ISSN 2278-3091
Volume 9, No.5, September - October 2020
International Journal of Advanced Trends in Computer Science and Engineering
Available Online at http://www.warse.org/IJATCSE/static/pdf/file/ijatcse32952020.pdf
https://doi.org/10.30534/ijatcse/2020/32952020

Analyzing Employers' Feedback Using Text Analytics: An Associative Based Approach

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ABSTRACT

Employers' feedback gives a reliable information about the readiness and performance of the graduates in every academic institution. However, the complexity surrounding the feedback of employers' perceptions to the need to incorporate the perspectives in the workplace and the employees' performance recognizing the differences in which process of learning occurs in the workplace is a challenging task. This study proposes an associative based text approach to analyze employers' feedbacks on the skills necessary for a certain job. The proposed approach incorporates associative / relationship of words in analyzing feedbacks promotes a deeper analysis. Empirical results show that statistics job related needs skills in "data visualization" and "skills in computer" as suggested by the employers. Clearly, the most suggested skills in teaching related job were "Communication Skills" and "Skills in Research". In addition, the result clearly shows that an accounting related job should possess skills in accounting, analytical, and numerical. Communication skill is a necessary skill in the accounting related job. The proposed text mining approach provides a meaningful relationship between word / word patterns that can classify the needed skills for a certain job. Such feedback is useful in the curriculum review and enhancement and in developing sustained relationships between stakeholders such as the industry and the academe.

Key words : Associative based approach, Employers' feedback, Graduates, Skills, Curriculum enhancement.

1. INTRODUCTION

Every nation is investing in its human capital development since it plays an important role to its economic productivity. Human capital is associated with economic growth and it can help to increase the productivity by developing the knowledge and skills of its workforce [1]. Human capital gives a positive effects on economic growth and strengthen the economic opportunities [2]. The employees engaging in work activities may typically possess the abilities and skills in sustaining their employment. Those skills may be developed when graduates started to their jobs or can be learned during their educational years.

The concept of employability became a critical issue, especially to the new entrants in the labor markets. Employability is the graduate's achievement and his/her potential in obtaining a job [3]. Gaining the skills for employment is necessary for the new graduates aside from the knowledge on their academic subjects [4]. Also, the graduate must possess a set of abilities, experiences, attitudes and personal skills in getting a job [5]. Now a days, employers prefer applicants who have the employability skills and can contribute immediately to their place when hired. Employers tend to prioritize applicants who are well-experienced. With this, new graduates are now the less priority and job markets tend to demand a high level of skills which may not be attained in the education system. It is necessary to identify the skills required by the employers to determine whether there is a gap in updating the employees' skills [6].

From the survey results as of January 2019 of the Philippine Statistics Authority, 26.9 % of the unemployed were college graduates. One key issue of the higher education institutions (HEIs) in the Philippines is to produce graduates who are capable for employment. HEIs experience pressure in providing graduates with skills and abilities for any type of work. One of the solutions of the HEI's is the enhancement of the curricula in meeting the needs of the work community. There should be a cooperation between universities and work environment in aligning the academic teaching with jobs' needs [7].

Curriculum enhancement requires the involvement of different stakeholders. Graduates who are directly experiencing the significance and content of an institutions' curricula and the quality of instruction as delivered by its faculty members have a great impact in improving the curricula. Also, employer engagement has a direct impact on the teaching and learning to work-related activities in order for the students understand the long term gain after their academic learning. One way to attain this is to gather the feedbacks of graduates where they are employed. Through employers' feedbacks, universities are guided in enhancing their curriculum and estimating how they perform against the criteria. Employer's feedback can generate evidence on the competence of the graduates, their capabilities and performance in the school and is usually reported as the employers' level of satisfaction to the graduates [8, 9]. Further, it can provide data on graduates' skills and qualities they consider very important and useful in the workplace.

