Graduation Profile Mapping: A Study of Bibliometric Analysis of the Curriculum

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A B S T R A C T

Mapping is very necessary in making the right decision based on the scientific mapping of each. This is very useful in mapping graduate profile relationships. The aim of the study was to map elective courses in the curriculum of the Information Systems Study Program at the State Islamic University of North Sumatra based on bibliometric analysis. The research process is carried out by analyzing graduate profiles, then the analysis process uses the publish or perish application with google scholar study sources. The results of the analysis are then processed using the Mendeley application to filter the details of each source and finally using the VoS Viewer application to visualize the mapping results.

Keywords:

Mapping, Bibliometric, Publish or Perish, Mendeley, VoS Viewer

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1. INTRODUCTION

In compiling the curriculum, it is necessary to map without mapping, so the curriculum will not work according to the desired vision and mission. This mapping can be done using a scientific approach[1]. This includes using applications to support a mapping. The mapping process is done graphically to find the EBCP theme[2].

In conducting monitoring, it can be done with several applications starting from looking at the studies that have been carried out. In this research search based on keywords[3]. Publish or perish has been used in research on changing organizational goals towards innovation[4]. As well as research on The Complexities of Global Surgery Authorship[5]. This use has also been carried out in analyzing the bibliometric publications of Faculty Physician Assistants[6]. Some studies state that Publish or Persih (PoP) is A Scientific Blueprint for a Journal Article[7]. The academic mantra, to the point of cliché, is "PoP"[8]. PoP is used to harvest research metadata based on given keywords.

Basically the metadata is incomplete and there are incomplete details. So we need Mendeley and collect some of the same references. The use of Mendeley is very helpful in terms of collecting references that will be obtained for the VoS Viewer application. VoS Viewer systematic mapping and bibliometric analysis studies have been carried out in studying the state of the art of diplomacy in international relations[9]. As well as digitalization and technological developments in various business sectors[10].

2. RESEARCH METHOD

The research methodology is a research process that has four steps; namely data collection, analysis using Publish or Perish, reference collection and detailed research filter sources used, visualization mapping processing using VoS Viewer.

Figure 1 illustrates the research methodology

2.1 Keyword

Keywords are useful as a basis for searching research data that has been done. This was obtained from collecting data on the profiles of graduates of the Information Systems study program at the State Islamic University of North Sumatra.

2.2 Publish or Persish

After the keywords are obtained, then analyze the hidden keywords using the Publish or Persih application. The search sources used are from Google Scholar to Google scholar.

2.3 Mendeley

These Reference Tools are used to collect PoP analysis results which are metadata. So that the collected data can be filtered and equipped with less detail. As the sources obtained do not have abstracts and keywords which are the basis of VoS Viewer processing.

2.4 VoS Viewer

Furthermore, free mapping analysis is displayed using the VoS Viewer application. In the application, several mappings can be seen from the relationship between scientific studies, authors and years of research.

3. RESULT AND DISCUSSION

Results and discussion is an explanation of the results of the steps of the research method.

3.1 Keyword data

The keyword data used is the profile of graduates in the Information Systems study program. In order to introduce the Information Systems Study Program which is still new and is still the only country in the city of Medan, the information systems study program wants to give birth to scientists in the field of Information Systems, namely in accordance with the Main Profile of Graduates of the Information Systems Study Program including: IS Developer, ERP Consultant, Corporate Information Systems Designer, Data Scientist, E-Business Entrepreneur, Business Startup Leader, System Analyst and IS Project Manager.

3.2 Publish or Perish Analysis Results

The sources analyzed were 300 Google Scholar indexed publication sources. The results of the metadata of each keyword are as follows:

Publication years:	1996-2016
Citation years:	26 (1996-2022)
Papers:	8
Citations:	16
Cites/year:	0.62
Cites/paper:	2.00
Authors/paper:	1.00
h-index:	2
g-index:	3
hI,norm:	2
hI,annual:	0.08
hA-index:	1

(a)

Publication years:	1993-2012
Citation years:	29 (1993-2022)
Papers:	14
Citations:	158
Cites/year:	5.45
Cites/paper:	11.29
Authors/paper:	1.00
h-index:	6
g-index:	12
hI,norm:	6
hI,annual:	0.21
hA-index:	2

(b)

Figure 2. (a) IS Developer citation metrics (b) Information System Developer citations metrics

Figure 2 shows the metrics of an “IS Developer” and “Information System Developer” using a PoP application. Research on IS Developers started from 1993 to 2016 with Scopus search sources.

