VALIDATION OF INFORMATION TECHNOLOGY READINESS MODEL: A FOCUS GROUP STUDY

[1]MOHAMAD IRFAN, [2]SYOPIANSYAH JAYA PUTRA

[1]Lecturer, Departement of Informatics Engineering, Sunan Gunung Djati State Islamic Unversity, Bandung, Indonesia

[2]Lecturer, Departement of Information System, Syarif Hidayatullah State Islamic Unversity, Jakarta, Indonesia

E-mail: [1]irfan.bahaf@uinsgd.ac.id, [2]syopyan@uinjkt.ac.id

ABSTRACT

This article reveals how an opinion or argument is applied to validate the model of Information Technology (IT) implementation readiness using inductive-qualitative method rather than ongoing hypothesis testing. This study is intended to elaborate and validate the model of focus group study (FGS) in order to weigh the disadvantages and advantages of this study models. Most researchers validate model by quantitative method. There are not so many researchers who validate the model with qualitative method, even some researchers are not aware of using this method. This article is very beneficial, especially to describe, explain, prove, and explain the context and condition that model validation has been done qualitatively before the researcher conducted quantitative validation. The research finding represents three points of model validation regarding the modeling process, methodology, and recommendation for implementation. This will be a good reference point for researchers who are going to validate the feasibility of their models, especially using qualitative validation method.

Keywords: *Validation model, Information Technology, Focus Group Study, IT Readiness Model, Qualitative Methology*

1. INTRODUCTION

After making modeling the question that often arises for researchers is how to measure the validity of a new research model? This question makes sense as the model is made from the results of adoption, adaptation and combination that are feasible to be implemented in research. Most of the feasibility measurement process is conducted quantitatively by doing a pretest and pilot study to validate the model that has been made, which is in accordance with the study of Information Systems [1], [2]. Researchers may have carried out qualitative research to find research weaknesses and shortcoming so that they can find efforts to improve the research; analyze a possibility, facts, and events during the research process; compile a hypothesis relating to the concepts and principles of education based on information and data that occur during the research process [3], [4]. Apart from the researchers' qualitative assessment, however, most of doctoral students, make qualitative research as a procedure for completing research reports by conducting focus group studies (interview, consultation, discussion, or seminar) to explore

specific problems related to topic of discussion. This objective of this technique is validating the created model [5], [6].

This article expresses the work of FGS in understanding the validation of IT implementation readiness model and exploring information, concepts or ideas in research, based on the perspectives of participants who have competency, information, knowledge, interest and research experience in the IT/IS field [7],[8]. Here are the research questions raised in this study:

Research question 1: How to understand the validation of the proposed model?

Research question 2: How to explore the feasibility of the proposed model at the research phase?

The research findings show the necessity to methodological aspects to validate the model and research feasibility recommendations to continue the next research phase [1], [9]. In addition, this article contributes to providing additional perspectives for researchers in the IT/IS field about the use of methods in validating research model. This article consists of an introduction, Literature review of previous studies, the next discussion on the proposed model as the object to be studied, the

used method to validate the model (FGS, Research process, data analysis techniques, result and analysis), result and discussion and finally research conclusion.

2. LITERATURE REVIEW

One reason that qualitative research method applies is that human have uniqueness or social symptoms that cannot be analyzed by statistical method [10]–[12]. Qualitative research method emphasizes observational study and FGS dialogue method (interview, discussion and consultation) in the place of research and the data are analyzed by non-statistical method [7], [9]. FGS is a qualitative data collection technique designed to obtain information on desires, needs, perspectives, beliefs and experiences of participants on a topic, with a moderator direction [6], [13], [14]. The qualitative approach stresses the meaning and understanding of verstehen, reasoning, the definition of a particular situation (in certain contexts), and researching everyday life activities. The qualitative approach is more concerned with the process than the final result; therefore the sequence of activities can vary depending on the condition and the number of available symptoms.