HEIs are making strategies to improve the competence of graduate employability since it was found out that there is a

mismatch between the competence and employers' needs [10]. Consequently, conducting assessments of employers' feedbacks will be valuable in determining the future directions and requirements of tertiary programs. The Pangasinan State University and its campuses aspire to be more effective, more competitive, and more innovative in its provision as an institution of higher learning. The university will be given baseline information about the quality of its graduates and the requirements of employers, which may prove indispensable in enhancing the curriculum of different programs. The Bachelor of Science in Mathematics, in particular, the feedbacks of employers on the performance of its graduates will yield evidence on the relevance of its curriculum and the quality of instruction it provides. These data will be used to enhance the said program offering and enable the graduates to prepare for better opportunities on employment.

Pangasinan State University is faced with challenges on the rigid training and concern on the readiness of new graduates that would prepare them for the world of work. In short, the industry expects so much from the academe to produce qualified graduates, but the gap is still evident. In this study, its aim is to examined and analyzed employers' feedbacks to provide reliable information for our institution in assessing and improving its BS Math program and to meet the demands of the different industries and its stakeholders.

2. RELATED LITERATURE AND STUDIES

2.1 Employability Skills

Employers have certain requirements which are essential to the success of their companies. Most employees are obligated to meet the required competence and skills for them to succeed to the place they work with. Identifying skill sets should be a priority of every academic institution which will be an advantage to the employers and align the curriculum to address those demands [11]. The graduate's competence in employability skills could give them an advantage on their jobs[12]. Succi [13] suggests that academic institutions and companies must be on the same page in guiding graduates in taking individual responsibility to acquire and develop these essential skills in order to continuously acclimate to the varying labor market and increasing chance of employability. Employability skills are skills set in getting a job. Shukla and Kumar[14] arrived at a list of important soft skills that are considered a must for workplace success, and these are : communication skills, leadership skills, team building skills, strategic thinking skills, critical thinking skills, analytical & problem solving, interpersonal skills , imagination or creativity, presentation skills. Among these employability skill, Suarta [15] suggested that decision-making skills, communication skills, and problem-solving are with highest importance. Dearing [16] considered the following skills that should be developed at undergraduate level: communication, numeracy, and learning with the demands of technology. Also, communication skills, technical skills, problem-solving skills, decision-making skills and interpersonal skills have been considered in determining the relationship between skills and employees' performance. [17]

2.2. Employer's Feedback

Researches on employer's feedback has focused mainly on extracting information related to job observation, performances and satisfaction. Employers' feedback is relevant in the assessment and improvement of the curriculum of a program. Kasika [18] confirmed that educational qualifications have an important role on the skill and competence on work performance. In the context of preparing graduates for employment, generic and technical skills should be incorporated in the curriculum. Most employers require applicants to have the academic skills, higher-order thinking skills and personal qualities because these skills are critical for employment and workplace success [19]. Lausanne [20] contended that an academic institution must provide individuals that possess required skills in human resources that could compete successfully in a global economy. Moreover, HEIs must equip its graduates with relevant skills and qualities that will address the increasing demands of work [21],[22].

To determine the employer's feedback, researchers normally use both quantitative and qualitative approaches.

2.3 Employer's Feedback using Quantitative Approach

Academic institutions are much critically concern on the performance of their graduates in a work environment. Generally, result of feedback may differ dependent on the feedback mechanism employed. Most academic institutions employ a system that regularly assess its graduate using a structured feedback. Structured feedback is the primary use in survey research and has a close association with quantitative analysis[23]. Structured feedback using survey method could directly assess the competence of its graduate in a specific job skills. Moreover, the methodology can identify specific areas for improvement using the satisfaction rating from their respective employer[24]. Determining employers satisfaction provides a tangible evidence on the relevance of the curriculum with the aide of workforce competitiveness [25].

Employers serves as customers of academic institutions in terms of providing relevant jobs to their graduate. Brits[26] contended the importance of the customer satisfaction as it determines the alignment of institution's quality management philosophy by identifying the attributes that are essential for graduates in the workplace.

2.4 Employer's Feedback using Qualitative Approach

Traditionally, employers feedback analysis is based on structured data and with the advancement of technology and changes in methods, companies are shifting toward unstructured forms of feedback that require extensive technological support. Text mining is a technology that employs natural language processing (NLP) which transform the unstructured data into normalized structured data suited for analysis which provides a wider perpective on the given views, comments or sentiments. Amaratunga & Baldry [27] reiterated that employer's feedback instead of performance

assessment has a greater influence on the employees' development and efficiency.

