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Knowledge Transfer in University-Private Research Partnership in Saudi Arabia: A review

Research-in-progress

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Abstract

The Kingdom of Saudi Arabia seeks to have at least five universities in the top 200 of international rankings by 2030; which urges academics to develop strong research partnerships with the private sector. Furthermore, the intermediary company has emerged in several universities to facilitate knowledge transfer processes between universities and the private sector mutually. Nevertheless, despite the growing awareness of the importance of research partnership, studies stressed that current partnerships' level is relatively low. Thus, there is a need to investigate this issue further. Besides, there is a need to in-depth analyse the gender-difference to understand the phenomenon. Accordingly, this mixed-methods study aims to examine the influence of social capital theory factors on the knowledge transfer process, with the existence of the intermediary company between public universities and private sector during the Engagement phase in Saudi Arabia based on the perspectives of the leaders' gender.

Keywords Knowledge Transfer (KT), University-Private-Partnership (UPP), Intermediary Company (IC), Gender-Difference (GD), Saudi Arabia.

1 Introduction

Knowledge Transfer (KT) refers to the knowledge that is transferred inter-organisationally from organisation to another organisation, including “business partners, suppliers, customers, etc.” (Duan et al. 2011, p. 1524). University-Private Partnership (UPP) is a cross-sector relationship where ‘university’ refers to the academic sector, and ‘private sector’ refers to industry or firms. Historically, UPP has received much attention on literature after the 1970s’ crisis which caused the academic transformation in which both academia and private sector forced to partner to overcome the crisis (Cooper 2011). As well, contributions in the literature of KT-UPP as part of Information Systems (IS) studies have been published after 2006 (de Wit-de Vries et al. 2019; Perkmann et al. 2013). Reviewing subsequent and recent literature, KT-UPP applied through a variation of the formal and informal channels, such as joint research, publications, conferences and meetings, consulting, university patents licensing, mobility, etc. have been examined widely (Arza 2010; Perkmann and Walsh 2007; Schaeffer et al. 2020). According to Nsanzumuhire and Groot (2020), most of the studies on KT-UPP from developed and developing countries have categorised and prioritised KT channels by their importance, or by how much actors at university and private sector preferred. This present study will investigate only on the research partnership that includes, R&D projects, contract research, and contract consulting (de Wit-de Vries et al. 2019; Perkmann and Walsh 2007). As UPP is evolving through different lifecycle phases to manage projects, this study will target the ‘Engagement stage’ which refers to the actual project stage, where university and private sector have already done with all agreements and started to be working together, in this stage, success is measured by completing the project-specific deliverables (Plewa et al. 2013).

This study will explore the role of the intermediaries that have been addressed as one of the effective mechanisms to overcome KT-UPP channels barriers (Ankrah et al. 2013; Battistella et al. 2016). The intermediary organisation could act as a third party to facilitate KT or could participate and contribute into KT process “with the aim of supporting the development of the process in its criticalities, addressing enabling or constraining factors” (Battistella et al. 2016, p. 1206). Various types of intermediaries widely range from an individual to organisations (Battistella et al. 2016). However, this study will focus on the Intermediary Company (IC) and its subsidiaries that are wholly owned by universities; in which they handle contract research and commercialise processes “associated with bringing scientific discoveries to market” (Wright and Shore 2017, p. 56).

Furthermore, Gender-Difference (GD) will be examined in this study in the context of KT-UPP. A recent review of the literature on GD-UPP found pieces of evidence of gender’s impact in the UPP. An example of this is the study carried out by Calvo et al. (2019) in which GD was associated with leaders’ motivations and attitudes towards UPP in R&D projects. As well, due to the lack of theories to justify GD-UPP, Tartari (2015) found that the presence of women may help to overcome the GD regarding UPP. According to Calvo et al. (2019), though male leaders are better than female leaders in terms of commercialisation and social collaboration. However, given the same motivations, both genders leaders will perform equally; further, with an appropriate environment, women would even collaborate better than men (Bozeman and Gaughan 2011). Hence, GD requires further investigations to understand the effect of GD with respect to research partnership towards UPP (Calvo et al. 2019; Siemiatycki 2019; Tartari 2015; Zhang and Wang 2017).