Qualitative research in IT/IS field is similar to other studies, which is aimed to develop and construct studies or theories about IT/IS, the process of preparing initial designs, making research instrument, determining discussion teams, conducting discussion and evaluating discussion result [15], [16].

Moreover, unlike in other disciplines, such as marketing and health, the use of FGS in IT/IS studies has not been widely used, particularly in validating the research model. Some researchers state that aspects of validity are important aspects in every discipline [17]. This reflects how the system is modeled in a quantitative and qualitative way to build model trust and confidence in the impossibility of absolute acceptance. In particular, in qualitative inquiry, validity refers to whether the research findings accurately reflect the situation and are supported by evidence [18]. This description is shown by many scholars who indirectly conclude the validity of popular success model in their studies using a number of previous study literature on the same topic [19],[20].

In short, as many scholars have pointed out about the important role of research participants who share the same interests, skills, knowledge and experience, this key information may make sense to be involved in FGS to ensure the validity of the research findings [1],[21],[22].

3. PROPOSED MODEL

This model development was inspired by previous model development research [23]–[25] following for the trend of developing models from Nur Mardhiyah Aziz [26] and Zen Framework [23], [27], studies showing that most are research models tend to be developed practically using the previous model rather than based on empirical studies. Generally, this model was developed by adopting, combining, and adapting technology readiness [24], [28]–[34] models with seven variables, namely IT Content (ITC), Institutional Context (INC), People (PPL), Process (PRC), Technology (TCG), Service Quality (SVQ) and IT Implementation Readiness (ITIR).

Here is the proposed Readiness model to measure the readiness of IT implementation on HEI.

Referring to previous research [7], [23], [24], [28], [32], [35]–[37] which uses input-process-output logic (IPO) in the development of research model, researchers assume that the combination process and the adoption of readiness can also be assumed in the logic mentioned above. Conceptually, IT Content and Institutional Context are Inputs from the developed model, while People, Process, Technology and Service Quality are the phases of the process of developing the readiness model, while ITIR is for IT implementation and the output of the process.
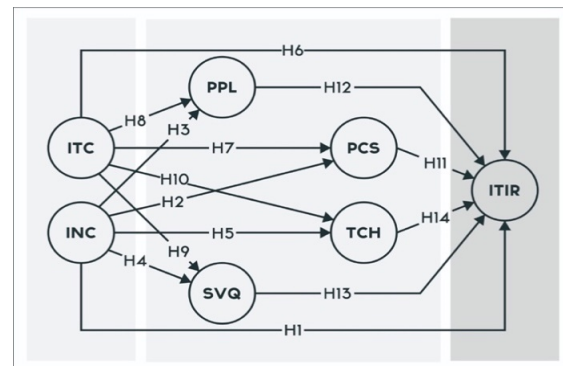

Figure 1. Model ITIR

The used model allows revisions based on quantitative and qualitative assessments using the skills, knowledge, and experience of participants