Lu Gao [28] employed text analytics to identify the relevant skill and competence required on jobs in the construction industry. To further improve the curricula of the Information System (IS) program, [29], [30], used Text Mining to identify the most highly sought-after workforce skills of the industry. This method which enables automatic mining of information from textual data, is gaining in popularity although currently there is still a limited number of literature that focus mainly on the analysis of employers' feedback.

With the era of digitization, this research aims to fill the industry skill gap using the perspective of the employers. In addition, there is a little literature that employed a text mining approach in understanding employers' feedback. Moreover, this topic has been uncommonly touched in literature and needs more focus regarding to its importance for both academic institutions and employers [301]. Subsequently, data analytics has a great potential in addressing problems in a data – driven world [31]. This study focuses more on feedback analysis applying associative approach using data analytics.

Figure 1 describes the conceptual framework of the study wherein the main purpose of the first step is to identify the employers' feedbacks on job skills. The process starts with the initial data collection pertaining to employers. instructional delivery.

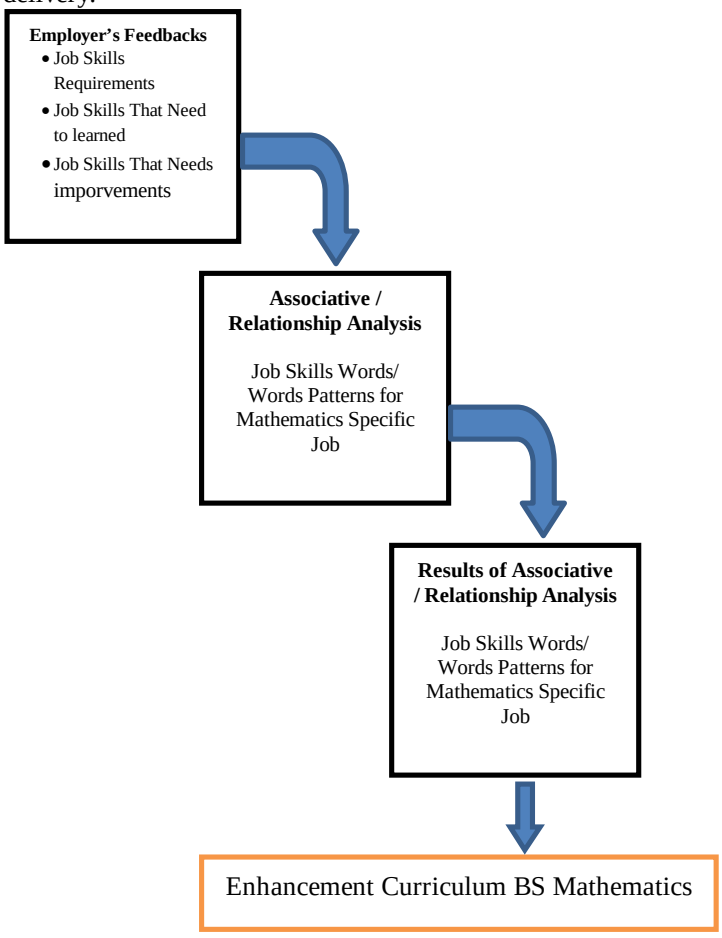

Figure 1: Conceptual Framework

The job skills requirements, job skills that need to be learned and the job skills that need improvement are included in the employers' feedback. Since graduates are employed to different jobs, the proposed framework should assist the HEIs in identifying the subject-related skills to be included in the curricula and in the in the instructional delivery.

The second step is modeling. This includes the use of data in determining the prominent skills possessed by the graduates. The association rule allows to identify the relationships between the job skills that are necessary to the positions they filled in.

The result of the association analysis is the patterns of words that are frequently associated together for Mathematics specific jobs. The extracted patterns are the basis in identifying the skills to be integrated in the enhancement of the curricula for BS Mathematics program which is very crucial to every institution.

