.779	184.414	.768
17	288.834	214.912	116.052	148.997	107.909	109.305	454.317	7.827	130.151	78.241
18	158.128	103.674	116.606	89.208	281.245	288.632	363.325	197.777	228.208	135.753

	11	12	13	14	15	16	17	18
11	.000							
12	191.821	.000						
13	273.069	120.457	.000					
14	156.331	38.750	152.672	.000				
15	201.895	25.113	137.476	45.905	.000			
16	79.112	134.248	238.818	95.595	136.941	.000		
17	.332	191.600	272.875	156.109	201.672	78.918	.000	
18	192.639	1.072	118.475	39.754	25.478	135.245	192.418	.000

Iteration history for the 2 dimensional solution (in squared distances)
Young's S-stress formula 1 is used.
Iteration S-stress Improvement
1 .00084
Iterations stopped because
S-stress is less than .005000
Stress and squared correlation (RSQ) in distances
RSQ values are the proportion of variance of the scaled data (disparities)
in the partition (row, matrix, or entire data) which
is accounted for by their corresponding distances.
Stress values are Kruskal's stress formula 1.
For matrix
Stress = .00197 RSQ = .99999
Stress = .00158 RSQ = 1.00000

According to Figure 3, UM and UB in Quadrant 4 are universities that have a Multimedia course which is very different from other universities. The results of interviews and curriculum data collection used at UM that the Multimedia course uses project-based learning with the output of making simple applications by emphasizing UI and UX in line with UB which emphasizes study programs towards informatics computing and a bit of graphics.

Figure 4, explains that all courses in the information technology education study program, even though they have characteristics according to their respective regions, still have linearity to the material that must be in the Multimedia course.

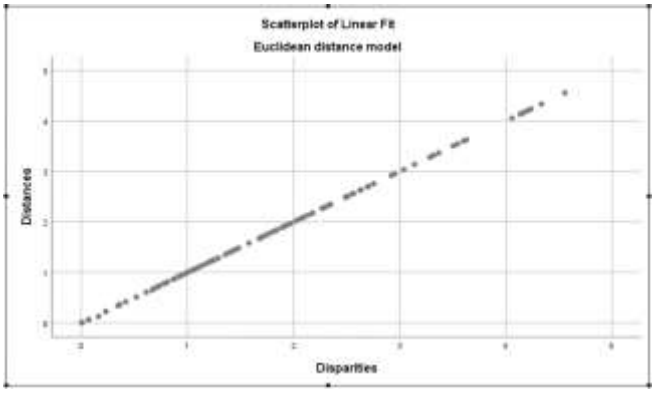

Figure 4 Linearity of curriculum data

If associated with the transferability skills that are embedded in the Multimedia lecture curriculum there are several skills used among others: (1) communication skills; (2) problem-solving skills; (3) critical thinking skills; (4) the severity of the presentation skills; (5) decision-making skills; (6) teamwork skills; (7) adaptability skills; (8) skills of working with equipment; (9) leadership skills; (10) team management skills; (14) time management skills; (15) skills in using information technology; and (17) negotiating skills.

CONCLUSION

It can be concluded that based on the vision and mission of the Association, namely there is harmony between information technology/informatics education study programs so that the courses launched have an impact on local wisdom and regionally[46], so that this study shows that there are similarities and differences in the Multimedia course being studied. It is shown that the differences in Multimedia courses at UM and UB universities may have non-linear curriculum content, while other study programs have similarities in the Multimedia course curriculum so that it can be said to be linear. Several courses lead to pure informatics, so when compared to other universities informatics leads to education, for example in case studies using Multimedia courses, in some universities the final project leads to short filmmaking, while at UM and UB quadrant group IV making applications even though it is limited to the appearance of UI / UX. Subjects that have similarities are quadrant group I = UNS, UMS, UPI, UNJ, UNESA, UNY, UNIMA; quadrant group II = UNNES, UM_TASIKMALAYA, UNM; quadrant group III = UTM, UNDIKSHA, UNG, UNP, UNIMED, FKP_UNILA Quadran I, II, and III have the high similarity, so it can be implied that the content multimedia course has closer material to each other for learning become a policy in deciding to choose a study program base on transferability skills choose.