involved in the focus group study and based on a pilot study survey. The implementations of the sequential-mixed validation method may have justified the model validity, as it was revealed by many mixed method literatures. Figure 5 shows the sequential stages of the model development and its revisions.
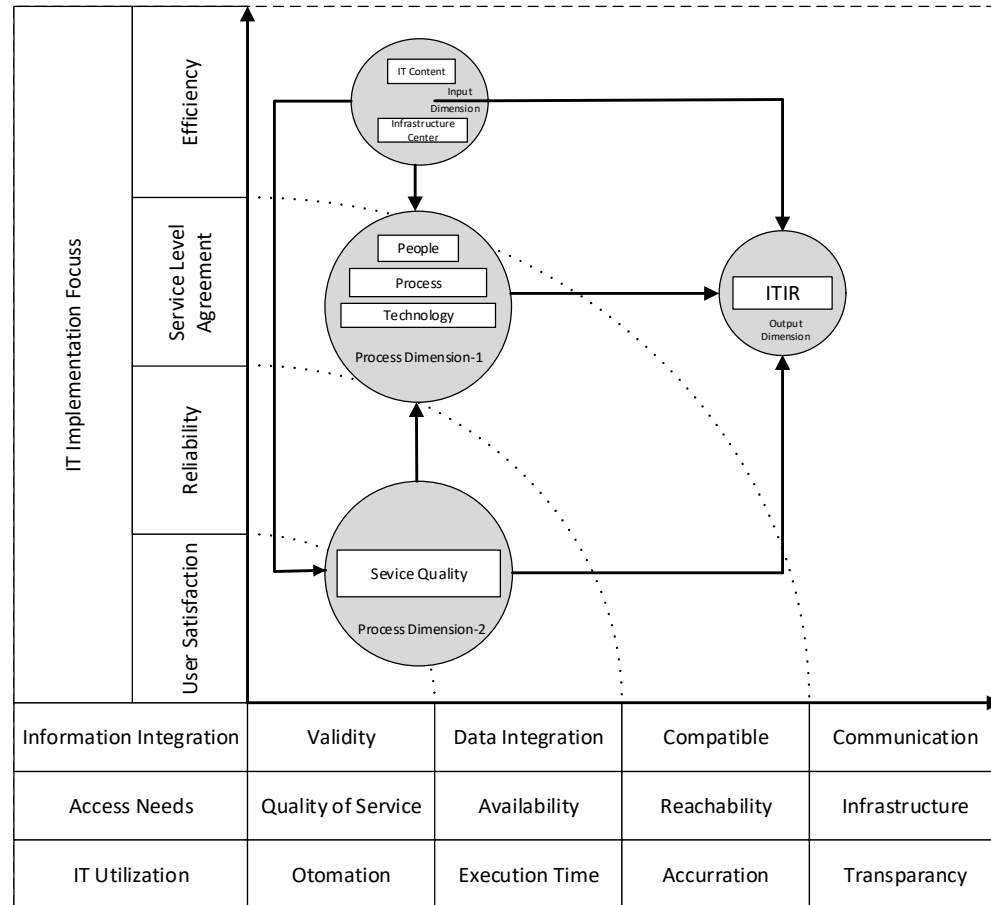

Figure 2. Conceptual Framework

4. METHODS

4.1 FGS

As a research tool, FGS can be applied as a scientific research method. Moreover, FGS can be used in various domains and purposes [38], for example (1) decision making, (2) needs assessment, (3) product or program development, (4) knowing customer satisfaction, and so on. FGS is aimed to explore experience data through capitalizing interaction from participants using individual interview, consultation, discussion, and seminar that have concentration, interests, skills, knowledge and experience in the IT/IS research field [39], that covers academics, doctoral students, PhD candidate, and the AeU campus research group. The number of participants who have focused and effective involvement in the FGS are 18 people (see Figure 3).
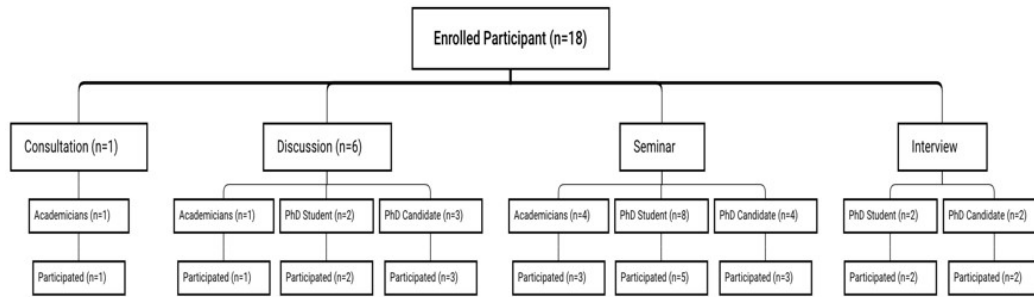
Figure 3. Distibution of participant

Interview; this technique was conducted at the initial stage of this study involving six participants: three doctoral students and three doctoral candidates. The researchers used informal interview to explore and analyze the context of individual or organizational participants in developing research program. Interviews were conducted 2 to 3 times; in which each took around 60 minutes using a questionnaire (see Table 1).

