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EXPLICATING THE ROLE OF TECHNOLOGICAL ADAPTATION IN THE DEVELOPMENT OF UNIVERSITY-BASED ENTREPRENEURIAL ECOSYSTEM: EVIDENCE FROM MALAYSIA

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ABSTRACT
This study explored the significant role of technological adaptation in explicating the mesh mechanism surrounding the development of substantive University-based entrepreneurial ecosystem in context. The researchers employed a Constructivist grounded theory approach to explicate the essence of Technological adaptation in the development of University-based entrepreneurial ecosystem (U-BEE) in Malaysian universities. Methodologically, interview and observational data were garnered in 3 stages, identifying 26 initial categories and 11 macro-themes. The researchers explicated in detail respondents' perceptions of Technological adaptation in relation to the complexities surrounding UBEE development. The emergence of this dimension explicates the intricate complexities in the development of UBEE in Malaysian context. The research implications in relation to future theoretical development are dutifully discussed.

There is a recurring demand for a research that contributes to the general body of knowledge on global entrepreneurial dimensions through the modelling of a substantive paradigm that would feature and foster an intelligent university-based entrepreneurial ecosystem (Beaudry, Green & Sand, 2018; Chowdhury, Desai & Audretsch, 2018), capable of unraveling the entrepreneurial dilemma pervading the atmosphere of the research location (Priem, Wenzel & Koch, 2018). Therefore, studies that indigenously elucidates substantive entrepreneurial dimensions significantly aid the development of university-based entrepreneurial ecosystem in emerging economies (Littlewood & Holt, 2018; Peters & Kallmuenzer, 2018). Hence,

this research empirically adds to the theoretical development of Malaysian university-based entrepreneurial ecosystem in terms of ascertaining viable entrepreneurial dimension.

There are indigenous issues that demand indigenous evidence and research in relation to the role of technological adaptation in the development of university-based entrepreneurial ecosystem. Therefore, this study demonstrates that fishing from entrepreneurially-inclined nations is not sustantively answerable to the indigenous issues in Malaysian universities and only substantive solutions could amend susbstantive issues. Nomological networks among actors are difficult to manage due to varying cultural (Bhachu, 2017; Thrift & Amin, 2017), economic (Parker, 2018) and psychological backdrop (Turban et. al., 2018), therefore, the study's substantive structure is verifiably significant.

This study didactically explicates the complexities surrounding technological adaptation and the significant relationship existing between technological adaptation and entrepreneurial tool. Technological innovation establishes infrastructural linkages that necessitates technological adaptation, among other entrepreneurial functionalities.

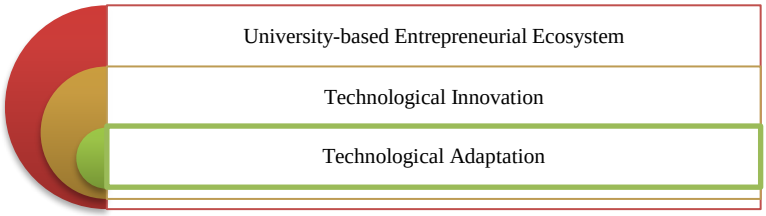

Figure 1. The Role of Technological Adaptation in the development of University-based Entrepreneurial Ecosystem .

The figure above indicates that technological innovation foreshadows technological adaptation. The growing concern for innovations in entrepreneurship demands a social-technical research that imbues technogical adaptation in relation to entrepreneurial essence. The dimension of technological adaptation has immense nomological merit and its nomological role occassions vast technocentric approach. Scholars have argued over the definition and causality of technological adaptation (Majchrzak et al., 2000; Ellul, 2018) and several perspectives examine this dimension in relation to entrepreneurial orientation and other entrepreneurial preferences. However, this study significantly underscores the relationship between technological adaptation and startup decisions and the critical role of technological adaptation in the development of university-based entrepreneurial ecosystem. This study confirms the findings of Majchrzak et al., (2000) about the correlational significance of technological adaptation or smart digitization in the development of university-based entrepreneurial ecosystem. Hence, technological adaptation aids the discovery of entrepreneurial processes in relation to the development of university-based entrepreneurial ecosystem.