REFERENCES

[1] F. Arianty and T. A. Purwanto, "A Review of Vocational Education Curriculum in Accordance with Industrial Needs: Case Study," *KnE Soc. Sci.*, vol. 3, no. 11, p. 15, 2018, doi: 10.18502/kss.v3i11.2747.

[2] T. Winichakul, "Southeast Asian Studies in the Age of STEM Education and Hyper-utilitarianism," 수완나부미, vol. 10, no. 2, pp. 157–180, 2018, [Online]. Available: http://libezp.lib.lsu.edu/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=edsers&AN=edsers.354691&site=eds-live&scope=site&profile=eds-main.

[3] W. Eichhorst, N. Rodríguez-Planas, R. Schmidl, and K. F. Zimermann, "A road map to vocational education and training in industrialized countries," *Ind. Labor Relations Rev.*, vol. 68, no. 2, pp. 314–337, 2015, doi: 10.1177/0019793914564963.

[4] A. Dardiri, "Soft Skill and Entrepreneurial Career Guidance Model for Enhancing Technical Vocational Education and Training's Graduates Competitiveness," *Innov. Vocat. Technol. Educ.*, vol. 12, no. 1, pp. 1–7, 2016, doi: 10.17509/invotec.v12i1.4497.

[5] D. S. Putri, S. Wahyuningsih, and D. R. Goejantoro, "Analisis Positioning dengan Menggunakan Multidimensional Scaling Nonmetrik (Studi Kasus :Data Persepsi dan Preferensi Konsumen Berdasarkan Merek Smartphone di Samarinda, Kalimantan Timur) Positioning Analysis using Multidimensional Scaling Nonmetric (Case," *J. Eksponensial*, vol. 9, no. 1, pp. 85–94, 2018.

[6] T. H. A. Bijmolt, M. Wedel, and W. S. DeSarbo, "Adaptive Multidimensional Scaling: Brand Positioning Based on Decision Sets and Dissimilarity Judgments," *Cust. Needs Solut.*, 2020, doi: 10.1007/s40547-020-00112-7.

[7] Y. Yin and P. Shang, "Modified multidimensional scaling approach to analyze financial markets," *Chaos*, vol. 24, no. 2, 2014, doi: 10.1063/1.4873523.

[8] C. van der Vleuten, V. van den Eertwegh, and E. Giroldi, "Assessment of communication skills," *Patient Educ. Couns.*, vol. 102, no. 11, pp. 2110–2113, 2019, doi: 10.1016/j.pec.2019.07.007.

