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Linking Ideas to the Real World: Reinvented Relationship between University and Industry in a Disruptive Digital Era

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Alumni or graduates are the indicators of a University's educational success rates. One way that a University determines how it can improve the quality of its education is by gathering information regarding their alumni through a tracer study. Tracer studies involve activities that are carried out to implement an industry-oriented educational curriculum alignment program for industrial relevance. Universities conduct ongoing research on college graduates, team work, attitude, emotional quotient, communication, basic science, IT and digital business skills, as well as creative problem solving and working skills, leadership and cohesiveness. In-depth interview study is used for obtaining data about the development and evaluation of curriculum and to develop a vision and mission for the University. Regression analyse of the variable produced by the quality of curriculum is applied in a vocational program. In order to keep pace with the ever-changing and expanding frontier of knowledge and certification, increased interest concerning the development of curriculum is desired. The goal of strategies is to promote a link between higher education and industry for various insight requirements based on attitude, skills and competency.

Key words: *Higher education curriculum, Tracer study, student competency, disruptive era.*

Introduction

The modern world has been dramatically transformed. In today's world, education, socio-economic, political and environmental problems have been redefined in terms of global connection. People have historically congregated to obtain good quality education and spend a great deal of time and energy on transferring knowledge (Arip et. al., 2012). Millions around the world receive education in a variety of ways, with some becoming successful. Developing businesses that create networks for continued learning and growth add value to society because present social networks become the core of future businesses (Grant et. al., 1996). In recent years, people have realised that the quality of education plays a key role in developing their business processes (Dous et. al., 2005). The success of higher education is an aspect of relevance (suitability). The significance of this aspect is that educational institutions produce graduates and participate in human resource development. The competitiveness of graduates is recorded based on the duration of time until they obtain their first job, the success of graduates in competing for employment selection and the salary earned. Suitability of a graduate's education is established through job profiles (type and work location), relevance of education to the job, benefits of courses for completing the job, and suggestions on ways to improving the competence of graduates (Miller, 1990). Moreover, education's relevance is also demonstrated through graduates' opinions about their overall job satisfaction, capabilities and suggestions for ways to develop curriculum for competence.

Alumni are networks that enable the role of alumni are quite significant, including being able to reduce the effects of graduate unpreparedness in applying science (Arthur et. al., 1989). The information obtained from alumni who have worked can be evidence of the success of the educational environment and the tools that support it. Vocational programs in higher educationare an improvement on vocational schools at the secondary level and on preparing resources suitable for industry (Brennan et. al., 1996). This research shows that graduate profiles include at least three necessary components: 1) accreditation requirements between types of work; 2) duration of time until employment; and 3) first salaries of graduates.

Literature Review

Tracer Study Tool Preferences of Learning Outcome

Tracer study consists of a series of sustainable systems that seek information about the limitations of educational institutions in preparing their graduates (Schomburg, 2003). The information gathered from successful graduates can help develop future strategies to improve education. The graduates' success within a profession cannot be determined without information on relevant knowledge and skills necessary to perform well at work. In addition, graduates can assess the conditions they experienced during their education (Crosbie, 2005).

Improvements to the curriculum and teaching procedures and alumni contributions can be described as an industry's reciprocal needs. Fulfilling employee qualifications as a standard for work needs can be done by simultaneously mapping information. Communication between industry and education institutions will determine and identify the quality of graduates in the workforce (Schomburg, 2003). Identifying the competency profile and skills of graduates will determine the relevance of the curriculum used within a University to identify the requirements of the labour market and professional development within the competence of a University department. Evaluating the relationship between curriculum and courses within majors as a scientific development and 4) system contribution in the process of accrediting a department (Ziegenfuss et. al., 1990).

Each educational institution must conduct a tracer study. There are at least three benefits to be gained on implementing a tracer study: 1) Determining stakeholder satisfaction (in this case graduates) based on their learning experiences as a tool to evaluate an institution's performance; 2) Obtaining information that is foundational to an institution's development based on competitiveness, quality and graduates' work experience as a way to obtain opportunities and mitigate future threats; 3) Improving relationships and alumni institutions from the experience of renowned educational institutions.

Vocational Higher Education

Vocational education programs at Universities or Higher Education institutes are specifically devoted to producing graduates who prioritise skills, work attitudes, competencies, problem solving and character in accordance with their work ethics (Adhikary, 2005). In some countries, vocational skills are prepared by training and several certifications. Universities will only provide majors if the industry requires specificity in the academic field. Whereas in Indonesia, vocational education is known for the limitations of Polytechnics in developing Science including the fields of Social Studies, Humanities and Business (Pavlova, 2009).