3. THE MATERIAL AND METHOD

3.1 Research Design

The research used the qualitative and quantitative research in order to examine the employer's feedback on the performance of PSU-BS Math graduates in terms of the level of satisfaction and assessment of competencies. In addition, descriptive research is utilized with the describe factual, accurate and systematic data that can be used in averages, frequencies and similar statistical calculations. Text mining is used to analyze the employer's feedbacks on the employee's performance and needed job skills to enhance employee's productivity. Furthermore, employer's feedbacks were utilized to improve curriculum to help increase the employability of BS math graduates.

3.2 Respondents

Respondents of this research were BS Math graduates from 2015 – 2020 and are connected or presently employed. This is to ensure that their employer can assess their performance and their observation reflects the kind of graduates produced by PSU.

Table 1: Demographic Profile of the Industry Sector who are Employed PSU- Graduates

Year Graduated	Number of Graduates
2015	11
2016	11
2017	18
2018	14
2019	40
Total	90

The table reveals that the majority of the BS math graduates were new in their workplace and just applying the acquired skills that they learned from the university. This is also a good time for employer's to assess the performance of their

employees and provide feedback to the university to improve its curriculum and imbed necessary skills.

3.3 Instrument

Data gathering Instrument was developed by the Commission on Higher Education (CHED) however, modification and enhancement were made and added some questions to fit in this study. The survey questionnaire is composed of the four parts. Part 1 profile of the employer. Part II focuses on the profile of their employee who is a graduate of PSU BS math program. Part III gathered the competencies assessment and degree of satisfaction and the items used a five-point Likert type scale to measure an employer degree of satisfaction and level competencies. Part IV was aligned to ask the employers, what are their feedbacks on the skills needed for a certain job and needed to improve and be useful in the current jobs of our graduates.

The instrument was revised and pilot-tested using OJT undergraduate students who were not included in the actual survey, to eliminate survey question ambiguity and improve instrument reliability. The survey questionnaire was modified based on the results and feedbacks from the pilot study.

3.4 Procedure

Names of BS math graduates were taken from the registrar office to find out where these graduates are connected and presently employed. A letter asking permission to float survey questionnaire was forwarded to the company and after the approval was permitted the researchers distributed the questionnaire to the alumni. Alumni were asked and tasked to ask their employees to answer the questionnaires.

Ninety (90) BS Math graduates and their employees/companies that were asked to answer the survey questionnaire, however, only eighty seven (87) employer respondents and the respective company had the time to participate in the survey and provided complete and accurate answers. The remaining 3 employers/companies and their survey questionnaires were not completed and some respondents failed to provide some important answers so they had to be excluded from the data analysis.

3.5 Data Analysis

To present the profile of the employer and PSU-BS Math graduates, descriptive measures like frequency and percentages were utilized and results were presented in graphical forms (charts and graphs). For the level of competencies and degree of satisfaction, Average Weighted Mean (AVM) is used and the following were used to describe the degree of satisfaction and level of competence based on the perception of the employer. Table 2 presents the description and range used to interpret the results of the degree of satisfaction and level competencies.

Table 2: Interpretation of the Results of the Degree of Satisfaction with the BS Math Graduates and Level of Competencies on the Program Outcomes.

Description		Range
Degree of Satisfaction	**Level of Competencies**	
Very Satisfied (VS)	Very Competence (VC)	4.21 – 5.00
Satisfied (S)	Competence ©	3.41 – 4.20
Somewhat Satisfied (SS)	Somewhat Competence (SC)	2.61 - 3.40
Less Satisfied (LS)	Less Competence (LC)	1.81 – 2.60
Least Satisfied at all (LSA)	Least Competence at all (LCA)	1.00 – 1.80

Associative rules using relationship of words and word patterns were utilized to analyze the feedbacks of the employers on how to improve the graduate's skills to meet the industry's needs.

