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Riding the Practice of Technopreneur Development: Key Motivating Factors to Participate and Graduate in Technopreneur's Masters Programs

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Abstract: Technopreneurial potential of graduates has become one of the national agenda and has been attracting the interest of policy makers, educationists and development agencies. In this respect, a major expectation has been placed upon higher education to play a leading role in generating enterprising graduates in general and into self-employment in business in particular through scientific research. In Malaysia, the numbers of graduate students participate in technopreneur development and incubation programs (TEDIP) are still far below the expectation and financial allocation by the government. This study aims to identify key the influencing factors among participants to participate and to remain in the TEDIP, as well as to construct new discovery that contribute to the knowledge on technopreneur development (TED). Mix method research was applied in the study. The samples were chosen based on judgment sampling i.e. government and Malaysian IHL key informant for the primarily study to define the research Problem; and sampling frame which comprise of Master of Technopreneurship participants in Malaysian IHL for both quantitative and qualitative study. The quantitative data was completely collected through electronic questionnaire survey using ShareSurvey software. To ensure the internal consistency reliability of the data, all data gathered from surveys were tested with Cronbach's alpha. Descriptive analyses were used to analyze and summarize data including of frequency and central tendency. Feedback from quantitative study was used to design unstructured interview form for the qualitative study which can sharpen the clarity of results, strengthen the validity of findings, and enhance the credibility of conclusions. On the basis of finding, the model developed will hopefully help the TED organization to increase the number of participants in TEDIP. The policy makers and the TED agencies may utilize this result to develop further TED program in the country.

Keywords: Entrepreneurship, Technopreneurship, Technopreneur Development and Incubation Program

I. BACKGROUND OF THE RESEARCH CONTEXT

Academic communities are required to support the development of new products and enterprises through scientific research (Chiriacescu, 2007). In this respect, a major expectation has been placed upon higher education to play a leading role in generating enterprising graduates in general and into self-employment in business in particular. Thus, entrepreneurship education for young people is perhaps the most powerful hint in youth development today. Entrepreneurial potential of graduates also has become the national agenda and has been attracting the interest of policy makers, educationists and development agencies (McLarty, 2005; Malaysia, 2014). Therefore, Malaysian government bodies and local universities have been keen to promote TEDIP and spending enormous sums of time and money trying to develop graduate entrepreneurs since 1999 to present.

Previous observation shows that government support in term of study scholarship allocations was reduced from 30 participants for each batch in each program in 1999 to 20 participants in 2007, 10 participants in 2010, and to none in 2016. Initial formal interview with key informant i.e. the government and related IHLs reveals that the reducing number of scholarship allocation and budget for each batch and each program by the government was caused by the decreasing number of candidates applied for the TEDIP. Therefore, to identify issues within the problem, the researchers have proposed a research questions i.e.

1. What are the factors that have influence the current participants to participate in TEDIP in Malaysia?; and
2. What are the factors that motivate the TEDIP participants to remain in the program?

II. LITERATURE REVIEW AND RESEARCH FRAMEWORK

Malaysian government has chosen to be open and pragmatic in dealing with changes, and was committed to develop creativity, innovation and entrepreneurship through SKIT and MOST programs. From the review, the researchers found that most of the key components of both SKIT and MOST i.e. teaching factory, industrial internship, incubation process, mentoring, industrial visit, and experiential learning, are recognized by most previous researchers (Moerwismadhi, 2012; Technopolis, 2011; D'Este and Perkmann, 2011; O'Shea *et al.,* 2007; D'Cruz, Shaikh, and Shaw, 2006; Klandt, 2005) as keys element for entrepreneur development. Some of these key attributes are also familiarly used by other institutions on their TEDIP i.e. Florida Institute of technology (D'Cruz, Shaikh, and Shaw, 2006); San Jose State University (Basu, 2006); Hunter Center for Entrepreneurship (US, 2014); Stanford Technology Venture Program (SU, 2014); Entrepreneurship and Innovation Program, MIT Center for Entrepreneurship (MIT-Sloan, 2015); and Nanyang Technopreneurship Center (Tan, Lim, and Toh, 2004; NTU, 2015); and CMI (Acworth B. and Ghose, 2006). With liuterature study and prior theorical knowledge, the researcher has identified Four (4) groups of factors which is match to the empirical observation that might influence the respondents to participate and to remain in the TEDIP i.e the person, development environment; support environment and implemantation as shown in Table 1.