Publication years:	2007-2014
Citation years:	15 (2007-2022)
Papers:	9
Citations:	75
Cites/year:	5.00
Cites/paper:	8.33
Authors/paper:	1.00
h-index:	4
g-index:	8
hI,norm:	4
hI,annual:	0.27
hA-index:	2

Figure 3. ERP Consultans citation metrics

Figure 3 explains the results of metrics for ERP Consultans starting from 2007 to 2014 with a total of 9 papers indexed by Scopus.

Publication years:	1964-2018
Citation years:	58 (1964-2022)
Papers:	43
Citations:	817
Cites/year:	14.09
Cites/paper:	19.00
Authors/paper:	1.67
h-index:	16
g-index:	28
hI,norm:	13
hI,annual:	0.22
hA-index:	4

Figure 4. Information Systems Designer citation metrics

Figure 4 is the result of metric analysis from the Information System Designer on the keywords obtained by the Corporate Information Systems Designer. This keyword was not found in the study so the corporate keyword was omitted. For this keyword itself research began in 1964 to 2018

Publication years:	2009-2022
Citation years:	13 (2009-2022)
Papers:	31
Citations:	330
Cites/year:	25.38
Cites/paper:	10.65
Authors/paper:	1.00
h-index:	9
g-index:	18
hI,norm:	9
hI,annual:	0.69
hA-index:	6

Figure 5. Data Scientist citation metrics

Figure 5 shows the results of the data scientist keyword analysis, which is something that has just been published starting from 2009 to 2022. The search source is a Scopus indexed journal publication.

Publication years:	2007-2022
Citation years:	15 (2007-2022)
Papers:	5
Citations:	46
Cites/year:	3.07
Cites/paper:	9.20
Authors/paper:	1.00
h-index:	3
g-index:	5
hI,norm:	3
hI,annual:	0.20
hA-index:	3

Figure 6. E-Business Entrepreneurship citation metrics

Figure 6 is the result of an analysis of E-business entrepreneurship, these keywords were studied starting from 2007 to 2022.

Publication years:	1996-2022
Citation years:	26 (1996-2022)
Papers:	10
Citations:	373
Cites/year:	14.35
Cites/paper:	37.30
Authors/paper:	1.00
h-index:	5
g-index:	10
hI,norm:	5
hI,annual:	0.19
hA-index:	4

Figure 7. Business Startup citation metrics

Figure 7 is the result of analysis from Business Startup, keywords obtained using the word Leader. For keywords using Leader not found so the keywords used are only business startup. The keyword research starts from 1996 to 2022 with search sources are Scopus indexed journal publications.

Publication years:	1967-2021
Citation years:	55 (1967-2022)
Papers:	28
Citations:	557
Cites/year:	10.13
Cites/paper:	19.89
Authors/paper:	1.00
h-index:	12
g-index:	23
hI,norm:	12
hI,annual:	0.22
hA-index:	2

Figure 8. System Analyst citation metrics

Figure 8 is the result of the analyst system keyword analysis, these keywords were studied from 1967 to 2021. Search sources based on Scopus indexed journal publications.

Publication years:	2002-2022
Citation years:	20 (2002-2022)
Papers:	7
Citations:	11
Cites/year:	0.55
Cites/paper:	1.57
Authors/paper:	1.00
h-index:	2
g-index:	3
hI,norm:	2
hI,annual:	0.10
hA-index:	1

(a)

Publication years:	1998-2019
Citation years:	24 (1998-2022)
Papers:	4
Citations:	168
Cites/year:	7.00
Cites/paper:	42.00
Authors/paper:	1.00
h-index:	3
g-index:	4
hI,norm:	3
hI,annual:	0.13
hA-index:	3

(b)

Figure 9. (a) IS Project Manager citation metrics and (b) Information System Project manager citation metrics

Figure 9 is the keywords from the IS Project Manager, these keywords were studied from 1998 to 2022 search sources based on Scopus indexed journal publications.

