Modeling Research Competency of Faculty Member : A Preliminary Data

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Abstract

Research productivity of higher education institutions (HEIs) in Indonesia lags behind those in other countries in the region, that implicates their reputation. Because in aggregation, research productivity of HEI is the productivity of its faculty members, thus research competency of faculty members might be the factors that cause the low research productivity of those HEIs in Indonesia. Focusing on Faculty economics and Business, this paper aims to develop the model of research competency for faculty member. This paper show the analytical process used by author in modeling research competency using behavioral event interview (BEI). The preliminary data used in this paper consist of two subjects, the effective and outstanding performer, out of minimum seven respondents that have been targeted. The findings reveal that outstanding performer tend to show more people-focused behavior than task-focused behavior. It is consistent with the previous studies of competency modeling for professional / knowledge workers.

Keywords : Research competency; competency model; behavioral event interview (BEI)

■1.0 INTRODUCTION

This paper is written based on author's concern on the fact that research productivity of higher education institutions (HEIs) in Indonesia lags behind those in other countries in the region, such as Malaysia, Singapore and Thailand. Because most international ranking agencies (one of them, is Quacquarelli Symonds-QS, based in London), put high weight on research indicators (Buela-Casal, et.al,2006), thus, low level of research productivity of HEIs in Indonesia affect their reputation, which are seen from the rank of those HEIs among other international HEIs (see table.1).

Table 1 Comparison between Country-level research productivity ranks, HEIs- level research productivity rank and HEIs ranking.

Higher Education Institution (Country)	National-wide HEI's ranking	Total documents per February 2014	Avrg per year (2011-2013)	QS World ranking (Sept 2013)
National University of Singapore (Singapore)	1	80,454	5,607.7	24
Nanyang Technological University (Singapore)	2	48,856	4,605.3	41
University of Malaya (Malaysia)	1	23,864	2,922.0	167
Mahidol University (Thailand)	1	21,470	1,585.0	283
Universiti Sains Malaysia (Malaysia)	2	18,880	2,619.7	355
Universiti Putra Malaysia (Malaysia)	3	18,396	2,721.3	411-420
Institut Teknologi Bandung (Indonesia)	1	3,394	494.3	461-470
University of Indonesia (Indonesia)	2	2,973	343.0	309
Gadjah Mada University (Indonesia)	3	1,707	197.0	501-550

Source: data from http://www.scimagojr.com, www.scopus.com, and www.topuniversities.com compiled by author.

After all, because research productivity of higher education institution (HEI) is the aggregate number of research conducted by its faculty member (Ju, 2010), thus, research productivity of HEI also reflects the performance of its faculty member (Hesli & Lee, 2011; Kotrlik, Bartlett, Higgins, & Williams, 2002). Low level of performance might be caused by the lack of ability. In this case, the ability of faculty members are correlated with level of education. Recapitulation data of higher education database (PDPT =Pangkalan Data Perguruan Tinggi) from Directorate General of Higher Education (Dikti), reveal that education level of faculty member of higher education institution in Indonesia ranging from 2-year diplomme to doctorate, and majority have already had master degree. Since doctorate program is believed as the substantial training for developing research competency (Byrne & Keefe, 2002), From figure 1. we can assume that only 12% of faculty members in Indonesia that have already occupied with such capability of research.
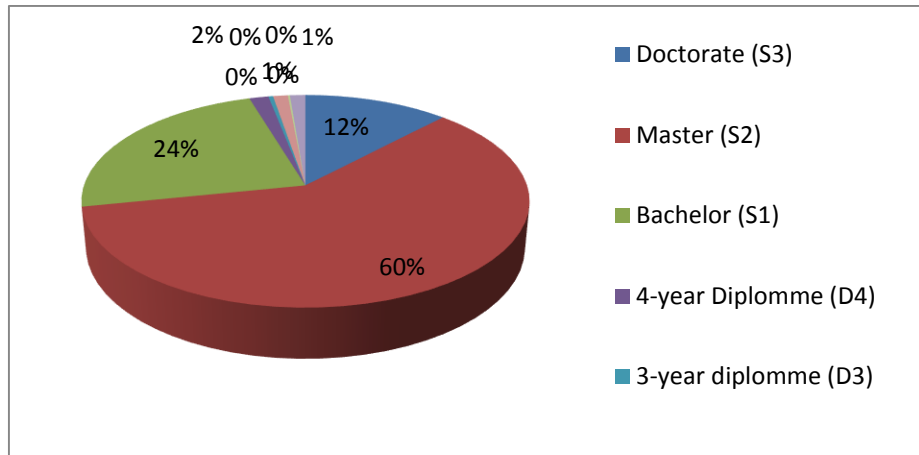
Figure 1 Composition of faculty member based on level of education
Source : https://pdpt.dikti.go.id/, accessed June 2014