Table 1. List of Interview Questions

No	Questions
1	How to validate a research model?
2	How to prepare a research model validation?
3	What are validation criteria of a valid model?
4	What are the criteria of a feasible model?
5	How do you validate your research model?
6	Is it possible to use only one method, for example, the qualitative method, in a model validation?
7	What are the strengths and weaknesses of this single implementation?

Consultation; this technique is done to get personal information from experts. Consultation was conducted to obtain information on research related to the model, which was carried out conditionally based on the readiness of sources, at least one week one consultation with experts during the research. The consultation is aimed at clarifying and understanding theory and practice and exploring the impact and results of research [17] through face-to-face meetings, e-mail, or telephone calls in accordance with the agreement.

Discussion; this technique is conducted 3 times before making a 60-minute seminar session for each meeting. The discussion involved four to five doctoral students, including moderators in the research group.

Seminar; the seminar is conducted through collaboration among researchers, practitioners, departments, and university. Therefore, the performance and procedures of this seminar formally follow institutional guidelines.

4.2   Research Process

The empirical study covers five stages: preliminary study, data collection, data analysis, interpretation, and report writing (see Figure 4)
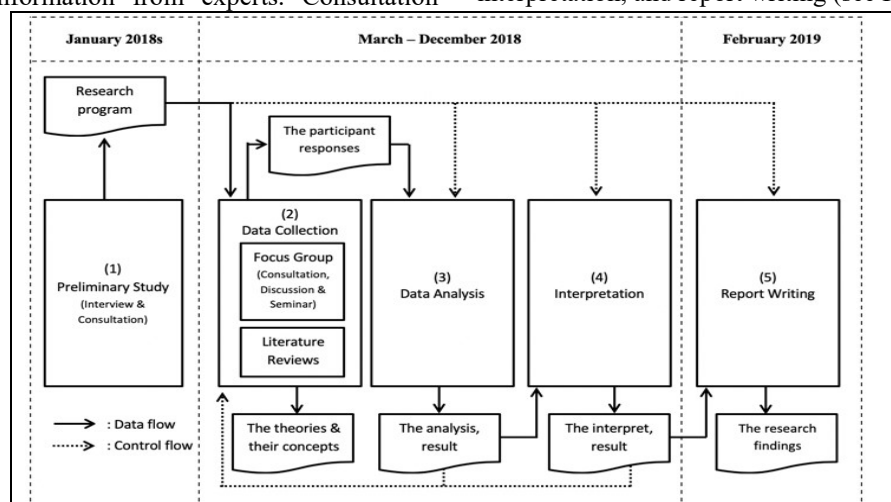

Figure 4. The research process

Stage 1: Introduction; this stage was done during January 2018 by interview and consultation techniques to get the right information for the next research phase.

Stage 2: Data collection; based on the research program developed in the first phase, this stage is exploring the participants that take part in research, and the information was obtained through three FGS techniques, namely, consultation, discussion, and seminar.

Stage 3: Data Analysis. At this stage, the researchers performed three recurring stages through data management, descriptive, and explanation [18]. In the data collection, this iterative process was also carried out throughout February to October 2018, and the results cover eight themes formulated (see Table 4) as the basis for interpretation.

Stage 4: Interpretation. The researchers used a brief interpretation approach to understand the FGS results [40]. The result shows a coherent generalization of the theme regarding the research question. This interpretation was conducted from February to December 2018.