3.3 VoS Viewer Bibliometric Analysis Results

The selection of data types in the VoS Viewer is a term co-occurrence map based on data. The fields used are title and abstract fields, the calculation method is full count. The size of the threshold is determined from the total number of appearances following the VoS Viewer application filter. The number of terms to be selected also follows the VoS Viewer recommendations.

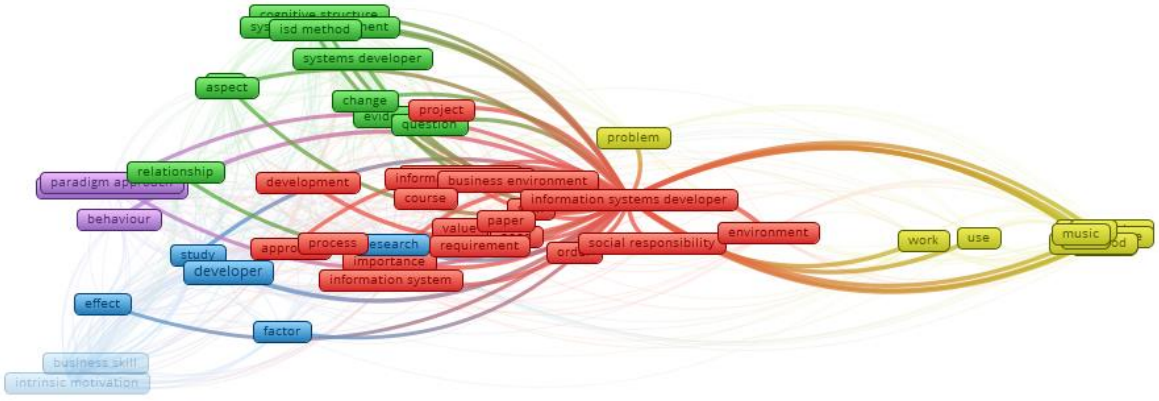

Figure 10. Information System Developer Network Visualization

In Figure 10 the minimum number of occurrences of a term is 2 out of 266 terms, 54 meets the threshold. The results of the Information system developer cluster have mapping results that correlate with business environment, information systems, system developers, business skills.

Figure 11. ERP Consultants Network Visualization

In Figure 11 the minimum number of occurrences of a term is 1 out of 63 terms, 63 meets the threshold. The results of the consultant ERP cluster produced a mapping that was found to correlate with project management, ERP projects, business processes.

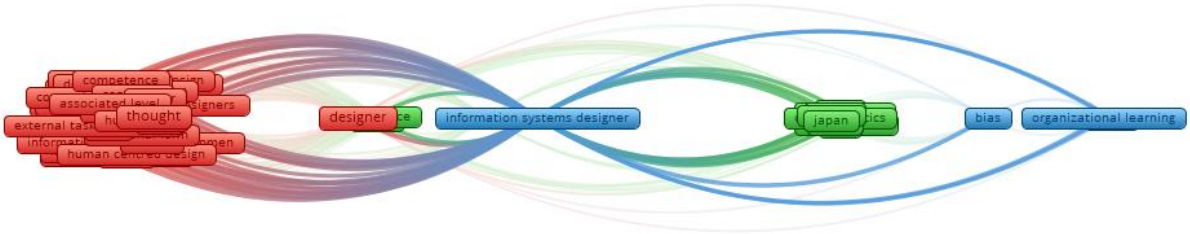

Figure 12. Information Systems Designer Network Visualization

In Figure 12 the minimum number of occurrences of a term is 2 out of 92 terms, 55 meets the threshold. The results of the information system developer cluster produce a mapping correlated with the designer, human centered design.