In general, competency of faculty member can be seen from the status whether they have been professionally certified or not. Regulation of Minister of National Education No. 47 in 2009 stated that to be certified, faculty member have to be assessed in form of portfolio, perceptional assessment by student, colleagues and supervisor, and also self-assessment. The competencies that are assessed includes pedagogic, professionalism, personality, and social competency. The faculty member that have been certified, is considered competent, so that they will received additional pay called benefit of profession. However, the assessment of the certification use very minimum standard of research, even more, there is no specific competency of research that being assessed.

From the phenomenon above, this paper aims to develop the model of research competency for faculty member. This paper will show the analytical process used by author in modeling research competency using preliminary data that have been collected from two faculty members in one faculty of economics and business in Indonesia. This paper is focusing on faculty of economics and business because, based on data in scimagojr.com, for the proportion of research productivity among disciplines in Indonesia, disciplines of Economics, econometrics and finance only produce 125 documents in 2011-2012 and lies in the 18th position among other disciplines, while Business, Management and Accounting field lies in the 19th position with only 116 documents in 2011-2012 out of 24 disciplines. It means that those disciplines needs to be examined more thoroughly, because the problem relatively worse compare to other disciplines. Because those two disciplines traditionally in Indonesia are under Faculty of Economics and Business, so that this research will focus on the Faculty of Economics and Business in Indonesia.

■2.0 THEORETICAL FOUNDATION OF THE STUDY

Concept of Competency

Concept of competency influenced by McClelland articles in 1973, and practically given example by his work for United States Information Agency (Spencer & Spencer,1993; Lucia and Lepsinger,1999). He criticized the traditional academic and aptitude tests that according to him, have failed in predicting job performance or success in life, and were often biased against minorities (Spencer & spencer,1993). McClelland (in Spencer & Spencer, 1993) propose the use of criterion samples, who clearly had successful job, and identify the behaviors that causally related to the successful outcomes.

Competency is defined as "an underlying characteristic of an individual that is causally related to criterion-referenced effective and/or superior performance in a job or situation" (Spencer & Spencer, 1993: 9). It is the way of behaving that is consistently used to achieved desired performance, that differentiate the superior performer with effective performer (Spencer & Spencer,1993; Dubois & Rothwell,2004). According to Spencer & Spencer, effective performance (sometimes called as average by Spencer & Spencer,1993 or successful performance by Dubois & Rothwell,2004) is minimally acceptable level of work. The effective performer successfully meet the standard, but not outstanding (Dubois & Rothwell,2004). Superior performance (called as exemplary performance Dubois & Rothwell,2004) defined as one standard deviation above average performance (Spencer & Spencer,1993). It can be seen as ideal performance or level of performance that be desired in the future but still possible to be achieved in the present time (Dubois & Rothwell,2004). To prevent ambigue interpretation, in this paper, the term effective (for effective or average) and outstanding (for superior or exemplary) performer will be used.

The discussion of competency concept often fall into debate whether minimum requirement to do the job can be called competency. Most studies agree that competency is the characteristics that lead to superior performance. The minimum requirement for the job, sometimes called as competence (Dubois & Rothwell,2004), categorized as threshold. It is required to do the job, but can not differentiate superior performer from effective performer.

Competency Modelling

Before McClelland, psychologist John Flanagan in 1954 have develop techniques called critical incident interview, which attempted to identify critical traits and skills required for successful performance (Lucia and Lepsinger,1999). Nonetheless, the critical incident technique

restrict only to the observed behavior that is witnessed by the interviewee, it doesn't involve experiences and perceptions of the interviewee (Lucia and Lepsinger,1999). Therefore, McClelland's method followed by most scholars and practitioners to determine competencies, although later many different methods evolved from the original McClelland's (Lucia and Lepsinger,1999).