4.3 Data Analysis Techniques

As suggested by [5], [39], the researchers conducted data analysis using three techniques in the iterative process during the study. The research tool used is Microsoft Office 2016, specifically Microsoft Office Word and Microsoft Office Excel. The three techniques cover data management, descriptive account, and explanatory account. First of all, researchers conducted data management activity through reviewing, labeling, sorting, and summarizing data to reduce raw data. Second, researchers identified, mapped, and classified key dimensions, and developed typologies to conceptualize themes according to research questions. The eight themes are then determined at the end of this article. Third, in the explanation, the researchers tell why the data takes the found and presented form. In summary, the focus of this stage is to analyze the content, context, and evaluation of data regarding the answers to the research questions.
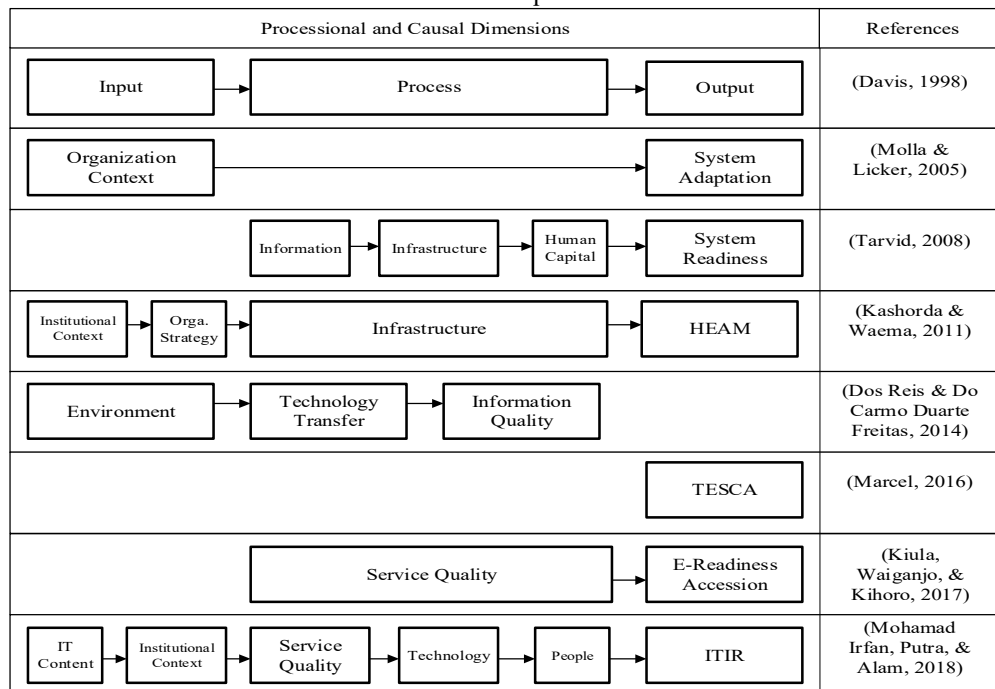

Figure 3. The processional and causal models

4.4 Result and Analysis

The analysis of qualitative data and the results of interpretation reveal seven overall themes (see Table 2) in four types of FGS and literature studies. These themes address the issue of validity (the first four themes) and feasibility (the last three themes) with respect to two research questions. Moreover, a number of sub-themes are identified and discussed in the description of eight main themes.

Table 2. List of the Formulated Theme

No	Questions
1	Development of the proposed model
2	Distinctions of the model among the previous models
3	Contributions of the proposed model
4	Focus of the model
5	Complexity of the proposed research model
6	Implementation of the research method
7	Time consumption of the research performed

Research Question 1: How to understand the validation of the proposed model?

Four of the eight themes formulated represent this research question, including the development, differences, contributions and focus of the proposed model. The description in table 3 explains these four themes.