3.5 Association Rules

Association rule mining searches very important associations and relationships among words in the sets feedback (dataset). This rule presents the frequency a word/word patterns occurs in a feedback. This is analytical technique to discover how each words/word patterns are related to each other. According Sayad [33], [34] association results can be measure using:

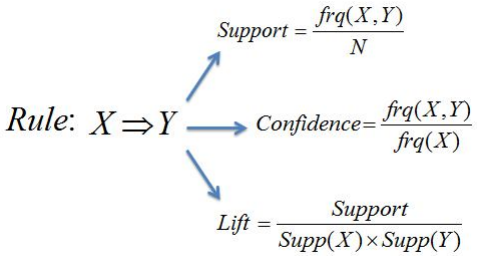

Figure 2: Common ways to measure association

- **Support**. This is a measured by the proportion of the sentence dataset in which a word/word patterns appear.
- **Confidence**. This is measured by the proportion of the sentence data set with item X, in which item Y also appears.
- **Lift**. This is to show how likely word/word pattern Y is present when word/word pattern X is appeared, while controlling for how popular word Y is. In figure 2, the lift of 1, which implies no association between words/ word patterns. A lift value greater than 1 means that word/word pattern Y is *likely* to be present if word/word pattern X appeared, while a value less than 1 means that word/word pattern Y is *unlikely* to be present if word/word pattern X appeared.

4. RESULTS AND DISCUSSION

4.1 Profile of the Employer's respondents

The breakdown of respondent companies, according to industry and legal are shown in figure 3 and figure 4. This result shows that the employers of BS Math graduates were services sector, which constitutes 89 percent, followed by manufacturing with 10 percent and agribusiness with 1 percent. Low base numbers of respondents should be noted when the knowledge and skills of the graduates considering that BS math graduate was focused on numbers or numeracy skills and analyzing data which is not lined with manufacturing and agriculture, however it can be applied in service sectors. This indicates that mathematics skills were focused more on services oriented tasks and functions such as academics, mathematics, statistics and accounting. Figure 4 reveals that the majority of these companies are private or privately owned.

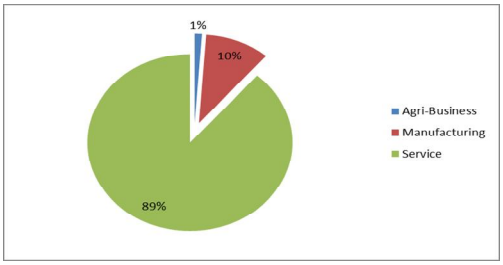

Figure 3: Distribution of respondents according to industry

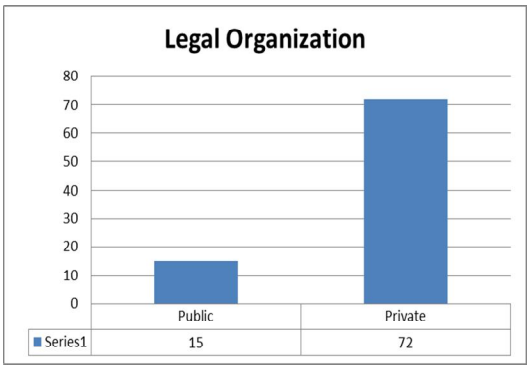

Figure 4: Distribution of Respondents According to Legal

4.2 Level of Competence of BS Math Graduates

In this study, the level of competence of BS Math Graduates as an employee is shown in Table 3. Graduates of BS Math Program from PSU found by their employees to be well – rounded with AWN of 4.5, followed by Ethically Aware with an AWN of 4.49. The competence with lowest AWN is Investigative, Independent and Critical which obtained 4.06 followed by Subject Specialist and Confident and Effective Communication. These results reveal that graduates from BS math were not competent when it comes doing research job, practical knowledge and communication skills. Previous results reveal that majority of BS math graduates were new to their workplace, this may a contributory factor to the low AWN on the level of competence. However, the Overall grand mean is 4.30 which is considered as *very competent*. The result indicates that graduate of BS Math can perform task at a targeted level of proficiency.