There are three major approaches used to identify competencies : (i) Modified task analysis approach (MTAA), (ii) Critical trait approach, (iii), Situational approach (Dubois,1993). The MTAA is method that quite similar with task analysis that is the people already familiar with. However, this methods only useful for less abstract jobs (Dubois,1993). The second approach, the critical trait approach is the approach used by McClelland. It is later called The Job competence assessment method (JCAM) (Dubois & Rothwell,2004) or Behavioral Event Interview (Spencer & Spencer, 1993). The result of this method is a detailed description of a number of critical incidents on the job which already consider interviewee's thought and feelings (Boyatzis,1982). The third approach has emphasis on the situational context used in developing the competency model, so that it can be acceptable and comfortable to users (Dubois,1993).

The Job Competence Assessment Method (JCAM), becomes the most respected method since it is pioneered by David McClelland him self, that is credited for coining the term "competency". It is also called the classic method (Spencer & Spencer,1993), that required quite rigid procedure and takes times more than other methods. It is consist of six steps (Spencer & Spencer,1993) : (i) define performance effectiveness criteria; (ii) identify criterion sample; (iii) collect data; (iv) analyze data (using thematic analysis) and develop the model; (v) validate the model; and (vi) prepare the application of competency model (into HR management function). Although Spencer & Spencer (1993) gives five alternatives, includes : BEI, panels, survey 360o ratings, expert system database and observation, but behavioral event interview (BEI) considered as the best method to grounded-theoretically generate the competency. According to Dubois and Rothwell (2004), in BEI, the criterion samples be interviewed about critical events in their work experience. The session is taped and later, researcher prepare the verbatim of the interview. From written transcript, the researcher then identify the characteristics revealed during the interview by coding the transcript using qualitative data analytical method (Dubois & Rothwell,2004).

Research Competency

Derived from the definition of competency, in this paper, research competency is conceptualized as faculty member's characteristics that lead to outstanding level of research productivity. Research competency of faculty members mostly gained from doctoral education and usually developed in their first employment through mentoring(Byrne & Keefe,2002). Thus, many literature that discuss about research competency written in the context of academic curriculum, training and assessment. For example, Trierweiler and Stricker (1992) that develop research competency model for the need of training for local clinical scientist (clinical psychology). They emphasized the acquisition of knowledge in their model, as a learning outcome of the training. Similar with Trierweiler and Stricker (1992), Madan-swain,et.al (2012) develop research competency for doctoral level using the cube model or three dimensional framework used to develop the competency model. They devide the competency into two clusters : knowledge-based / foundational competencies and applied / functional competencies. Because the study related to the curriculum for doctoral education, so that the form of competency mostly in form of acquisition of knowledge and skill or apply some particular tasks related to research, not the behavior.

Turan and Sayek (2012) have include ability in their model although in a very basic form, because the context of their study is in undergraduate medical school. However, they also include quite advance competency for undergraduate level such as ability to review journal articles; ability to critique journal articles; ability to compose a manuscript for publication and ability to lead in a research project team. Similar with Turan and Sayek (2012), Adkison and Glaros (2012) also conducted study in the context of undergraduate di medical school They develop competency models as a criteria for assessment. There are three clusters : medical knowledge, interpersonal and communication skills and professionalism with total of six competencies, namely: project understanding, technical skills, attention to details, analytical ability and professionalism, companied by behavior indicators that should be demonstrated by student during education program.

Literature that written in context of faculty member for instance from Harris and Parish (2007) that develop core competencies for family medicine educators. It comprises of seven clusters of competency, and research is one of the clusters. The national Postdoctoral Association (NPA, 2009) of United States (US) develop six core competencies that are meant to serve as both a basis of self-evaluation and a basis for developing training for postdoctoral scholars. So this framework can be called as threshold for postdoctoral scholar. Because postdoctoral training is the most advance training for academic especially as researcher, so we can assume that the framework will be close enough to an ideal competencies of researchers. Faculty of General Dental Practice (UK) (2007) has developed research competencies framework for their faculty. It is usefull to elaborate real context of faculty. The framework consists of five domain : practical skills; problem-solving, thinking and communication skills; personal attitudes and professional ethics; dissemination and roles and functions.