1.1 The Purpose Statement

The purpose of this mixed-methods study is to examine factors that influence KT process through the lens of the Social Capital Theory (SCT) in a research partnership between public University and Private Sector (UPP) during the Engagement stage in Saudi Arabian context; moderated by IC and controlled by GD factors through targeting leaders at public university, IC, and private sector. A conceptual framework is provided to summarise the core concept of this study, see Figure 1.

An explanatory sequential mixed methods design will be applied. This two-phase design will involve collecting quantitative data first and then explaining the quantitative results with in-depth qualitative data (QUAN → qual) (Creswell and Creswell 2018; Ivankova et al. 2006). In the first phase (QUAN), an online survey will be designed to obtain statistical data. The quantitative results will be collected from (male/ female) leaders at selected public universities with their ICs, and several private sector companies, that have been already in a research partnership with universities, in Saudi Arabia. The intent will be to test quantitative hypotheses that will explain how SCT dimensions’ relate to the KT process. In the second phase (qual), face-to-face semi-structured interviews will be conducted with selected individuals who completed the online survey, as a follow up to help explain the quantitative

results. In this follow-up phase, the tentative plan is to provide a more in-depth insight into leaders' motivations towards KT-UPP based on their gender at selected public universities with their ICs, and a number of private sector companies, that have been already in a research partnership with universities, in Saudi Arabia.

The following are the overarching research questions that will be answered in each phase of this study:

- What factors would influence KT-UPP through the lens of SCT in Saudi Arabia; from the leaders' perspective at the university, private-sector, and IC? (phase one)
- How can the statistical results obtained in the first phase, be interpreted in this follow-up phase? (phase two)

Taking into consideration that this is a research-in-progress, the above overarching research questions will be broken down later into several sub research questions in each phase of this study. Nonetheless, the specific research sub-questions for (phase two) in particular will be formulated later based on the results of the (phase one) of the study.

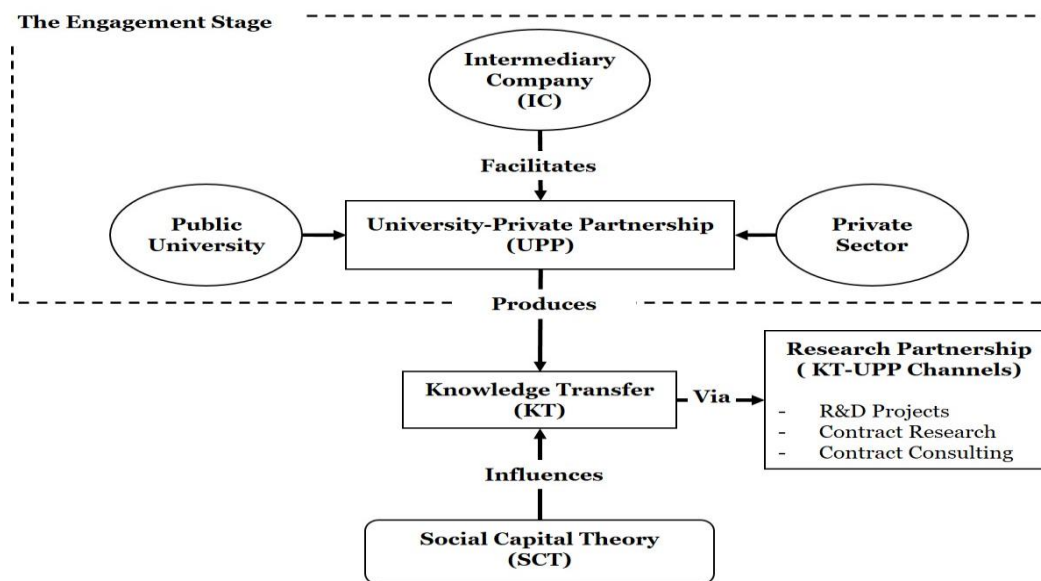


Figure 1: A Conceptual Framework of KT-UPP in the Saudi Arabian Context

1.2 Study Aims

The present study is expected to accomplish the following aims:

- To address the status quo of KT-UPP in Saudi Arabia;
- To identify the SCT factors that influence KT process; moderated by IC and controlled by GD factors (phase 1); and
- To explore the impact of GD in the leaders' motivations towards KT-UPP in Saudi Arabia from the leaders' perspective at the university, private-sector, and IC (phase 2).