The 'person' attributes are put into four categories,i.e. experiences (Sternberg, 2004; and Hynes, 1996); self-efficacy (Bandura, 1997; Heinonen and Poikkijoki, 2006); entrepreneurial spirit (Osborne and Gaebler, 1993; Ward and Ward, element2011; Kawasaki, 2011) and skill (Battle, 1990; Patton and Griffin, 1981; Hisrich, Peter, and Shpeherd, 2005). The development environment element are classified into two categories

Table 1
Four groups of key factors which is match to the empirical observation that might influence the respondents to participate and to remain in the TEDIP

Entrepreneur/ Participant	*Development Environment*	*Support Environment*	*Implementation*
a) Entrepreneiral Spirit	a) Institutional environment	a) Government support	e) Policies and practice
b) Experiences	• Organizational culture	b) Industrial -Linkages	f) Organizational climate
• Education experience	• Resource availability	• Technological Opportunity	g) Managerial role
• Industry experience	• Organizational structure	• Market opportunity	h) Financial resources
c) Skills	• Intrapreneurship	• Business Network Opportunity	i) Managerial commitment
• Interpersonal Skill	b) Training Environment/	• Venture capital	j) Managerial skill
• Entrepreneurial Skill	• Teaching Factory/ Incubation Process	(Financial assistance during start-up)	k) *High Turnover*
• Technological Skill	• Faculty/trainer quality	c) *Family background*	l) *Cultural change*
• Management Skill	• Mentoring/ Coaching	d) *Economic condition*	
d) Self- Efficacy	• Course structure		
• Leadership	• Course length		
• Opportunity obsession	c) *Program information*		
• Motivation to excel	d) *Program Content / Modules*		
• Commitment and Determination			
• Creativity	e) *Master Degree Offered*		
• Self-reliance			
• Ability to adapt			

including: institution environment (Matheson, 2006; and Antonic and Hisrich, 2003); and training environment (Hynes, 1996; and Solomon, 2007; Cruz *et al.,* 2002; Klandt and Muller-Bolling, 1993; Klandt, 2005; Fiet, 2000). Another three (3) key atributes that have been identified from the pretest as essential for the intertenal environment element that might influence the participant to participate in the TEDIP are program information; program contents/modules; and level/type of degree offered. The support environment element are classified into two categories i.e. government support (Malaysia, 2009); and industrial-linkage (Prathaban and Shankar, 2003). Another two (2) support environment elements identified throught the pre-test are family background and socio economy. On implementation element, the research refers to Klein and Sorra (1996) and Klein and Knight (2005) overview since not many prior researches have been discusses on the issue. However, after the pretest and interview with the key informers, only six implementation atributes from Klein and Sorra (1996) and Klein and Knight (2005) will be analyze in this topic since the 'learning orientation' has focused on training environment. In addition, through the pretest and interview with the key informers, the researchers have identified another key element that should be taken into consideration during the implementation process i.e. high turnover of management and culture

change. The high turnover of management key element focuses on high replacement of the program management in very short term before the TEDIP participants completed their courses. While, cultural change key element focuses on the issues that argue on the readiness of the program participants to be developed as Technopreneur, and TEDIP management to change from traditional entrepreneurship program management to Technopreneur management.

III. RESEARCH METHODOLOGY

Samples of the research were chosen based on judgment sampling for qualitative study i.e. the Malaysian government and IHL key informants for the primarily study to define the research problem; and sampling frame which comprise of Master of Science Technopreneurship participants in Malaysian IHL for both quantitative and qualitative study to identify key influencing factors that encourage the respondents to participate in the TEDIP and motivate them to remain in the program. The quantitative data was collected through electronic questionnaire survey using ShareSurvey software. To ensure the internal consistency reliability of the data, all data gathered from surveys were tested with Cronbach's alpha. Feedback from quantitative study was used to design semi-structured interview form to interview the TEDIP participants for the qualitative study, which can sharpen the clarity of results, strengthen the validity of findings, and enhance the credibility of conclusions. Overall, there are 28 face-to-face in-depth interview; 24 phone interview; and 14 through online SKYPE interview; while other TEDIP participants do not respond to the interview requested by researchers. Results of the study are explained in detail in the next section.