From those literatures, added by competency related to information literacy adopted from Miller (2010), the deductive model of research competency is developed. The competency derived from literature mostly written in task-based approach rather behavior approach, it is because most of literature discuss the model of curriculum that consists of several task that have to be done by the student or is derived from list of assessment criteria of faculty member. The deductive model should be further explored using behavioral event interview to extract the behavior aspect of competency, that have not been revealed, yet. The extracted model will comprise of behaviors that are not possed by the effective performance, only those who are superior performance who have those behavior.

■3.0 METHODOLOGY

Research Design

This research adopted procedures suggested by Spencer and Spencer (1993). There are several steps that be conducted in this research, include:

1. Identification of criterion of outstanding performer and effective performer of research of faculty member
2. Identification of who belongs to outstanding performer group and effective performer group
3. Conduct behavioral even interview to extract behavior from each group, based on task list in deductive model.
4. Comparing set of behavior between two group

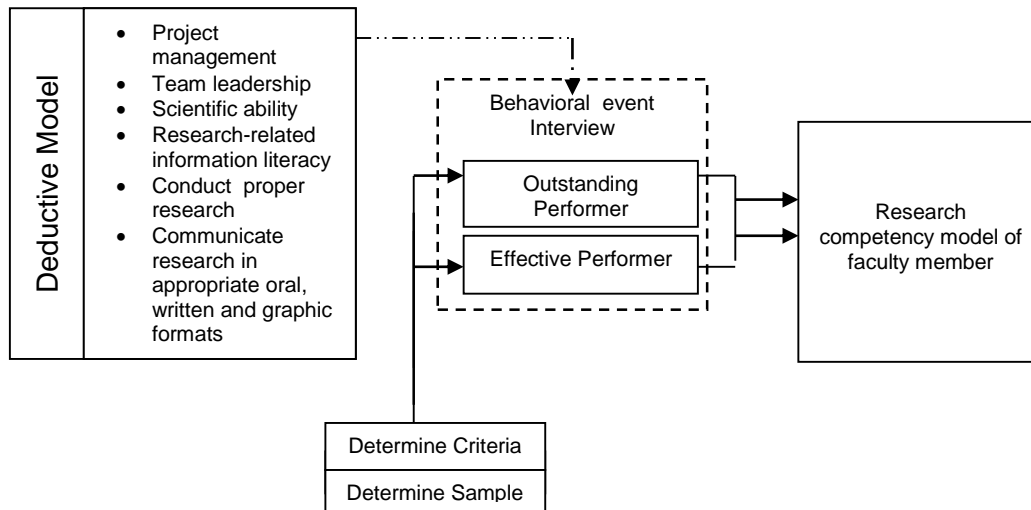5.   Extract the set behavior that represent the outstanding performer

Figure 2 Chart of process the development of research competency model

Participants

Criterion used in this research to determine those who are effective performer, adopt the criterion of the requirement of Lecturer Work Load demanded by the directorate general of higher education in Indonesia, which is at least publish minimum one research per year (quality of the outlet not be determined, accept for the calculation of credit for rank promotion process). According to Spencer & Spencer (1993), the outstanding performer is the job incumbent that have value of one standard deviation above the mean, which is 19 to 48% of output, measure by economic value. Since research output of faculty member in Indonesia can not be directly converted into its economic value, so that it is not applied in this research. Instead, authors tend to agree with what Dubois and Rothwell (2004) say about outstanding performance, that it can be seen as ideal performance, the desired performance in the future that is still possible to achieved in the mean time. This research based on the problem of research productivity, so in author opinion, it is appropriate to take the ideal performance of the researcher as the criterion for the outstanding performance. There are two conditions should be met by outstanding performer in research : quantity of publication and quality. For the quantity aspects, total quantity of publication and the outlets where the article be published, become consideration. For the quality aspect, the citation become the criterion to be considered.