Problem Statement

Entrepreneurial ecosystem is imbued with overt deductive perpectives and an inductive study can exclusively determine dimensional variations. This study explores entrepreneurial paradigms in relation to the development of a viable Malaysian entrepreneurship ecosystem in public and private universities. In general, a plethora of extant studies lacks inductive entrepreneurial depth but this current study aptly underscores the substantive essence of technological adaptation. Methodologically, this research was conducted in answer to the towering necessity of an inductive approach in relation to the intricacies surrounding the features and future of technological adaptation in the development of university-based entrepreneurial ecosystem in Malaysian universities.

The Aim of Research

Essentially, this study shows that past studies are imbued with superficial profiling in terms of technical adaptive requisites and only an inductive approach fosters clarity and uncovers latent dimensional paradigms. Therefore, this research essentially focuses on uncovering latent technical adaptive dimensions in relation to the development of university-based entrepreneurial ecosystem in Malaysian universities.

Method of Research

Substantive data was gathered purposively by interviewing 10 entrepreneurial leaders in ten (10) public and private universities in Malaysia. The researchers employ a semi-structured questionnaire that covers socio-technical background of the informants.

The range and caliber of respondents that provided information was in agreement with the tenets of Constructivist grounded theory. Constructivist grounded theory states that grounded data could be mined with profound inductive research experience (Charmaz, 2006; Mills, Bonner & Francis, 2006) and this plausibly occasioned the emergence of the dimension of technological adaptation. In Constructivist grounded theory study, the analytical process is cardinal to the emergence of substantive dimensions (Charmaz, 2006; Bryant, 2007).

Analysis and Discussion

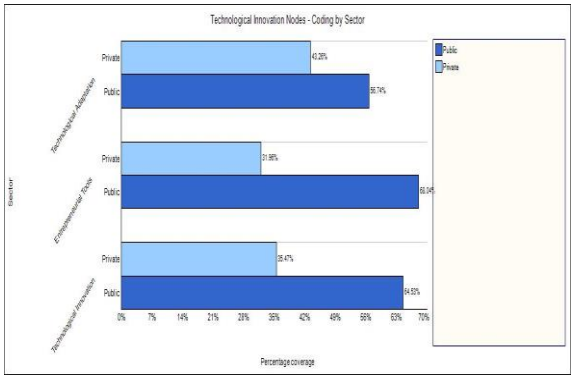

Figure 2. Technological Adaptation by Sector

This study, as seen in Figure 2 shows that Public universities in Malaysia have attained higher adaptation to technology than private university, and this percentage is around 56.74% compared to Private universities (43.26%).

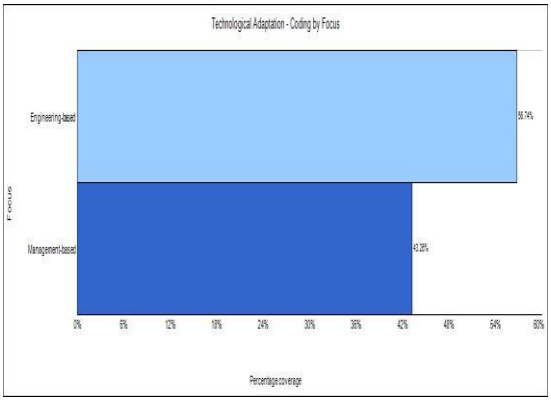

Figure 3. Technological Adaptation by Focus

This result also supports findings from other research which posited that the increasing position of technological adaptation is critical in the face of contemporary economic fluidity, and its increment results in entrepreneurial ecosystem development and higher number of university spin-offs (Fryges & Wright, 2014; Mosey et al., 2017). In contrast with the result of this research, technological adaptation has not been greatly perceived as a technology-push phenomenon unlike other context (Brem & Nylund, Chuster, 2016), whereby every would-be entrepreneur is impassioned and spirited about manufacturing and application of complex and new technology for the development of university-based entrepreneurial ecosystem (Giones et al., 2013).

The result justaposes the recurring debate about the position of entrepreneurial adaptation and entrepreneurial activity using digital technologies. Nambisan (2017) contends that technological adaptation capitally heightens entrepreneurial processes and the result of this research also shows technological adaptation as well as digitization has major impact on entrepreneurial processes in general. While the argument of Frederiksen, Giones and Brem (2017) conclude that only the approach of a lean startup could maximally benefit from technological adaptation, this research shows that the purview of university-based entrepreneurial ecosystem aptly profits from technological adaptation, as well as activates products' global niche.