[9] Ş. Can, H. Durgun, and B. K. Dalcalı, "Effect of online communication skills training on effective communication and self-efficacy and self-regulated learning skills of nursing students: A randomized controlled study," *Nurse Educ. Pract.*, vol. 63, no. 9, 2022, doi: 10.1016/j.nepr.2022.103371.
[10] G. Molnár, S. A. Alrababah, and S. Greiff, "How we explore, interpret, and solve complex problems: A cross-national study of problem-solving processes," *Heliyon*, vol. 8, no. 1, 2022, doi: 10.1016/j.heliyon.2022.e08775.
[11] V. E. Guzmán, B. Muschard, M. Gerolamo, H. Kohl, and H. Rozenfeld, "Characteristics and Skills of Leadership in the Context of Industry 4.0," *Procedia Manuf.*, vol. 43, pp. 543–550, 2020, doi: 10.1016/j.promfg.2020.02.167.
[12] M. Durnali, "'Destroying barriers to critical thinking' to surge the effect of self-leadership skills on electronic learning styles," *Think. Ski. Creat.*, vol. 46, no. March, p. 101130, 2022, doi: 10.1016/j.tsc.2022.101130.
[13] A. Meirbekov, I. Maslova, and Z. Gallyamova, "Digital education tools for critical thinking development," *Think. Ski. Creat.*, vol. 44, no. November 2021, p. 101023, 2022, doi: 10.1016/j.tsc.2022.101023.
[14] F. A. Boyd, "Developing presentation skills: A perspective derived from professional education," *English Specif. Purp.*, vol. 8, no. 2, pp. 195–203, 1989, doi: 10.1016/0889-4906(89)90030-6.
[15] J. Shinge and S. Kotabagi, "To Improve presentation skills of the engineering students through a Vis-à-vis evaluation approach - A pedagogical experiment," *Procedia Comput. Sci.*, vol. 172, pp. 350–356, 2020, doi: 10.1016/j.procs.2020.05.168.
[16] J. U. Siebert, R. E. Kunz, and P. Rolf, "Effects of decision training on individuals' decision-making proactivity," *Eur. J. Oper. Res.*, vol. 294, no. 1, pp. 264–282, 2021, doi: 10.1016/j.ejor.2021.01.010.
[17] A. Gibert, W. C. Tozer, and M. Westoby, "Teamwork, Soft Skills, and Research Training," *Trends Ecol. Evol.*, vol. 32, no. 2, pp. 81–84, 2017, doi: 10.1016/j.tree.2016.11.004.
[18] T. Baviera, A. Baviera-Puig, and C. Escribá-Pérez, "Assessing Team Member Effectiveness among higher education students using 180° perspective," *Int. J. Manag. Educ.*, vol. 20, no. 3, 2022, doi: 10.1016/j.ijme.2022.100702.
[19] O. Chuvgunova and S. Kostromina, "Planning as a Learning Skill of Students," *Procedia - Soc. Behav. Sci.*, vol. 217, pp. 132–138, 2016, doi: 10.1016/j.sbspro.2016.02.045.
[20] E. M. Loughlin and A. Priyadarshini, "Adaptability in the workplace: Investigating the adaptive performance job requirements for a project manager," *Proj. Leadersh. Soc.*, vol. 2, no. August 2020, p. 100012, 2021, doi: 10.1016/j.plas.2021.100012.
[21] F. Smaldone, A. Ippolito, J. Lagger, and M. Pellicano, "Employability skills: Profiling data scientists in the digital labour market," *Eur. Manag. J.*, no. April 2021, 2022, doi: 10.1016/j.emj.2022.05.005.
[22] M. A. Islam, "Industry 4.0: Skill set for employability," *Soc. Sci. Humanit. Open*, vol. 6, no. 1, p. 100280, 2022, doi: 10.1016/j.ssaho.2022.100280.
[23] P. A. Creed *et al.*, "Organisational career growth: implications for future perceived employability in students who work," *Int. J. Educ. Res.*, vol. 112, no. May 2021, p. 101950, 2022, doi: 10.1016/j.ijer.2022.101950.
[24] R. Ahmad and H. Imam, "Roles of competencies, career shock, and satisfaction in career commitment: Evidence from project-based organizations," *Proj. Leadersh. Soc.*, vol. 3, no. June, p. 100052, 2022, doi: 10.1016/j.plas.2022.100052.
[25] I. Zohar, "'The Art of Negotiation' Leadership Skills Required for Negotiation in Time of Crisis," *Procedia - Soc. Behav. Sci.*, vol. 209, no. July, pp. 540–548, 2015, doi: 10.1016/j.sbspro.2015.11.285.
[26] M. M. Luedi, "Leadership in 2022: A perspective," *Best Pract. Res. Clin. Anaesthesiol.*, vol. 36, no. 2, pp. 229–235, 2022, doi: 10.1016/j.bpa.2022.04.002.
[27] A. Ribeiro, A. Amaral, and T. Barros, "Project Manager Competencies in the context of the Industry 4.0," *Procedia Comput. Sci.*, vol. 181, no. 2019, pp. 803–810, 2021, doi: 10.1016/j.procs.2021.01.233.
[28] M. Radujković and M. Sjekavica, "Project Management Success Factors," *Procedia Eng.*, vol. 196, no. June, pp. 607–615, 2017, doi: 10.1016/j.proeng.2017.08.048.
[29] Y. Ponomareva, T. Uman, V. Bodolica, and K. Wennberg, "Cultural diversity in top management teams: Review and agenda for future research," *J. World Bus.*, vol. 57, no. 4, p. 101328, 2022, doi: 10.1016/j.jwb.2022.101328.
[30] S. A. Murray, J. Davis, H. D. Shuler, E. C. Spencer, and A. Hinton, "Time management for STEMM students during the continuing pandemic," *Trends Biochem. Sci.*, vol. 47, no. 4, pp. 279–283, 2022, doi: 10.1016/j.tibs.2021.12.010.
[31] C. M. Doggett, "WORK _ Time management," *Nurse Educ. Today.*, vol. 12, no. 4, pp. 283–286, 1987, [Online]. Available: https://doi.org/10.1016/0260-6917(92)90161-G.
[32] S. Seufert, J. Guggemos, and M. Sailer, "Technology-related knowledge, skills, and attitudes of pre- and in-service teachers: The current situation and emerging trends," *Comput. Human Behav.*, vol. 115, no. August 2020, p. 106552, 2021, doi: 10.1016/j.chb.2020.106552.
[33] K. Binici, "What are the information technology skills needed in information institutions? The case of 'code4lib' job listings," *J. Acad. Librariansh.*, vol. 47, no. 3, p. 102360, 2021, doi: 10.1016/j.acalib.2021.102360.
[34] J.-H. Wei, A. V. Lacaste, I. N. Rodliyah, H. T. Nguyen, and H.-H. Chuang, "Teachers' Multicultural