     Number of respondents to be interviewed according to Dubois and Rothwell, vary from at least 6 to 12 individual job incumbents for each job be studied. Spencer and Spencer (1993) suggest to use proportion of 4:3 for superior and effective performer. Thus, author aims 7 minimum number of samples. So far, author have interviewed two respondents, 1 for the effective performer, the other considered as outstanding performer. Both respondents come from the same institution, but have different major / discipline.

■**5.0 RESULTS AND DISCUSSION**

Each interview was transcribed into verbatim to be analyzed. As suggested by Spencer & Spencer (1993), each interview is treated as qualitative study, so that to compare all model from each interview, we should use "common language". Competency dictionary from Spencer and Spencer (1993) that consists of 350 behavior indicators, used in this research as those "common language", plus the indicators from deductive model generated by author. So the interview transcript, be coded using the dictionary in the basis of behavior indicators as "the lowest common denominator" (Spencer and Spencer,1993).

     For example, when an outstanding performer be asked about how they successfully collaboratein writing papers, especially with foreigner. The interviewee, answered :

> *I usually work with foreigner professionally, means that the relationship should be mutual. How to achieve equal position with other scientist? We have to identify smartly, what can we offer to them. For example, we know that the person is expert in methodology, and we have data regarding Indonesia (that not all foreigner scientist can access that), we can tell him that he can use my data, "you can do this, do that", and so on. And also in reverse, I think it is obvious the benefit for us, working with the foreigner. So, we have to identify the benefit for them and try to sell it.*

  From that answer, the analyst noted that it contains :
  ⇨   Use oral and written communication to express ideas effectively (Col6)
  ⇨   Offer help and support to other researchers (Col8)
  ⇨   States confidence in own ability (SCF A.3)
  ⇨   Calculates the impact of one's action or words (IMP A.4)

⇨   Makes cost-benefit analyses (ACH A.6)

Lucia and Lepsinger (1999) remind us to avoid some pitfalls such as lacking a consistent interview protocol; seeing what you want to see; if you've seen one, you've seen them all; and relying solely on the incumbent's perception. For example, when the interviewee be asked about what does he think his colleague, subordinate and supervisor see him. The interviewee answered : " *I think, they see me as perfectionist*". The the interviewer probe," *what incidents that might cause you are seen as perfectionist*?", then he answered, " *I think because quality control. My standard is high, we are developing our reputation, we can not fail the standard, especially deadline. One weakness in our institution that the researchers are not full-timer. They only do research as part-time job, so that they have many reasons to be late to finish their job. So I push them, remind them, tell them what to do. I think that's why I think for my colleague I am perfectionist*". From the answer we know that the interviewee does not talk about perfectionist as theoretically defined. Instead, from his explanation we can conclude that he manage the timeline of project (PM3), monitors other's work (CO4), demands high performance (DIR A.4), and creates own measure of excellence (ACH A.3).

The thematic analysis result total 77 appearances of behavior for effective performer and 80 for the outstanding one. It generate 57 and 62 unique behavior for each effective and outstanding performer. The data from thematic analysis then were organized by the importance weight in descending row, based on the frequency of the appearing those such behavior in the interview (Spencer & Spencer,1993). From this steps, it is revealed that for effective performer, top five competencies are team leadership (most important); project management; achievement orientation; concern for order and quality; and scientific ability (least important), while for outstanding performer, the most important is serve as role model, followed by flexibility, achievement orientation, developing others, and team leadership.

The data then were tabulated to extract the behavior that differentiate outstanding performer from the effective one. In tabulation of data, this research use the procedure proposed by Dubois & Rothwell (2004). The result of thematic analysis categorize into three set. The first set are those behavior indicators that used by both effective and outstanding performer. This set categorized as threshold, a minimum characteristics required to do the job. The second set, are those that cited by outstanding performer but not by effective performer. This set contain behavioral indicators that differentiate the superior / outstanding performer from the average or effective performer, or what we call as competency. The third set comprise those behavior that only cited by the effective performer. This set should be discarded from the result because they are not used by the outstanding performers even to achieve at minimum requirement (Dubois & Rothwell,2004).