Some have advocated that entrepreneur's personality has been the core factor (Dehlen et al., 2014) in entrepreneurial success and in the development of an entrepreneurial ecosystem, but the result of this research shows that technological adaptation is critical to the development of university-based entrepreneurial ecosystem, in terms of goal's implication and dimensional cognition. However, technological adaptation, according to this research is an extra asset which easily transforms users into a budding entrepreneurial ecosystem, provided other factors are rightly positioned.

The dimension of technological adaptation may have empirical challenges in terms of the development of the entrepreneurial ecosystem and is only

amenable in a complementary role. The complementary role played by technological adaptation gives rise to effective technological knowledge, vastly known as technological push. From the perspective of this research, the varying classifications of technological adaptation actively aids entrepreneurial orientation and financial preferences, contrary to the arguments of entrepreneurial identity. However, this research as seen in the matrices in Table 1 clearly demonstrates that technological adaptation increasingly enhances startup decision and is critical to the development of university-based entrepreneurial ecosystem. In support of this research, the findings of Kyprianou and Nikiforou (2016) state that technology adaptation or effective digitization aid interconnected system modelling and the aim of a university-based entrepreneurial ecosystem could easily be realized. Therefore, an entrepreneur could discover and make use of entrepreneurial opportunities for the development of profit-oriented entrepreneurship ecosystem.

Technological Adaptation
323 : Entrepreneurship of Innovation
324 : Entrepreneurial students have greater inputs
325 : Entrepreneurial deficient students
328 : Coordination requires a great level of skills and effort
329 : Converting ideas into working solutions and practical businesses
330 : Big business is extremely vital for economic health
332 : Balanced entrepreneurial cultures
334 : Aspiring entrepreneurs are not educated enough
335 : An innovative space
155 : Good entrepreneurial mechanisms
156 : Exploration of new concepts and instrumentation development
157 : Entrepreneurial intensive training
158: Empirical tools help ensure sustainability

Table 1. Matrices of Technological Adaptation

In line with the result of this research, as seen in Figure 3, Engineering-based university has higher technological adaptation than Management-based university, and this percentage is around 56.74% compared to Management universities (43.26%). Some of the respondents' experiences clearly demonstrate this verity:

Inculcating entrepreneurial and technical skills...(Informant 2)
Identification of students' ability in technology usage...(Informant 6)
Technology helps to promote their products ...(Informant 8)
The entrepreneurship of Innovation entails technology...(Informant 7)
Entrepreneurial students have a greater flair for technology...(Informant 10)
Coordination requires a greater level of technical skills and effort...(Informant 5).
Converting ideas into working solutions and practical businesses...(Informant 9).

Aspiring entrepreneurs are not educated enough in high tech devices...(Informant 1).
Exploration of new concepts through technology...(Informant 3).

Two Propositions: Two propositions clearly emerged from the informants' transcripted coded interview:
(i) "Entrepreneurial adaptation ensure sustainability". This indicates that entrepreneurial adaptation is positively related to entrepreneurial behavior.
(ii) "Entrepreneurial adaptation aids the process of value creation". This indicates that entrepreneurial adaptation influences entrepreneurial ecosystem development.

Two Contextual Issues:
(i) Necessity of entrepreneurial adaptation in relation to the development of entrepreneurial ecosystem.
(ii) Necessity of aiding the process of value creation through technological adaptation.

Emmanuel (2017) carefully analyzed a vast data of more than four hundred leaders of entrepreneurship in Nigeria and reported that technology adoption is vital in the development of entrepreneurship, but the rate of technological adaptation is abysmally low in comparison with the context of this research. Walrave and Raven (2016) introduced system modelling and also agrees with the result of this research that there is an apparent transition in the field of entrepreneurial management and subtle amalgamation of innovation systems aids the development of entrepreneurship ecosystem (Samuel, Salleh & Suhairi, 2018). This research answers some timely questions which include:

- How does technological adaptation impact entrepreneurship in emerging entrepreneurial ecosystems?
- How does low technological adaptation lower the effectiveness of the entrepreneurial ecosystem in emerging economies?
- How does technological innovation influences an entrepreneurial ecosystem and to what extent?