1.3 Theoretical Perspective

Social Capital Theory (SCT) will be applied in this study to examine factors that influence KT-UPP in Saudi Arabia. SCT broadly aims to the networks of relationships that lead to social interactions and embedded resources in those social interactions extending from individuals to groups such as organisations. As well, SCT definition by Nahapiet and Ghoshal (1998) has been adopted in many studies; in addition to the suggested three dimensions framework that has been broadly applied from different perspectives; which helped to measure the influence of SCT. According to Nahapiet and Ghoshal (1998, p. 243), SCT is defined as “the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit”. It includes three dimensions with a number of factors in each one, structure, relational,

and cognitive dimensions; see Figure. 2 that was adopted and then edited from (Nahapiet and Ghoshal 1998, p. 251).

Structural dimension of SCT comprises a pattern of interconnection and relationship networks of inter-organisational entities, including three sub-dimensions factors, network ties, network configurations, and appropriable organisation. Relational dimension is the most influential component of SCT as it concentrates on social interactions from the perspective of characteristics and quality of those relationships; thus it is the most important dimension to facilitate inter-organisational KT (Van Wijk et al. 2008). It involves four facets, trust, norms, obligations, and identification. Cognitive dimension refers to “resources providing shared representations, interpretations, and systems of meaning among parties” (Nahapiet and Ghoshal 1998, p. 244). It clusters two sub-dimension factors, shared codes and language, and shared narratives. Comparing to structural and relational dimensions on SCT literature, the studies on cognitive dimension are inconsistent and haven’t been investigated as much as other dimensions; and that it might attribute to difficulties in measuring its facets (de Wit-de Vries et al. 2019; Nahapiet and Ghoshal 1998; Zhang and Wang 2017). Thus, SCT will contribute to bridge the current gaps and promote our understandings of what factors would influence KT-UPP.

Structural Dimension	Cognitive Dimension	Relational Dimensions
<ul style="list-style-type: none"> ▪ Network Ties ▪ Network Configurations ▪ Appropriable Organisation 	<ul style="list-style-type: none"> ▪ Shared Codes and Language ▪ Shared Narratives 	<ul style="list-style-type: none"> ▪ Trust ▪ Norms ▪ Obligations ▪ Identification

Figure 2: SCT Dimensions and Sub-Factors

1.4 Significance of the Study and Expected Contribution

The roles of IC and its subsidiaries, as wholly-owned entities by universities, in facilitating KT-UPP have been emerged in Saudi Arabia. Nonetheless, there have been no studies that address IC in the context of KT-UPP in Saudi Arabia. Therefore, the foremost significance of this present study will be the novelty of being the first study that will contribute to addressing IC as a facilitator in the KT-UPP process in Saudi Arabia. As well, the role of the private sector’s actors in the research partnership hasn’t got much attention on the literature comparing to the academic partner (de Wit-de Vries et al. 2019). Thus, this study may contribute to moving the field of KT-UPP forward by exploring the perception of both academic and private sector partners. Although this study will be running in Saudi Arabia; the outcomes may be significant to the body of knowledge in the developing countries, especially in the Arab world countries who almost share the same educational settings and KT-UPP barriers (Alrajhi and Aydin 2019; Chryssou 2020; Lopes and Lussuamo 2020; Nsanzumuhire and Groot 2020). In view of that, previous significances would also justify restricting this study to the Saudi Arabian context.

In the theoretical aspect, there is still a lack understanding of how cognitive differences would be managed between intermediaries and their clients in UPP (de Wit-de Vries et al. 2019; Villani et al. 2017). Thus, this study by examining the role of IC through SCT may contribute to explain further these differences through KT-UPP in Saudi Arabia. Furthermore, as GD is a controversial matter; yet no much studies have theoretically addressed GD-UPP and leaders’ attitudes towards UPP (Calvo et al. 2019; Siemiatycki 2019; Tartari 2015). Hence, this study may benefit to in-depth investigation the role of the leaders based on their gender.