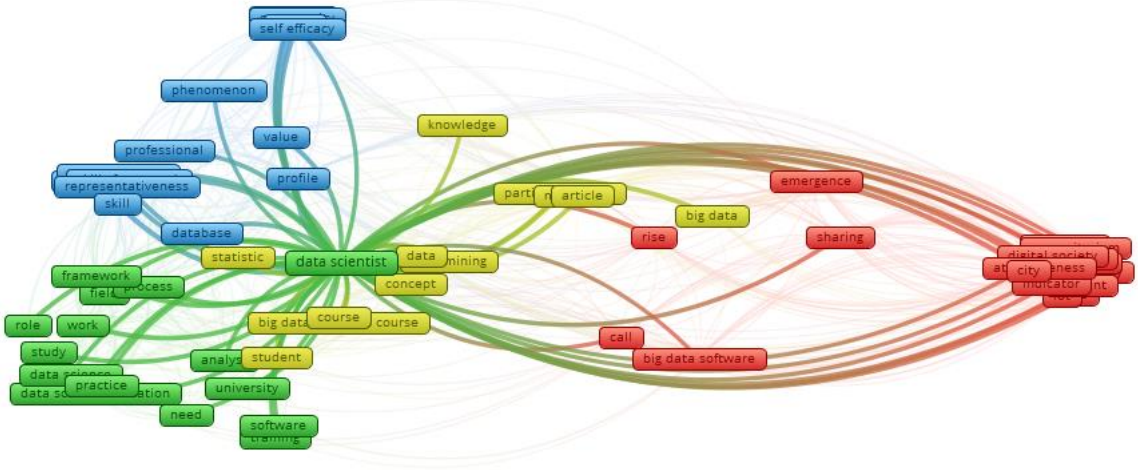

Figure 13. Data Scientist Network Visualization

In Figure 13 the minimum number of occurrences of a term is 2 out of 343 terms, 61 meets the threshold. The results of the data scientist cluster produce correlated mapping with analytics, data science, big data, statistics, digital society, smarter city, data mining.

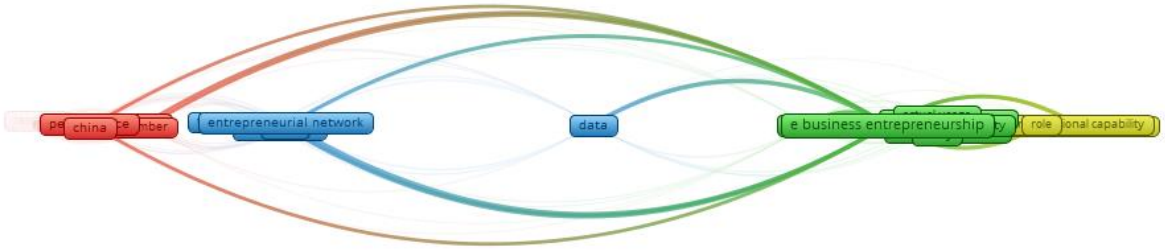

Figure 14 E-Business Entrepreneurship Network Visualization

In Figure 14 the minimum number of occurrences of a term is 2 out of 103 terms, 24 meets the threshold. The results of the scinetist data cluster produce a mapping that correlates with e-business innovation, entrepreneurial networks, and social networks.