Conclusion

This research builds a substantive evidence for technological adaptation in relation to the indigenous significance of technological innovations in developing university-based entrepreneurial ecosystem in the research context. Therefore, further research on technological adaptation would further increase the bonding role of entrepreneurial ecosystem and technological innovation and the processes of their co-evolution could be substantially explicated and modelled for the substantive development of intelligent university-based entrepreneurial ecosystem in the context of the research. Hence, this study develops an entrepreneurial dimension (technology adaptation) and provides a theoretical scaffold for its empirical validation. In support of the research verities, empirical validation assists in

deciphering the impact of technological adaptation in constraining and enabling entrepreneurial activities and the process of entrepreneurial ecosystem development in Malaysia.

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References

Beaudry, P., Green, D. A., & Sand, B. M. (2018). In search of labor demand. *American Economic Review*, *108*(9), 2714-57.

Bhachu, P. (2017). *Immigration and entrepreneurship: culture, capital, and ethnic networks*. Routledge.

Bryant, A. (2007). A Constructive/ist Response to Glaser's" Constructivist Grounded Theory?". *Historical Social Research/Historische Sozialforschung. Supplement*, 106-113.

Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative analysis*. Sage.

Chowdhury, F., Desai, S., & Audretsch, D. B. (2018). Introduction and overview. In *Corruption, Entrepreneurship, and Social Welfare* (pp. 1-8). Springer, Cham.

Ellul, J. (2018). *The technological system*. Wipf and Stock Publishers.

Emmanuel, Y. (2017). Influence of entrepreneurship education, technology and globalisation on performance of SMEs in Nigeria. *African Journal of Business Management*, *11*(15), 367-374.

Fryges, H., & Wright, M. 2014. The Origin of Spin-offs: A Typology of Corporate and Academic Spin-offs. *Small Business Economics*, 43(2): 245–259.

Kyprianou, M., & Nikiforou, E. (2016). Teacher professional learning: developing with the aid of technology. CALL communities and culture–short papers from EUROCALL 2016 Edited by Salomi Papadima-Sophocleous, Linda Bradley, and Sylvie Thouësny, 248.

Littlewood, D., & Holt, D. (2018). Social entrepreneurship in South Africa: Exploring the influence of environment. *Business & Society*, *57*(3), 525-561.

Majchrzak, A., Rice, R. E., Malhotra, A., King, N., & Ba, S. (2000). Technology adaptation: The case of a computer-supported inter-organizational virtual team. *MIS quarterly*, 569-600.

Mills, J., Bonner, A., & Francis, K. (2006). Adopting a constructivist approach to grounded theory: Implications for research design. *International journal of nursing practice*, *12*(1), 8-13.

Mosey, S., Guerrero, M., & Greenman, A. 2017. Technology Entrepreneurship Research Opportunities: Insights from Across Europe. *The Journal of Technology Transfer*, 42(1): 1–9.

Nambisan, S. (2017). Digital entrepreneurship: Toward a digital technology perspective of entrepreneurship. *Entrepreneurship Theory and Practice*, *41*(6), 1029-1055.

Parker, S. C. (2018). *The economics of entrepreneurship*. Cambridge University Press.

Peters, M., & Kallmuenzer, A. (2018). Entrepreneurial orientation in family firms: The case of the hospitality industry. *Current Issues in Tourism*, *21*(1), 21-40.

Priem, R. L., Wenzel, M., & Koch, J. (2018). Demand-side strategy and business models: Putting value creation for consumers center stage. *Long range planning*, *51*(1), 22-31.

Thrift, N., & Amin, A. (2017). Neo-Marshallian nodes in global networks. In *Economy* (pp. 159-175). Routledge.

Walrave, B., & Raven, R. (2016). Modelling the dynamics of technological innovation systems. *Research Policy*, *45*(9), 1833-1844.

Frederiksen, D. L., & Brem, A. (2017). How do entrepreneurs think they create value? A scientific reflection of Eric Ries' Lean Startup approach. *International Entrepreneurship and Management Journal*, *13*(1), 169-189.

Giones, F., Zhou, Z., Miralles, F., & Katzy, B. (2013). From ideas to opportunities: Exploring the construction of technology-based entrepreneurial opportunities.

Turban, E., Outland, J., King, D., Lee, J. K., Liang, T. P., & Turban, D. C. (2017). *Electronic commerce 2018: a managerial and social networks perspective*. Springer.

Samuel. O, Mohd Salleh D., Hanif A. (2018). Empathic Critic of 'Smart' Entrepreneurship Evolution. *American Journal of Operations Management and Information Systems*, Volume 3, Issue 2, June 2018, Pages: 38-45.