IV. FINDING AND DISCUSSION

The outcome of the alpha value is at λ =.939. There were two scale types of quantitative data gathered for this research i.e. nominal data and ordinal data. Thus descriptive analyses were used to analyze and summarize data including of frequency distribution and central tendency. Summarization of respondents profile is shown in Table 2.

Table 2
Respondents Profile

Characteristics	*No. of Respondents*	*Percent*
Gender		
Male	45	46.9
Female	51	53.1
Total Number of Respondents	*96*	*100.0*
Age Group		
22-25	19	19.8
26-30	37	38.5
31-35	25	26.0
36-40	13	13.5
More than 40	2	2.1
Total Number of Respondents	*96*	*100.0*

contd. table 2

Characteristics	*No. of Respondents*	*Percent*
Personal Life Before Joining the TEDP		
Just graduated & haven't been involved in any business	28	29.2
Fresh graduate & involved in ICT business	16	16.7
Entrepreneur with a good none ICT business.	12	12.5
TE with a good ICT business.	11	11.5
Termination of employment.	9	9.4
Fresh graduate & involved in non ICT business	8	8.3
I have quit from my business enterprise.	2	2.1
TE with a good none ICT business.	2	2.1
Other	6	6.3
Total Number of Respondents	94	97.9
Missing System/ No respond	2	2.1

(A) Key Influencing Factors to Participate in the Program

The central tendency analysis on key factors which influence participants to participate in the TEDIP is shown in Figure 1. With overall maximum answer at 5.0, the results show that business network opportunity expected through the program is the most influential of all factors with the higher Mean (X= 4.00). In descending order the next influencing factor is entrepreneurial spirit (X=3.77); good market access opportunity expected through the program (X=3.73); self-efficacy (X=3.70); strong financing support opportunity expected through the program (X=3.69); the master degree offered by the program (X=3.56); contact network/people respondent knows/family (X=3.52); interpersonal skills (X=3.48); program brochure/information (X=3.44); program contents (X=3.41); previous education experiences (X=3.40); management skills (X=3.39); previous industry experiences (X=3.28); entrepreneurial skills (X=3.07); technological skills/special know how (X=3.02); respondent has just graduated and have no plan during that time (X=2.58); and unemployment/ termination of employment (X=2.46). Other factors from Table 2 have been rated at 2.0 and below.

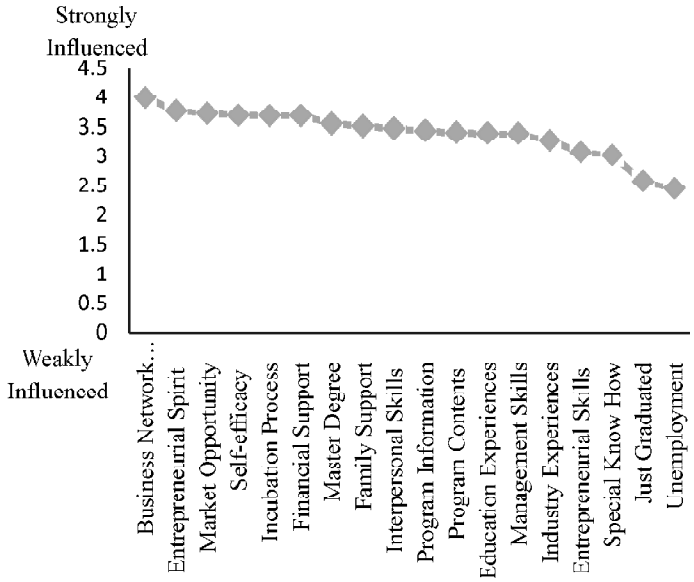

Figure 1: Influencing factors to participate in TEDIP

From both quantitative and qualitative study, the results show that business network opportunity expected through the program is the most influential of all factors which include entrepreneurial spirit, good market access opportunity, self-efficacy, strong financial support opportunity, incubation process, the master degree being offered by the program, and contact network or people know by the respondents. As stated in the literature review, the business network and social or financial resources are important factors in entrepreneurial high tech development (West & Bamford, 2005). Availability of resources, such as time, financial, human and social capital as well as technology are vital for the emergence and development of opportunities (Sanz-Velasco, 2006) which will also support the entrepreneurial behavior (Hornsby et al, 2002). Self-efficacy has been specifically noted as key predictor of a person's engagement to entrepreneurial activities. This is because people who have higher self-efficacy tend to be more willing to take up challenges and show persistency in dealing with obstacles (Bandura, 1997). They have more competitive advantage and skills that enable them to be more self-reliant, creative, motivated and committed in the endeavor or task they partake (Timmons and Spinelli 2007). Figure 2 shows the primary and secondary influencing factors of TEDIP participation based on respondents' feedback.