Table 2 Categorization of data from thematic analysis

Competencies	Effective performer	Outstanding performer	Category
Team Leadership			
Promotes team effectiveness (TL. A.4)	xxxxx	xx	Threshold
Lead research project team (TL1)	x		Discard
Motivating others (TL2)	x		Discard
Uses authority fairly (TL A.3)	x		Discard
Communicates a compelling vision (TL A.7)		xx	Competency
Develop research skill of team member (TL3)		x	Competency
Takes care of the group (TL A.5)		x	Competency
Project Management			
Conduct project planning (PM1)	xx		Discard
Establishing priorities (PM2)	xx		Discard
Manage project timeline (PM3)		x	Competency
Locates funding sources (PM4)	x	x	Threshold
Manage personnel needs and deployment (PM5)	x	x	Threshold
Data and resources management (PM6)	x	x	Threshold
Achievement orientation			
Creates own measure of excellence (ACH A.3)	xxx	xx	Threshold
Achievement impact : individual performance only (ACH B.1)	xx		Discard
Achievement impact : affects a department (ACH B.4)		xx	Competency
Set challenging goals (ACH A.5)	x		Discard
Makes cost-benefit analyses (ACH A.6)		xxx	Competency
Concern for Order and Quality			
Shows a general concern for order and clarity (CO2)	xxxx		Discard
Keeps an organized workspaces (CO 1)	x		Discard
Monitor others' work (CO 4)	x	xx	Threshold
Develops systems (CO 6)		x	Competency
Table 2 (continued)			
Scientific Ability			
Review and critique journals articles (SA4)	xx	x	Threshold
Formulate a research question (SA1)	x	x	Threshold
Design hypotheses (SA2)		x	Competency
Recognize and know when to use primary and secondary resources (SA7)	x		Discard
Ability to select, apply, and interpret data-analytic strategies that are the best suited to the diverse research questions and level of analysis characteristic (SA8)	x		Discard
Contribute to theory within a particular area of study (SA11)		x	Competency
Analytical Ability (SA12)	x		Discard
Collaboration			
Participates in professional societies and networks with similar research (Col2)	x		Discard
Understand research role and expected contribution within team (Col5)		x	Competency
Use oral and written communication to express ideas effectively (Col6)	x	x	Threshold

Offer help and support to other researchers (Col8)		x	Competency
Developing rules, expectations, and evaluations for collaborations (Col9)	x		Discard
Sharing data with collaborators (Col10)	x		Discard
Ownership and access to data (Col12)	x		Discard
Information literacy			
Conduct a literature search using electronic resources (IL1)	x	x	Threshold
Find relevant literature effectively (IL2)	x	x	Threshold
Read, understand, evaluate, and organize information resources (IL3)	x		Discard
Incorporated relevant literature into a project (IL4)	x		Discard
Recognize when information provided is sufficient (IL5)		x	Competency
Observe and record behavior (IL6)	x		Discard
Information seeking			
Does research (INF 5)	xx		Discard
Uses own ongoing systems (INF 6)	x	x	Threshold
Involves others (INF 7)	x		Discard
Conduct Research			
Prepares research proposal (CR1)	x		Discard
Effectively develop a research strategy using the classic planning process (CR2)	x		Discard
Efficiently collect, organize and analyze needed qualitative and quantitative data (CR3)	x	x	Threshold
Know how to modify techniques, if appropriate, for changes in conditions (CR4)		x	Competency
Perform research ethically (CR5)	x		Discard
Communicate research			
Present research findings in scientific forum (Com1)	xx		Discard
Publish in international journals (Com4)	xx	x	Threshold
Relationship Building			
Makes work-related contacts (RB A.2)	xxx	x	Threshold
Directiveness			
Gives detailed directions (DIR A.2)	x		Discard
Speaks assertively (DIR A.3)	x		Discard
Demands high performance (DIR A.4)		x	Competency
States consequences of behavior (DIR A.7)	x		Discard
Flexibility			
Sees situation objectively (FLX A.1)		xx	Competency
Flexibility applies rules or procedures (FLX A.2)	xx	xx	Threshold
Adapts tactics to situation or to other's response (FLX A.3)		xx	Competency
Adapt own strategies, goals or projects to situations (FLX A.4)	x	x	Threshold
Makes organizational adaptation (FLX A.5)		x	Competency
Teamwork and cooperation			
Shares information (TW A.2)	x		Discard
Solicits inputs (TW A.4)	x		Discard
Empowers others (TW A.5)	x	xx	Threshold
Analytical thinking			
Break down problems (AT 1)	x		Discard
Sees multiple relationships (AT A.3)	x		Discard