Experience, Creative Teaching, and Cultural Intelligence: A Study of Four Asia–Pacific Countries," *Think. Ski. Creat.*, vol. 46, no. April, p. 101144, 2022, doi: 10.1016/j.tsc.2022.101144.
[35] E. J. Ihemezie, L. C. Stringer, and M. Dallimer, "Understanding the diversity of values underpinning forest conservation," *Biol. Conserv.*, vol. 274, no. July, p. 109734, 2022, doi: 10.1016/j.biocon.2022.109734.
[36] L. Eastgate, M. Hood, P. A. Creed, and A. Bialocerkowski, "Managing work and study with an eye on the future," *Int. J. Educ. Res. Open*, vol. 3, no. November 2021, p. 100142, 2022, doi: 10.1016/j.ijedro.2022.100142.
[37] P. A. Nilsson and N. Ripmeester, "International student expectations: Career opportunities and employability," *J. Int. Students*, 2016, [Online]. Available: https://ojed.org/index.php/jis/article/view/373.
[38] S. Nilsson, "Enhancing individual employability: the perspective of engineering graduates," *Educ. Train.*, 2010, doi: 10.1108/00400911011068487.
[39] R. E. Mayer, "Multimedia learning," *Psychol. Learn. Motiv. - Adv. Res. Theory*, vol. 41, pp. 85–139, 2002, doi: 10.5926/arepj1962.41.0_27.
[40] A. Kesten, "Computer technology in education and issues of power and equity," *Jounal Soc. Sci. Educ. Res.*, vol. 1, no. 1, pp. 88–106, 2010, [Online]. Available: http://www.sosyalbilgiler.org/A/dergi/index.php/JSSER/article/view/7.
[41] S. Studies and S. Bilgiler, "Developing future t eachers' digital competence via massive open online courses (MOOCs) Yerkinay Yelubay 1 , Dina Dzhussubaliyeva 2 ," vol. 13, no. 2, pp. 170–195, 2022.
[42] A. Kristanto, C. A. P. Rahayu, and S. C. Wibawa, "The Development of Augmented Reality Media for Physics Subject in Learning Optical Devices Material at SMK Multimedia," *Adv. Soc. Sci. Educ. Humanit. Res.*, vol. 372, no. ICoET, pp. 198–206, 2019.
[43] M. S. Sumbawati, R. C. Wibawa, Munoto, and S. C. Wibawa, "Development of Vocational Interactive Multimedia based on Mobile Learning," *IOP Conf. Ser. Mater. Sci. Eng.*, vol. 288, no. 1, 2018, doi: 10.1088/1757-899X/288/1/012101.
[44] C. Dwyer, *Multimedia in Education*, vol. 30, no. 4. 1993.
[45] E. Tool, "Multimedia as an Educational Tool 2," 1997.
[46] Anonymous, "The Association of Information Technology Education," 2022. https://pvktii.or.id/ (accessed Oct. 17, 2022).