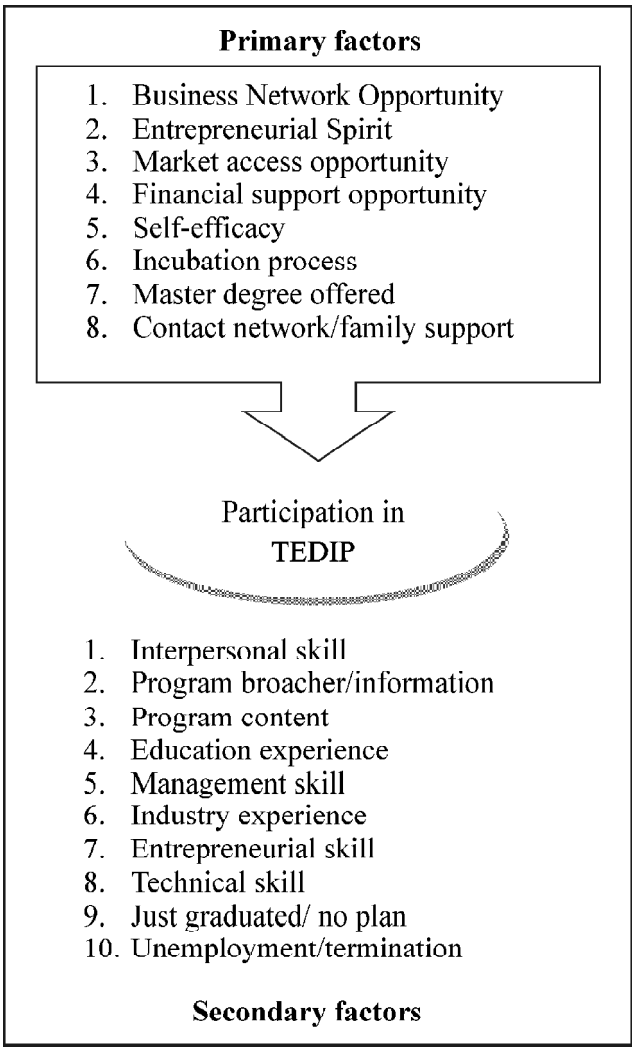

Figure 2: Influencing factors to participate in TEDIP in Malaysian IH

(B) Key Motivating Factors to Remain in TEDIP

With maximum answer at 5.0 from strongly disagree to strongly agree, researchers found 15 main factors that motivate the participants to remain in the current TEDIP. In descending order the factors are master degree offered with the higher Mean at (X=4.46); motivation to excel (X=4.38); entrepreneurial spirit (X=4.32); opportunity obsession (X=4.18); commitment and determination (X=4.09); business network opportunity (X=3.92); mentoring/coaching (X=3.88); managerial commitment (X=3.72); venture capital/final support/grant opportunity (X=3.66); government support (X=3.62); organizational culture (X=3.58); economic condition (X=3.56); Participant Cultural Change (X=3.52); and Self-reliance (X=3.50); Detail result is shown in Table 3.

Table 3
Motivating Factors to Remain in TEDIP

No	*Key Factors*	*N*	*Max*	*Mean*
1.	Master Degree	96	5	4.46
2.	Entrepreneurial Spirit	96	5	4.38
3.	Motivation to Excel	96	5	4.32
4.	Opportunity Obsession	96	5	4.18
5.	Commitment & Determination	96	5	4.09
6.	Business Network	96	5	3.92
7.	Mentoring/coaching	96	5	3.88
8.	Managerial Commitment	96	5	3.72
9.	Managerial skill	96	5	3.66
10.	Grant opportunity	96	5	3.66
11.	Government Support	96	5	3.62
12.	Organizational Culture	95	5	3.58
13.	Economic Condition	96	5	3.56
14.	*Participant Cultural change*	96	5	3.52
15.	Self-reliance	96	5	3.50
16.	*Family background*	96	5	3.42
17.	Participants Experiences	96	5	3.36
18.	Participants Skills	96	5	3.31
19	Program Content/Structure	96	5	3.28
20	Leadership	96	5	3.26
21	Organizational climate	94	5	3.19
22	Ability to adapt	96	5	2.98
23	Trainer quality	96	5	2.92
24	Incubation Process	96	5	2.86
25	Resource availability	96	5	2.83
26	Creativity	96	5	2.75