Vocational education also instils awareness about the fact that people need to work to live. It is meaningless if the community and students do not appreciate jobs and productive work habits. The development of a vocational education program requires co-operation, synergy and involving the full participation of stakeholder organisations that measure world industries with a certified standard (Heinz, 2009; Hiniker & Putnam, 2009). The program also requires information on industry changes for long-term strategies, responses to changes in the global economy, changes in economic and political systems and local cultures (Gleeson, 1998; Rau & Vermaelen, 1998; Brockmann et. al., 2008; Raelin, 2008), Jobert et. al. (1997) cited by Brockmann et. al. (2007), express a need for interconnections between education and work (Moodie et. al., 2009). Industry and community will be one of the parties that will be affected by vocational education at the University level, because even though the assumption

of vocational education is still on the side of Polytechnics or Engineering Sciences, current developments can be combined with Business, Humanities and Service-based knowledge, rather than only product based (Ahadzie et. al., 2009; Jacobs & Hawley, 2009; Pavlova, 2009) and prepares students to enter the workforce (Moodie et. al., 2009; Hiniker & Putnam, 2009). Vocational education should work closely with the employment industry (Hiniker & Putnam, 2009). According to Hiniker (2009), vocational education identifies the needs of a working community. Students in skill-based programs develop the expertise, knowledge, work ethic and experience required for employment.

Vocational Curriculum in Higher Education in the Digital Era

There are five models of curriculum planning, including: (a) track-based curriculum (subject-centred curriculum), (b) core curriculum, (c) curriculum-based group (cluster-based curriculum), (d) competency-based curriculum, and (e) open curriculum. Model track-based curriculum is expressly designed to distinguish between pathways to general (academic) and vocational education. Model core curriculum classifies its content into three components: core component, mandatory component, and component options. The core component should be studied by students with specific areas of expertise, whereas component options should be considered as an additional material or option. Model curriculum organises groups based on similarities between the work group and requirements for work by higher employment. Curriculum based competency with 3-2-1 system, makes a vertical alignment to the model. This is obtained from the level of education that is most appropriate or inappropriate for graduate work when completing feedback of the curriculum. It expects graduates to provide an assessment of the current level of education on campus in accordance with the tasks carried out in their current work. The response can be the same level of education, it can also state that work should be done for a higher level of education or it could also be for a lower level of education. Relationship between the field of study with graduate work explores the harmony between the education gained during college on campus and the conditions of work when feedback was conducted. The development of vocational education needs to be considered by the government in facing the digital era (Mohd Najid et. al., 2019). The readiness of the Indonesian workforce in terms of technological mastery and adequate competence is the key to success in surviving this era. Digital technology is still not evenly understood and mastered in Indonesia. Careers in this field have fairly high salary opportunities. Skills in the field of information technology are specific that will continue to be needed by the industrial sector. Technology companies are competing to recruit experts who can think creatively and innovatively.

The development of these skills should also be aimed at strengthening national industries. The number of Indonesian workers who have adequate skills will increase industrial competitiveness and add value to the capacity of the workforce itself.

Methodology

The qualitative approach emphasises aspect of quality. This means working on social and cultural meanings that are not easily measured through numbers to explain the phenomenon being studied. Qualitative research data are generally descriptive or narrative. It is clear that this approach is used to answer qualitative research questions. This study aims to find out the extent of connectivity between vocational education at the University level and the availability of jobs in the industry. There are 200 respondents who have been interviewed and obtained as data selection. The interviewees responded to structured questions and were given as follow-up questions to encourage interviewees to feely express themselves freely (Neuman, 1997). Data analysis is specifically for alumni who are already employed, with industry scope. 200 questionnaires were distributed and 180 were completed accurately while the rest did not answer due to the feedback received in the questionnaire via unreturned emails. Data was analysed using SPSS version 17, and Perception mean as well as p-value between job factors. Business type was performed to validate three curriculum competency questions related to the type of work and job factors. Examining differences in average perception scores between University and Industry in a Disruptive Digital Era of diverse classification groups. Each job and perception contribute and link to the curriculum as a core competence in vocational education based on teaching tertiary based education which includes life skills and adaptability.