Table 2 (continued)

Makes complex plans or analyses (AT A.4)		x	Competency
Makes very complex plans or analyses (AT A.5)		x	Competency
Publication literacy			
Publication literacy	xx	x	Threshold
Conceptual thinking			
Applies complex concepts (CT A.3)		x	Competency
Creates new concept (CT A.5)	x		Discard
Self-confidence			
Presents self forcefully or impressively (SCF A.2)	x		Discard
States confidence in own ability (SCF A.3)		xx	Competency
Justifies self-confident claims (SCF A.4)		x	Competency
Initiative			
Shows persistence (INT A.1)	x		Discard
Addresses current opportunities or problem (INT A.2)		x	Competency
Self-motivation : makes extraordinary efforts (INT B.5)		x	Competency
Developing others			
Expresses positive expectations of others (DEV A.1)	x		Discard
Gives reasons or other support (DEV A.3)		x	Competency
Reassures and encourages (DEV A.5)		x	Competency
Does Long-term coaching or training (DEV A.6)		xxxx	Competency
Delegates fully (DEV A.8)		x	Competency
Serve as role model			
Promote research and scholarly activities within the academic unit, and/or university (Rol1)		x	Competency

Teaches research skills to students and faculty (Rol2)		xx	Competency
Values research in decisions affecting annual reviews and promotion / tenure (Rol3)		x	Competency
Demonstrate an appreciation of the necessity and value of research (Rol4)		xx	Competency
Engage and serve the general public (Rol6)		xx	Competency
Advance and promote the discipline by participating in public and professional service activities (Rol7)		xx	Competency
Advance and promote the discipline by participating in partnerships with government agencies, foundations, and/or non-profit organizations (Rol8)		x	Competency
Profesionalism (Rol9)	x		Discard
Customer service orientation			
Takes personal responsibility (CSO A.3)	x		Discard
Acts to make things better (CSO A.5)		x	Competency
Addresses underlying needs (CSO A.6)		x	Competency

The result of this research provide interesting findings. Turns out the outstanding performer tend to shows more people behavior than task behavior. For validation, model that was generated from this research was being compared with other model (Spencer & Spencer,1993). From their research, Spencer and Spencer generates five   generic models, one of them is generic model for professional, includes the researcher as one of jobs that be studied. According to their research, professionals or knowledge workers that identic with technical knowledge-related jobs, who deal primarily with technology and data rather than with person, turn out have one-quarter characteristics related to interpersonal and managerial. Spencer & Spencer's finding support the findings of this research. The outstanding performer in this research also driven mostly by passion and concern for bigger problems, rather than driven by individual achievement target.   It is also consistent with previous study from Fuller in 1999 that cited by Dubois & Rothwell (2004) that found the passion belongs to outstanding performer.

■6.0 CONCLUSION

This paper have shown the analytical process of developing research competency model for faculty member using preliminary data that represent two criterion samples, the effective performer and outstanding performer. From the result and discussion, it is revealed that that outstanding performer tend to show more people-focused behavior than task-focused behavior. It is consistent with the previous studies of competency modeling for professional / knowledge workers.

This research has two potential implications. First, from this research we can identify the threshold for research that should have been equipped by each individual researcher. The threshold model will become a good feedback for the curricula of education institution, especially for graduate level. Secondly, the competency model that differentiate the outstanding performer from effective performer, that were generated in this research, can be used by institution to be a guidance in conducting development program and also assessing its faculty member.

As have been explained, that this paper is based on preliminary data that only use two respondents, so that it becomes the flaw of this paper. The result could not be generalized,yet. More samples are needed to validate the findings. The finding also need to be granulated into compact model of competency. It can be helped by conducting validation using other methods, such as Subject Matter Expert Survey / panels or Focus Group Discussion (FGD).

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