Table 3: Level of Competence of BS Mathematics graduates as perceived by their employer

RANK	COMPETENCIES (PROGRAM OUTCOME)	AWM	DESCRIPTION
1	Well-rounded (Listens attentively to instructions and follows orders as instructed and enthusiastic in learning skills the latest advancement related to the job)	4.50	Very Competence (VC)
2	Ethically Aware (Value and promote truth, accuracy, honesty, accountability and ethical standards)	4.49	Very Competence (VC)
3	Independent (Produces outputs on time while working with little supervision)	4.43	Very Competence (VC)
4	Adaptor (Adaptable and flexible to cope with a changing work environment)	4.40	Very Competence (VC)
5	Socially Aware (Recognize the need for, and an ability to engage in life-long learning)	4.22	Very Competence (VC)
6	Confident and Effective Communication (Possess effective reading, listening, oral and written communication skills)	4.19	Competence ©
7	Subject Specialist (Broad work mastery and practical knowledge)	4.14	Competence ©
8	Investigative, Independent and Critical (Conducts research related for continuous improvement of the organization.)	4.06	Competence ©
	Grand Mean	**4.30**	Very Competence (VC

Table 4 shows the degree of satisfaction of employee on the skills of BS Math Graduates. The degree of satisfaction was divided into A. Theoretical and Practical Knowledge in Delivering Tasks and Responsibilities, B. Trainability of Employed Graduates on the Skills Needed for the Job and Carries Positive Work Attitude such as Teamwork, Confidence, Self-Motivation to measure the degree of satisfaction as perceived by the employee. Under Theoretical and Practical Knowledge in Delivering Tasks and Responsibilities, employers found that their employee (BS Math Graduate) has a very satisfactory with an AWM of 4.25. In addition, employers found that their employee possess technical skills and knowledge needed for the job and employers are very satisfied on this area. In the area of Trainability of Employed Graduates on the Skills Needed for the Job, employees were very satisfied with an AWM of 4.43. PSU BS Math graduates found have a very satisfactory in terms of the ability to learn new skills and knowledge on the job. Overall, employers found that their employee could adapt and learn new skills, knowledge and technology or they

trainable and open for new skills dimension. For the Carries Positive Work Attitude such as Team work, Confidence, Self-Motivation, employers found very satisfactory in this area with an AMW of 4.36.

Table 4: Degree of Satisfaction on the skills of BS Math graduates

A. Theoretical and Practical Knowledge in Delivering Tasks and Responsibilities	**AWM**	**Description**
1. Possess technical Skills and knowledge needed for the job	4.33	Very Satisfied (VS)
2. Observes protocols in reporting using standard	4.19	Satisfied (S)
3. Ability to solve work related problems	4.22	Very Satisfied (VS)
Sub Total	**4.25**	Very Satisfied (VS)
B. Trainability of Employed Graduates on the Skills Needed for the Job		
1. Ability to learn new skills and knowledge on the job	4.50	Very Satisfied (VS)
2. Adapts to the existing technology relevant to the enterprise	4.33	Very Satisfied (VS)
3. Enthusiastic in learning skills the latest advancement related to the job	4.45	Very Satisfied (VS)
Sub Total	**4.43**	Very Satisfied (VS)
C. Carries Positive Work Attitude such as Teamwork, Confidence, Self-Motivation,		
1. Works well in a group to achieve a goal	4.45	Very Satisfied (VS)
2. Ability to handle stress and pressure on the job	4.24	Very Satisfied (VS)
3. Accepts other jobs other than specified on the job description	4.38	Very Satisfied (VS)
Sub Total	**4.36**	Very Satisfied (VS)

4.3 Skills Words/Word Pattens Feedback coming From The Employers

4.3.1 Skills Word/Word Patterns for Statistic Related Job

Table 5 and figure 5 shows job skills words/word patterns were dominated by technical skills such as "skills","Data", "Visualization" and "Computer". In the case of the soft skill "skills" and "communication" were the most dominant words as suggested by the employers. Clearly, the most suggested skills by the employers were "skills in data visualization" and "skills in computer". The result also reveals that the combination of "skills data visualization" has a support of 0.21 percent and a positive relationship with a lift value of 3.