Results and Discussion

The results reveal that majority of alumni are employed before they graduate and are bound to contracts that are continued from the internship period and the company's internal recruitment program (45, 25%). The data of respondents is shown in Table 1. Most have a background in Business, Humanities and Social Sciences (64.50%). About 39.50% of respondents would like to work in a multinational company. 41.5% preferred a national company and the remaining 29 % seek jobs elsewhere, such as government units, start-up companies and entrepreneurial work.

Table 1: Demographic of Respondents (sample size = 200).

Description	Information	Percentage
Age	Less than 20	2.40%
	20–21	93.10%
	22–24	4.25%
	Over 25	0.25%
Gender	Male	31.13%
	Female	68.87%
Field of study	Health	35.50%

Description	Information	Percentage
	Business, Humanities & Social Science	64.50%
Company type	IPO/National Company	41.50%
	MNCs	39.50%
Work before graduating	Yes	45,25%

Source: Author data collection, 2019

Curriculum planning becomes very important through the role of tracer study. Vocational education in tertiary institutions must be able to develop ability in the middle class of vocational classmates and other secondary education (Ojo et. Al., 2018). The curriculum focuses on work that combines life skills in accordance with educational background and the desire for lifelong learning, through creative ways and still holds ethics as a counterweight to textual abilities.

The Relevance of Curriculum to Life Skills

Employed graduates of a certain educational background answered surveys about the relevance of the curriculum to soft and life skills required by their job. 78.95% answered "yes," whereas 21.05% answered "no." Some graduates who answered "no" mentioned that life skills are most needed for non-administrative skills such as entrepreneurship, start-up and family owned companies. Additionally, several graduates maintained that life skills that support learning needs to be improved further to strengthen the applicability of vocational material in everyday life. They also suggest improving education on information technology skills and using materials such as certified skills, computers and basic science (Table 2).

Table 2: Relevance of Curriculum and Company Type

Curriculum Skills	Company type	Mean	P-value
Team work	MNC's	3.1170	.0000
	National	3.2250	
Attitude	MNC's	3.7966	.0000
	National	3.3291	
Emotional Quotient	MNC's	3.8531	.0000
	National	3.6381	
Communication	MNC's	3.5969	.0000
	National	3.8513	
Basic Science	MNC's	4.0119	.0002
	National	3.7550	
IT and digital business skills	MNC's	3.1281	.0000

Curriculum Skills	Company type	Mean	P-value
	National	3.6125	
Creative Problem solving	MNC's	3.5679	.0000
	National	3.4958	
Working skills	MNC's	3.1619	.0000
	National	3.4506	
Leadership and Cohesiveness	MNC's	3.8594	.0000
	National	3.4275	
Marketing skills	MNC's	4.1175	.0002
	National	3.7275	

*MNC's and National Company: Consisting of up 50 employees and companies already listed on the stock market.
Source: Author's data collection, 2019

Relevant Material Class to Work

Participants or alumni were asked whether the lecture material and educational background were relevant to the type of work they did. 78 % answered "yes," 6.6% answered "no," and 15.4% chose not to answer. Graduates who answered "no" state that they had difficulty in implementing integrated learning as part of social studies in vocational higher education due to trouble in learning materials in Mathematics, Accounting and Tax. Participants noted that social skill based information systems are still challenging in both theory and practice. Other graduates who said "no" mentioned that the vocational texts available for teaching communication in language skills are weak even though their class standards are that of an international school (Qiang, 2003). The graduates proposed several lectures that strongly support work (Table 3). The proposed courses delivered by graduates have been largely accommodated into a new curriculum of 3-2-1. Based on the data shown in Table 3. Faculty and University related life skill programs are outside Science Education while student attend education classes since they first register as students.

Table 3: Curriculum

No.	Competency	Program	Information
1.	Communication, Ethics, Positive thinking	Soft skills Training	University content
2.	English for business	Curriculum	Faculty Curriculum
3.	Industrial and Certified skills	Curriculum	Faculty Curriculum
4.	Entrepreneurship	Curriculum	Faculty Curriculum
5.	Leadership	Curriculum	University
6.	Working skills and Job vacancy	Job hunting	University and Faculty

Source: Author's data collection, 2019

Personal skills will contribute as supporting variables business organisation, where individuals develop organisational cohesiveness. Students learn how to become loyal employees, and work towards setting a goal. In reality, organisational culture needs to be the first priority to be developed in the workplace to build cohesiveness (Kesa et. al., 2019). To measure this situation, vocational higher education must relate to curriculum based on competency. It is surprising to note that when Communication, Ethics and Positive thinking become the main reference point to the industry needs of graduates, which this is more due to the socio-cultural system that is remains deeply rooted in Indonesian culture (Salirawati et. al., 2020). It is recommended to start at the University level to develop the above skills so that all graduates have standard behavioural and character communication standards through soft skills education. English for business is needed by the industrial world and ranks sixth, considering that not all graduates work in foreign or multi-national companies, but the ability of language is believed to improve student performance by being trained and embedded in the curriculum at the faculty level. For work skills According to job vacancies, following behaviour, work skills and competency certification form the main support, while leadership and entrepreneurship support career levels.