contd. table 3

No	*Key Factors*	*N*	*Max*	*Mean*
27	Intrapreneurship	96	5	2.74
28	Top Managerial role	94	5	2.68
29	Policies and practice	96	5	2.61
30	Program information	96	5	2.56
31	Course length (2 years)	95	5	2.52
32	Technological Opportunity	96	5	2.44
33	Mngt Organizational structure	96	5	2.35
34	Mgmt Financial resources	94	5	2.25
35	Mngt Cultural change	95	5	2.20
36	Mngt High Turnover	94	5	1.53

The above finding is transformed into semi-structured interview form for in-depth interview to strengthen the validity of findings, and enhance the credibility of conclusions. From in-depth interview, the result explain several important points that cannot be answered through the qualitative study i.e why the *master degree offered* become the main important factor that motivate the participant to remain in the TEDIP; why *incubation process* and *intrapreneurship* which have been identified as key important factors for TED as discussed by D'Cruz, Shaikh, and Shaw, (2006); organization (Antoncic and Hisrich, 2003) and O'Shea et al., (2007) appear as not that important in this study; and why *high turnover* of *management* have been rated below than 2.00. Through pattern matching analysis, the researchers found that majority of the program participants (65%) feel that implementation of the current TEDIP is more concerning on academic rather than practice. Therefore, since they are in the program, the main motivation for them to remain in the TEDIP is to complete the study and get the *master degree*. However, the result also shows that majority of the program participants still have very strong anticipation to build their business network (88%), and to get the government support in term of policy and grant opportunity by remaining in the program (85%). Feedback from the study also shows that entrepreneurial spirit and self-efficacy are listed among the major motivating factors for the participants to remain in the TEDIP. Besides, managerial commitment and managerial skill of those who directly in charge the TEDIP also have been found among the main factors that motivate the participants to remain in the program. However, the feedback from the program participants indicate that the managerial commitment is more likely get lack of support from the main organization/institution as a whole. On the *incubation process and intrapreneurship*, the result from quantitative study seems to mention that these factors are not important for TED and were rated at only X=2.86 and X=2.74. However, result from in-depth interview highlighted that majority of respondents agree (88%) that both factors are important for TED, yet the implementation of both factors in the current TEDIP is not up to participants expectation. Final finding on *high turnover of management* in TEDIP in IHL and government organization, that has been rated below than 2.0 is also explained. The feedback from in-depth interview highlighted this element has cause uncertain of program implementation; and lack of knowledge continuity in terms program management, role and policy. The finding on key motivating factors that motivates the participants to remain in the TEDIP is shown in Figure 3.