Table 3. List of FGS Theme

Thema	Result
Theme 1: *Development of the proposed model*	1. This modeling is made by combining, adapting and adopting existing models using Input-Process-Output logic to produce a new model, which is theoretically possible to use this logic because SI is related to Computers. It is necessary to make only additional references to strengthen the compatibility of the IPO logic for model development (see figure 3). 2. To ensure that the model is in line with the research objectives, each variable must represent the IT implementation function in HEI, each indicator of the variable is well understood by the user, so that this model can be a reference in measuring implementation readiness. 3. From the proposal (literature study), it is very good to see the trends that are happening in HEI, especially the use of IT in academic activities. Whether this model can meet HEI's expectation, regarding government regulations that require academic periodic reports, in particular. A: Conceptually, it can be represented, because the assessed aspects of readiness cover process, technology, people and needs of the HEI.
Theme 2:	1. The distinction from other
Model difference between previous models	models is clearly seen after being presented by researchers, this model exists from adoption, adaptation and combination of e-readiness model and smartcampus native framework from Indonesia 2. When Looking at proposal, it is apparent that the adopted, adapted, and combined models with their complete references can make the development of the next model easier. 3. What new things will appear? Although there are terms of adoption, adaptation and combination of models, the developed model can predict HEI readiness for IT implementation. The reference for making this model is mostly taken from developing countries, so this model is not only used in Indonesia but also in other developing countries
Theme 3: *Contribution of the proposed model*	1. The theoretical contribution is very significant when viewed from the field of research, because Indonesia does not have a readiness model to measure IT implementation readiness in higher education. This, of course, becpmes a positive achievement for academics, researchers and practitioners. 2. Practical contributions must be initially tested, because there are not developed models for IT implementation in HEI in Indonesia, but the IT practical development in high education will be very meaningful. 3. Does HEI need a model that can predict implementation readiness in HEI? Based on government policy that HEI IT must be integrated with the government, it is certain that IT development in university must have readiness in terms of governance, technology, processes, services etc.
Theme 4: *Model focus*	1. The presented model represents the theory and needs of IT and HEI. The model is taken from e-readiness, service quality, IT content, instutional context and Zen framework. At least, the above references are taken

from the readiness of Technology, especially IT and the framework of smartcampus based on IT utilization.

2. It is imperative to clearly define the difference between models, frameworks and tools
According to ZEN framework is used to describe possible actions or show the chosen approach to an idea/thought. The conceptual framework (theoretical framework) is a type of intermediate theory that tries to connect to all aspects of inquiry (for example, definition, purpose, literature review, methodology, data collection and analysis). The conceptual framework can act like a map that provides coherence for empirical investigations. Because the conceptual framework has the potential to be so close to empirical investigation, it takes different forms depending on research questions or problems. On the other hand, according to Subiyakto model is something that is used in any way to represent anything. Some models are physical objects, for example, a toy model that can be assembled, and can even be made to work like the object it represents. Meanwhile, the conceptual model is a model that stays only in the mind. The used conceptual model helps us know and understand the subject matter it represent.

Research Question 2: How to explore the implementation feasibility of the proposed model at the next stage of research?

Three of the eight themes were interpreted and classified in this second research question (table 4), including the complexity and scope of the model, application of the research method, and time consumption of research performance. The following section explains the interpretations of these themes.

Table 4. List of FGS Theme

Theme	Result
Theme 1: *Complexity of the proposed*	1. How many variables are ideal for the model? There is no definite reference for the
research model	number of variables that determine the feasibility of the model, but this model has 7 variables and 40 indicators that may have their own obstacles in getting all data due to the big area of Indonesia and the number of HEIs in Indonesia, this condition should be considered well when collecting data. 2. The hypothesis can sufficiently represent the purpose of the study, as there are 14 relationships between variables that will be assessed using the smartPLS method, so it is not too difficult to make analysis. However, there is needed to add a relationship between ITC→INC to ensure that all variables are well connected. 3. Evaluation is used to ensure that the model is theoretically and practically feasible in using a mixed method that starts with pretest using quantitative method, and quantitative result is then confirmed by qualitative method, followed by case study with quantitative method which is tested again by qualitative method to test the anth hypothesis relationship.
Theme 2: *Implementation of research method*	1. How to efficiently distribute questionnaire to get 300 sample data from all Higher Education Institution in Indonesia? using media websites, social media and media paper is the possible way. The sample is seen to be very representative because it represents HEI from all regions in Indonesia. Public and private HEI, colleges and universities have their own data. 2. Does the factor of experience and position affect the results of the survey assessment? Indeed, because the top manager holds key information about IT implementation in HEI that is related to institution policy. In short, the experienced people will help campus to implement IT properly and correctly