Conclusion

Based on the results of the descriptive analysis, students from vocational education programs share similarities and differences with alumni from other academic educations. The mostly female respondents indicated that the workforce was skillfully educated and ready for a workplace dominated by women. Statistically speaking, alumni provide input by both working in multinational and national companies and there are several aspects that must be added to the division of roles of Faculties and Universities in overcoming the shortcomings of prospective graduates including feeling that working in small, medium, and large companies is statistically different in six competencies: 1) Communication, Ethics, Positive thinking; 2) English for business; 3) Industrial and Certified skills; 4) Entrepreneurship; 5) Leadership ; 6) Working skills and Job vacancies (Moy & Lee, 2002). However, prospective graduates in special vocational education in tertiary institutions have several different views. First, team work is where students are taught how to make the best effort and co-operate in teams. Attitude is given in the context of understanding ethics and interacting behaviour. Emotional Quotient is in the form of how students are not reactive in dealing with one problem, wise in making the best decisions. Communication, a very supportive aspect of interacting in the business world, they are equipped with the ability of many languages and can apply it in daily business activities. Basic science, although it must be possessed by all students, in its role in the world of work, it plays a tertiary carrying capacity and is a refinement in problem solving. Work skills, including job skills that must be possessed by prospective graduates of leadership and loyalty that are integrated in cohesiveness. The ability to adapt to technology for example with IT and digital business skills and marketing

skills can be used as a focus for providing advanced training in the form of practicum by using a teaching factory owned by educational institutions or industry. University and Faculty both must share the roles of soft skill training, curriculum and job hunting programs. Tracer studies describe the link and match framework between educational institutions and employment. The activity must always be updated through available facts and data. The role of tracer studies is crucial in evaluating the results of graduates and the availability of jobs. The follow-up of the tracer study will be followed by revitalisation of curriculum improvement, training, certification and character education that will enable graduates to work as professionals, employers and job creators.

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REFERENCES

Adhikary, P. K. (2005). Educational reform for linking skills development with employment in Nepal. In M. Singh (Ed), *Meeting Basic Learning Needs in the Informal Sector* (pp. 215-228). Dordrecht: Springer.

Ahadzie, D. K. Proverbs, D. G. Olomolaiye, P. O. and Ankrah, N. A. (2009). Competencies required by project managers for housing construction in Ghana: Implications for CPD agenda. *Engineering, Construction and Architectural Management, 16*(4), 353-375.

Arip, M. A. S. M. Jais, S. M. Benu, A. Zakaria, M. S. Zahariman, N. H. and Ishak, N. (2012). Construction, validity and reliability of the inventory of basic religious knowledge (IBRK). Asian Journal of Assessment in Teaching and Learning, 2, 86-94.

Arthur, M. B. Hall, D. T. and Lawrence, B. S. (1989). Generating new directions in career theory: The case for a transdisciplinary approach. In M. B. Arthur (Ed). *Handbook of Career Theory* (pp. 1-25). Cambridge: Cambridge University Press.

Brennan, J. Kogan, M. and Teichler, T. (1996). Higher education and work a conceptual framework. In J. Brennan, et al. (Eds.), *Higher Education and Work* (pp. 1-24). London: Jessica Kingsley Publisher.

Brockmann, M. Clarke, L. and Winch, C. (2008). Knowledge, skills, competence: European divergences in vocational education and training (VET)—the English, German and Dutch cases. *Oxford Review of Education, 34*(5), 547-567.

Crosbie, R. (2005). Learning the soft skills of leadership. *Industrial and Commercial Training, 37*(1), 45–51.

Dous, M. Salomann, H. Kolbe, L. and Brenner, W. (2005). Knowledge management capabilities in CRM: Making knowledge for, from and about customers work. *Proceedings of the Eleventh Americas Conference on Information Systems (AMCIS 2005)* (pp. 167-178). Omaha, NE: Association of Information Systems (AIS).