Table 5: Discovered Job Skills Words/Word Patterns for Statistic Related Job as Suggested by Employers

Premises	**Conclusion**	**Support**	**Confidence**	**Lift**
Communication	Skills	0.28	1	1.64
Computer	Skills	0.22	1	1.64
Data	Visualization	0.33	1	3.00
Visualization	Data	0.33	1	3.00
skills, data	Visualization	0.21	1	3.00
skills, Visualization	Data	0.21	1	3.00

This indicates that the majority of employers suggest this new skills for their employees. In addition, "data visualization" obtained a conclusion value of .33 percent and 100 percent confidence which indicates that as employers suggested skill "data" there is 100 percent that word is "visualization" is combined. Computer Skill is also suggested by their employer as needed skill to be improved. The result reveals that a statistician's job should possess skills in data visualization and utilization of computers. The result also reveals that communication skill is also important skill as suggested by the employers.

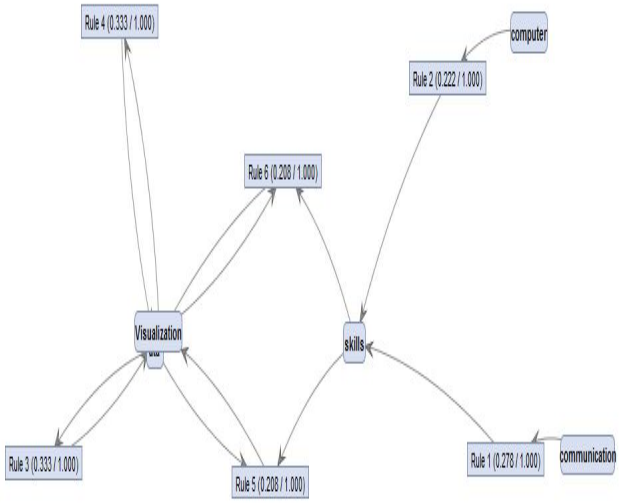

Figure 5: The graphical representation of the discovered rules of statistics related job skills as suggested by the employers

4.3.2) Skills Word/Word Patterns for Teaching Related Job

Table 6 and figure 6 shows job skills words/word patterns were dominated by technical skills and attitudes such as "communication" and "Research". In the case of the attitudes "Creative", "dedication", "Patience", and "thinker" were the most dominant words as suggested by the employers.

Table 6: Discovered job Skills Words/Word Patterns for teaching Related Job as Suggested by Employers

Premises	Conclusion	Support	Confidence	Lift
Communication	analytical	0.11	0.38	2.03
Skills	communication	0.30	0.47	1.59
skills, analytical	communication	0.11	0.60	2.03
Communication	skills	0.30	1	1.59
Analytical	skills	0.19	1	1.59
Numerical	skills	0.11	1	1.59
Accounting	skills	0.11	1	1.59

Clearly, the most suggested skills by the employers were "Communication Skills" and "skills in Research". The result also reveals that the combination of "communication skills " has a support of 0.19 percent and with a 0.44 percent confidence value with a positive relationship with a lift value of 1.55. This indicates that the majority of employers perceived that teachers should have a skills specially in communication and research. However, "Creative", "dedication", "Patience", and "thinker" all is considered as attitude attributes were also suggested by their employer as needed skill to be improved. The result reveals that a teaching job should possess skills in communication and should have the attitude "Creative", "dedication", "Patience", and "thinker" .

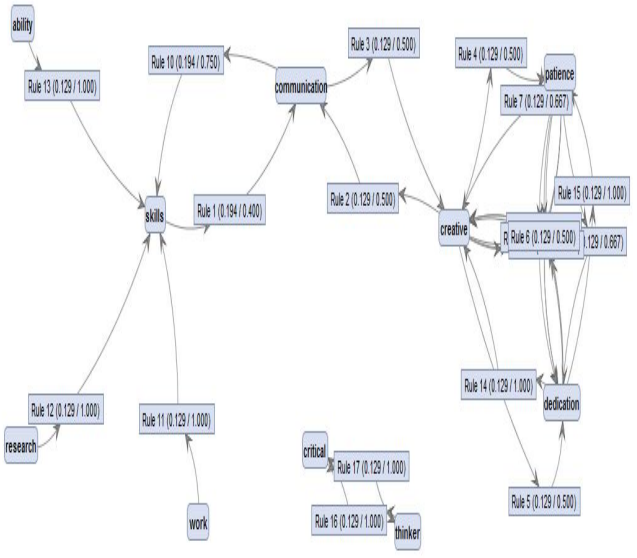

Figure 6: The graphical representation of the discovered rules of teaching related job skills as suggested by the employers

4.23 Skills Word/Word Patterns for Accouting Related Job

Table 7 and figure 7 shows job skills words/word patterns were dominated by technical skills such as "analytical", "accounting"and "numerical". In the case of the attitudes "communication" were the most dominant word as suggested by the employers.