Theme 3: *Time consumption for research performance.*	1. When Looking at the produced model, it takes much time for research due to the big area of Indonesia, how to make effective model? 2. The model is seen to be proper, not too simple and complex, so that this research can be completed immediately, with the consistently research implementation. 3. To get interesting look, it is necessary to add the hypothesis of the relationship between INC and ITC.

5. DISCUSSION

This article illustrates how the research model is validated by qualitative inductive method (continual hypothesis testing). The research theme questions can be explored by means of FGS method, this is in line with the researcher [41], [42]. This qualitative method is very effective and efficient for obtaining information that is in accordance with research needs considering the process of modeling, theoretical foundation, resources availability, methodology, context and conditions of research [39]. The following paragraph describes the four validation points as described above.

First, the fact states that the theoretical foundation is the important factor for the research success that formulates the model [43], because the developed model at the time of research uses previous theories, as described and represented from the FGS results of the first four themes, namely development, contribution, context and complexity [44].

Second, most participants of FGS assess the feasibility of the used methodology, so that the model has feasible implementation for research in the terms of appropriate method, technique and procedure. This is in accordance with Blaxter's response, about the aspects of the feasibility of the research implementation [6].

Third, to ensure the success of further research, regarding the researchers readiness, the available and used resources become the most important capital within the research [6]. This relates to the theme of the complexity of methods implementation and consumption of research time.

Fourth, to ensure the developed model validation, FGS participants must understand the first four themes. This seems to be a challenge especially for doctoral students, because the way

how the model is adopted, adapted, combined and compared requires good literature and conceptual understanding [44], [45]. Furthermore, model validity is supported by accurate academic evidence.

In summary, the theoretical concept and exploration of previous models, the contribution and involvement of participants in FGS, and the methodology application became the main points in this study [9], [44]. Furthermore, the dynamic and interaction during the FGS become the success points of exploring previous models so that they are compatible for further research. The results of this study can change in the other times when looking at the context, participant interactions and the used literature.

6. CONCLUSION

This article reveals how the validation of IT implementation readiness model in HEI applies qualitative method, explores FGS through interview, consultation, discussion and seminar. 18 (eighteen) participants took part at least in one of the 4 FGS sessions. At the stage of data collection and analysis, the authors formulated seven themes, namely, development, difference, contribution, focus, model complexity, application of research method, and time consumption during the research. Furthermore, these seven themes are theoretically represented and coherently generalized into four validation points to answer the research questions, namely the modeling process, theoretical basis, methodology, and availability of research resources.

The exploration of FGS is very significant in describing and providing new information to validate the model for research performance. So, the contribution of FGS is very specific and focuses on the explored data and information in providing a statistical difference between qualitative and quantitative methods.

We fully realize that the validation using qualitative method within FGS procedure has limitations regarding the subjectivity of participants, understanding and knowledge of participants, the used method, concluding the obtained information that will influence the results of validation model. The point of this research is the need for a validation process in a concrete and objective manner and the diverse participants provides a combination of valuable information, so as to correct deficiencies and complement other studies in making a perfect model validation. Therefore, it is necessary to take a look at nother different research perspectives. Validation study of

this model is still on going and the results of this study can be used as a case study or pilot study.

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