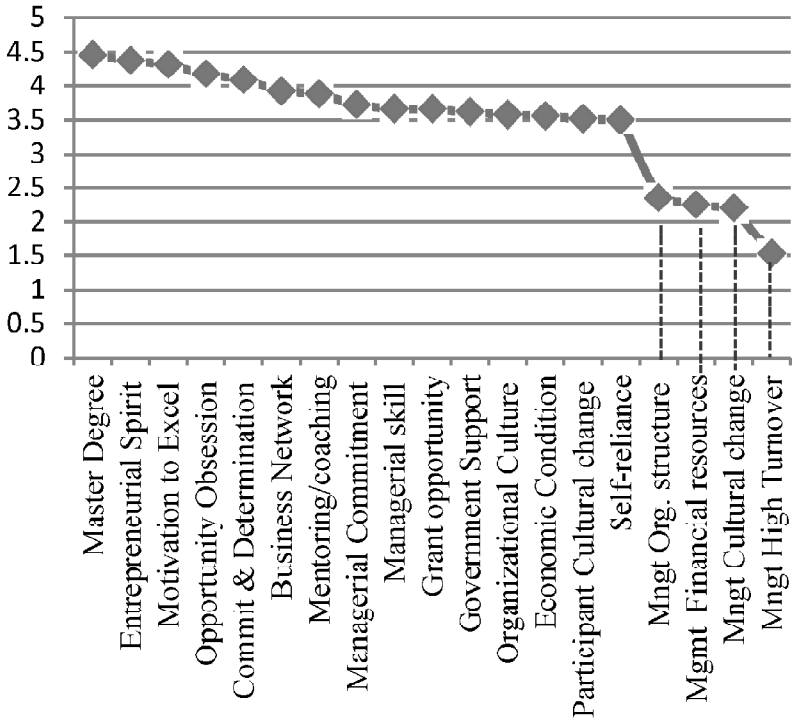

Figure 3: Key factors to motivate the participants to remain in TEDIP

V. CONCLUSION

The paper aimed to identify key factors that influence and motivate the current participants of TEDIP, i.e. young graduates and industrial players to participate and to remain in the program. Finding on key influencing factors for the participant to participate in the TEDIP revealed only 18 elements were found as main key influencing factors which was classified into two (2) categories i.e. primary category (8 elements) and secondary category (10 elements). The result shows that looking for business opportunity, strong entrepreneurial spirit, looking for market opportunity, strong self-efficacy, incubation process concept, looking for financial support, and master degree offered in technopreneur are the primary factors that have attracted the participants to participate in TEDIP. On, the other hand, there is no key element from *program implementation* found as one of the key influencing factors in this study. From this finding, the researchers could conclude as follows:

1) TEDIP participants do not caution on how the institution implement the program at the first place i.e. policies and practice, organizational climate, managerial role, financial resources, managerial commitment, managerial skill, high turnover management staff, and cultural change which is on the readiness of TEDIP management to change from traditional entrepreneurship program management to technopreneur management; and

2) The major key influencing factors for the participants to participate in TEDIP based on their (i) desire i.e. business network opportunity, market access opportunity, financial support opportunity; (ii) entrepreneurial spirit; (iii) self-efficacy i.e. commitment and determination; leadership; opportunity obsession; tolerance of risk, ambiguity and uncertainty; creativity; self-reliance; ability

to adapt; and motivation to excel;(iv) training environment i.e. incubation process; (v) type of degree offered i.e. Technopreneur Master Degree; and (vi) support i.e. family, contact and/or network support.

Result on key motivating factors for the participants to remain and to complete their study in the TEDIP shows a bit difference rank of key elements as mentioned in key influencing factors that encourage them to participate in the program. The finding shows that drive to complete the master degree becomes the main motivating factor to remain in the TEDIP, and looking for business opportunity becomes the 6th place of key motivating factor to remain in the program. Entrepreneurial spirit remains in the second ranking for both key influencing factors to participate and key motivating factors to remain in the TEDIP, whilst self-efficacy elements are listed as among important key motivating factors. In contrast with the finding in key influencing factors to participate in the TEDIP, the outcome also revealed managerial commitment and managerial skills are among key important factors to motivate them to remain in the TEDIP. These results direct the researchers to elaborate the finding with six (6) key conclusions:

1) There were 15 elements found as key motivating factors to motivate the TEDIP participant to remain in the program i.e. master degree, entrepreneurial spirit, motivation to excel, opportunity obsession, commitment & determination, business network opportunity, mentoring/ coaching activity; managerial commitment; managerial skill; grant opportunity, government support, organizational culture, economic condition, participant cultural change, and self-reliance;

2) Certain key elements were positioned at different level of key influencing factors that encourage the participations to participate in TEDIP and key motivating factors to motivate the participants to remain in the TEDIP;

3) Entrepreneurial spirit and self-efficacy are among two (2) main key elements that always come together in TED;

4) The organization / institution need to stretch more attention on Implementation process i.e. managerial commitment, managerial skills; and institutional environment i.e. organizational culture as these elements are found among the key factors that could motivate the TEDIP participants to remain in the program;

5) Incubation process and intrapreneurship were found as important for TED through TEDIP, yet the implementation of both factors in the current TEDIP is not up to participants' expectation; and

6) High turnover of management has demotivated the participants to remain in the program and gave negative implication to TEDIP i.e. uncertain of program implementation; and lack of knowledge continuity in terms program management, role and policy.

Through the above findings it has been proven that both research objectives are achieved. On the basis of finding, the model developed will hopefully help the TED organization to increase the number of participants in TEDIP. The policy makers and the TED agencies may utilize this result to develop further TED program in the country.

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