Table 7: Discovered Job Skills Words/Word Patterns for Accounting Related Job as Suggested by Employers

Premises	Conclusion	Support	Confidence	Lift
Skills	Communication	0.19	0.40	1.55
Creative	Communication	0.13	0.50	1.94
Creative	Patience	0.13	0.50	2.58
Creative	Dedication	0.13	0.50	3.88
Patience	Dedication	0.13	0.67	5.17
Communication	Skills	0.19	0.75	1.55
Research	Skills	0.13	1.00	2.07
Ability	Skills	0.13	1.00	2.07
Dedication	Creative	0.13	1.00	3.88
Dedication	Patience	0.13	1.00	5.17
Critical	Thinker	0.13	1.00	7.75
creative, patience	Dedication	0.13	1.00	7.75
Dedication	creative, patience	0.13	1.00	7.75

The result reveals that the most suggested skills by the employers were "skills in analytical"," skills in numerical", and "accounting skills". The result also reveals that the combination of "skills in analytical and communication" has a support of 0.11 percent and a positive relationship with a lift value of 2.03. This indicates that the majority of employers suggest that an accountant should have analytical and communication skills at the same time. The result clearly shows that an accounting related job should possess skills in accounting, analytical, and numerical. In addition, communication skill is also a very important skill in the accounting related job.

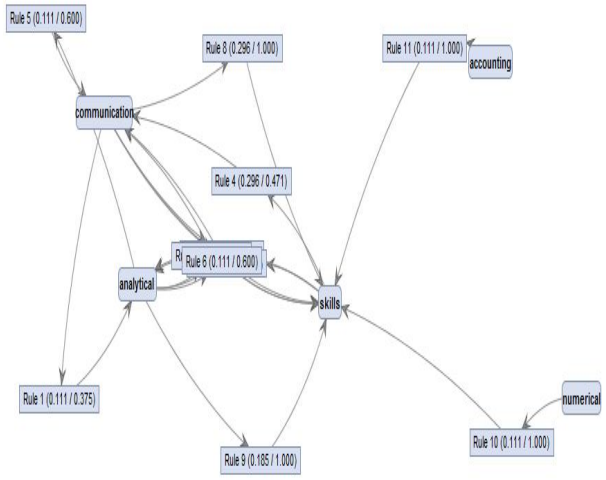

Figure 7: The graphical representation of the discovered rules of accounting related job skills as suggested by the employers

5. CONCLUSIONS AND RECOMMENDATIONS

The result reveals that the majority of our graduate was employed in a service oriented company. Furthermore, the result shows that graduate from PSU-BS math graduates are well rounded employee and competence according to their employers. In addition, they are open to be train and employers were very satisfied with their performance. They also suggested skills that are very important such as "data visualization" and "computer operation". This study also extracts job skill words / word patterns from feedback from employers of our PSU BS math graduates. This study utilized association rules to extract important job skills words/word patterns and their association or relationship on the job.

The results indicated that statistics job related needs skills in "data visualization" and "skills in computer" as suggested by the employers. Clearly, the most suggested skills in teaching related job were "Communication Skills" and "skills in Research". In addition, the result clearly shows that an accounting related job should possess skills in accounting, analytical, and numerical. In addition, communication skill is also a very important skill in the accounting related job.

Employer feedback is a very important to enhance the quality of our university graduates. Such feedback is useful in curriculum reviews and enhancement, and developing sustained relationships with stakeholders such as industry and profession. The results of this study show that the skills that employers perceived as very important in the career BS Math graduates. In addition, research on the quality of graduates in various professions is important on a cycle of curriculum content revisit based on the trends and changes in the industry which may impact course viability and relevance.

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