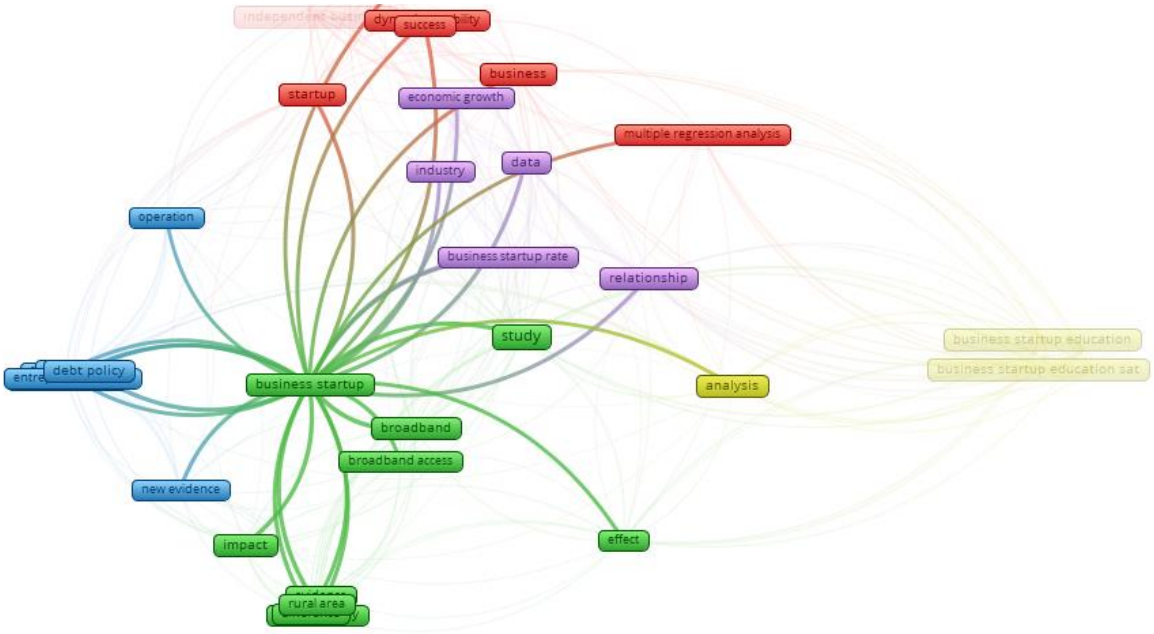

Figure 15 Business Startup Network Visualization

In Figure 15 the minimum number of occurrences of a term is 2 out of 256 terms, 41 meets the threshold. The results of the scinetist data cluster produce a correlation mapping with entrepreneurs, businesses, startups.

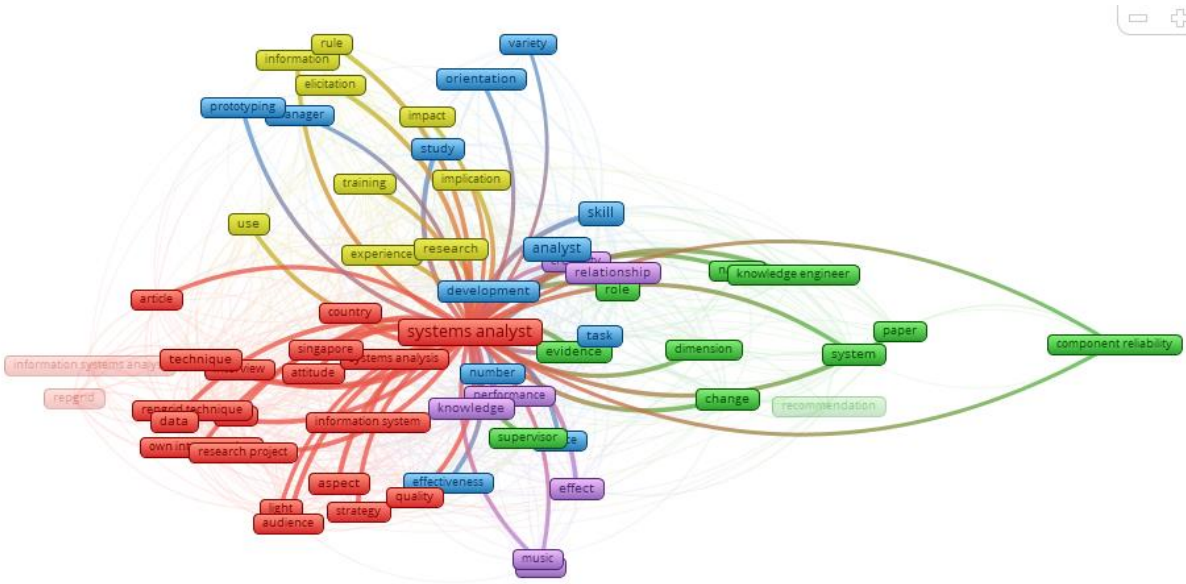

Figure 16 System Analyst Network Visualization

In Figure 16 the minimum number of occurrences of a term is 3 out of 466 terms, 61 meets the threshold. The results of the data scientist cluster produce a correlation mapping with information systems, information system analysts, system analysis.