Gleeson, B. (1998). Disability and poverty. In R. Fincher and J. Niewenhuysen (Eds.), *Australian Poverty: Then and Now* (pp. 314-333). Melbourne: Melbourne University Press.

Grant, S. G. Peterson, P. L. Angela, and Shojgreen-Downer. (1996). Learning to teach mathematics in the context of systemic reform. *American Educational Research Journal, 33*(2), 509-541.

Heinz, W. (2009). Vocational identity and flexible work: A contradicting or constructive relation. *Innovative Apprenticeships: Promoting Successful School-to-work Transitions*, 35-47.

Hiniker, L. and Putnam, R. A. (2009). Partnering to meet the needs of a changing workplace. In R. Maclean & D. Wilson (Eds.), *International Handbook of Education for the Changing World of Work* (pp. 203-217). Dordrecht: Springer.

Jacobs, R. L. and Hawley, J. D. (2009). The emergence of 'workforce development': Definition, conceptual boundaries and implications. In R. Maclean & D. Wilson (Eds.), *International Handbook of Education for the Changing World of Work* (pp. 2537-2552). Dordrecht: Springer.

Jobert, A. Rainbird, H. Marry, C. and Tanguy, L. (1997). Education and work in Great Britain, Germany, and Italy. Routledge, London & New York.

Kesa, D. D., Wu, M. and Ju Ko, C. (2019). Organisational power, cohesiveness and culture of Taiwan's cosmetology industry. Asian Journal of Business and Accounting, 12(2), 211-232. doi:10.22452/ajba.vol12no2.8.

Miller, G. E. (1990). The assessment of clinical skills/competence/performance. *Academic Medicine*, *65*(9), S63-S67.

Moodie, G. Wheelahan, L. Billet, S. and Kelly, A. (2009). *Higher education in TAFE*. NCVER monograph series 01/2009. Adelaide, Australia: National Centre for Vocational Education Research Ltd.

Mohd Najid, N. Tze Kiong, T. Che' Rus, R. and Budiman, H. (2019). A Needs analysis on the development of problem based learning module for the microcontroller subject at Vocational College. Asian Journal of Assessment in Teaching and Learning, 9(2), 43-53.

Moy, J. W. and Lee, S. M. (2002). The career choice of business graduates: SMEs or MNCs? *Career Development International, 7*(6), 339-347.

Neuman, W. L. (1997). *Social research methods: Qualitative and quantitative approaches* (3rd ed.). Boston, MA: Allyn and Bacon.

Ojo, A. A. Ajayi, O. A. And Ousola, F. (2018). Predicting school-based assessment practice of teachers in senior secondary schools in ijebu division of ogun state, Nigeria. Asian Journal of Assessment in Teaching and Learning, 8, 57-62. https://doi.org/10.37134/ajatel.vol8.6.2018.

Pavlova, M. (2009). The vocationalisation of secondary education: The relationships between vocational and technology education. In R. Maclean & D. Wilson (Eds.), *International Handbook of Education for the Changing World of Work* (pp. 1805-1821). Dordrecht: Springer.

Qiang, Z. (2003). Internationalisation of higher education: Towards a conceptual framework. *Policy Futures in Education, 1*(2), 248-270.

Raelin, J. A. (2008). *Work-based learning: Bridging knowledge and action in the workplace*. New Jersey: John Wiley & Sons.

Rau, P. R. and Vermaelen, T. (1998). Glamour, value and the post-acquisition performance of acquiring firms. *Journal of Financial Economics, 49*(2), 223-253.

Salirawati, D. Nugraheni, A. R. E. and Agbonkpolo, M. U. (2020). An Analysis of validity of test items in chemistry final semester examination for vocational students majoring in computer and networking engineering in Bantul Regency. Asian Journal of Assessment in Teaching and Learning, 10(1), 31-39.

Schomburg, H. (2003). *Handbook for graduate tracer study*. Moenchebergstrasse Kassel, Germany: Wissenschaftliches Zentrum für Berufs- und Hochschulforschung, Universität Kassel.

Ziegenfuss, J. T. Bentley, J. M. Trautlein, J. J. Kruger, N. R. Jones, D. and Schneider, A. J. (1990). The design and effectiveness of a graduate survey course in quality assurance and utilization review. *Quality Assurance and Utilisation Review*, 5(4). 138-143.