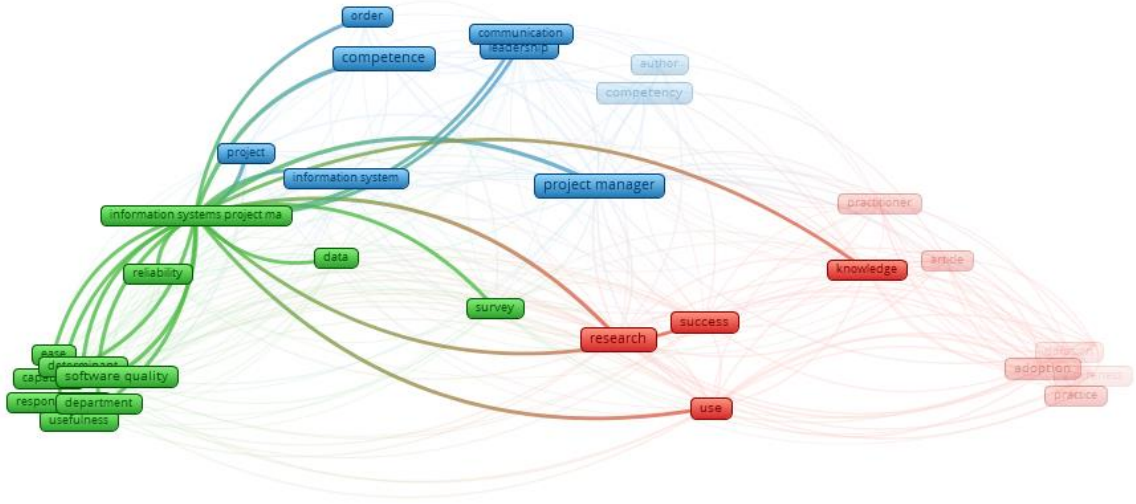

Figure 17 IS Project Manager Network Visualization

In Figure 17 the minimum number of occurrences of a term is 2 out of 143 terms, 31 meets the threshold. The results of the scinetist data cluster produce mappings correlated with software quality, information systems, project managers.

From the 8 keywords that have been searched for the network visualization, the results of the mapping can be seen (see table 1).

Table 1. Mapping of Vos Viewer Visualization Cluster Network Correlation Results Based on Scopus Research

No	Keyword	Correlation Cluster
1	IS Developer	Business Environment, Information Systems, System Developers, Business Skills
2	ERP Consultant	Project Management, ERP Projects, Business Processes
3	Information Systems Designer	Designer, Human Centered Design
4	Data Scientist	Analytics, Data Science, Big Data, Statistics, Digital Society, Smarter City, Data Mining
5	E-Business Entrepreneur	E-Business Innovation, Entrepreneurial Networks, Social Networks
6	Business Startup Leader	Entrepreneurs, Businesses, Startups
7	System Analyst	Information Systems, Information System Analysts, System Analysis
8	IS Project Manager	Software Quality, Information Systems, Project Managers

Table 1 shows several correlations related to each keyword such as system information owned by the IS Developer, System Analyst and IS Project Manager keywords.

4. CONCLUSION

The use of PoP is very helpful in finding references by minimizing search time. However, the results obtained are only in the form of metadata. In this study, the data needed is a publication source with a title and abstract. PoP does not look for abstracts in publications, so a Mendeley reference tool is needed to filter publications that do not contain abstracts and look back at the original source to add an abstract. This allows reduction of search results on the PoP. The filter results from Mendeley will be processed by the VoS Viewer to produce a Network Visualization which allows showing the mapping of each keyword. From the results of the discussion there are several possible correlations to be used as mapping. These results can provide input to the study program in developing the curriculum and mapping the vision and mission.

7. REFERENCES

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