In the methodological aspect, this study will investigate practically in techniques of the sequential explanatory design by interpreting the quantitative and qualitative data sequentially and then integrating both phases’ results describe the phenomenon from different perspectives (Creswell 2018). Precisely, combining results may be significant and yield to enrich KT-UPP field; as the majority of the literature identified KT factors either quantitatively or qualitatively (de Wit-de Vries et al. 2019).

2 Literature Review

In 2016, the Saudi Government announced a Vision 2030, which is a long-term strategic project that fundamentally aims to transfer the whole economy from being an oil-based economy to a knowledge-based economy. According to Saudi Vision 2030 (2016), the Kingdom of Saudi Arabia aims ambitiously to have at least five universities in the top 200 of international rankings by 2030. One

approach among others to achieve this is by conducting strong partnerships to transfer knowledge with all sectors bi-directionally. Developing UPP by establishing long-term investment on the research of existing matters towards industrialising research results as value-added products and innovation, will contribute to the economic growth and diverse universities sources of income. By evolving the research ecosystem, scientific productivity will increase, national manufacturing will grow, and local services will improve; which will empower the kingdom competition's level nationally and internationally. The next sections will briefly discuss the current status of KT-UPP, the recent development of IC, and the potential role of GD in the research partnership in Saudi Arabia.

2.1 Knowledge Transfer in the University-Private Partnership (KT-UPP)

In the last two decades, there has been growing interest in the importance of UPP in Saudi Arabia. In addition to the current successful, established UPP in Saudi universities, many initiatives have been adopted to support R&D towards fulfilling the objectives of the Saudi Vision 2030 (KACST 2020; Ministry of Education R&D 2019). Even though there are pieces of evidence of successful Saudi KT-UPP, studies have demonstrated that UPP level remains low and the status quo has not reached yet the extent to which the Saudi Kingdom aspires.

By reviewing related literature, there has been an agreement in the importance of UPP in Saudi Arabia. However, barriers to KT-UPP in Saudi Arabia have been verified, which somehow justified the low level of the UPP. Organisational differences were the most reported barrier, in which both actors of UPP agreed on. Furthermore, unwillingness to partner with, reciprocally; which explains the criticism that raised against academics of being ambiguous in the partnership terms and procedures. Thus, working on changing the mindset towards R&D is essential to reach convergence on perspectives.

Consequently, from academics' views, the cultural obstacle was one of the barriers; of which private sector is not aware of university proficiencies, does not value R&D, tends to be self-sufficient, or underestimates national researchers by collaborating internationally. Managerial obstacle and financial issue were also stated. Likewise, rewards deficiency to encourage partnership in universities was one of the barriers. On the other hand, barriers to KT-UPP were also discussed from the private sector perspectives, such as commercialisation obstacles as a result of the academics' inattentiveness towards commercialising their capabilities. Moreover, the administrative barrier also was mentioned regarding the complicated bureaucracy in the university system; which discourages private sector to partner with academics researchers. As well, production obstacles are regarding academic research outcomes that do not meet the private sector' needs and lack of specialised laboratories in universities to materialise scientific research outcomes into initial products (Alhammedi et al. 2016; Alrajhi and Aydin 2019; Alshehri et al. 2016; Khorsheed and Al-Fawzan 2014).

In this study, KT will be practically defined as the process in which Saudi public universities that already own an IC, and private sector companies will be both affected reciprocally by the experience of each other via accessing each other knowledge through the research partnership channels. Whereas Saudi UPP will be defined practically as the formal short-term or long-term arrangements between Saudi public universities, of which already own IC, and the domestic private sector to inter-organisationally transfer knowledge through research partnerships' channels such as joint R&D projects, contract research, and contract consulting; for mutual benefit. As well, this study will adopt definitions of KT-UPP channels from D'este and Patel (2007, p. 1310), as they are enough to meet the purpose of this study. Thus, joint R&D project is defined as "collaboration agreements between university and industry that involve research work undertaken by both parties". Contract research is defined as "research commissioned by industry and undertaken only by university researchers"; while contract consulting is defined as "work commissioned by industry, which does not involve original research (e.g. conducting routine tests or providing advice to industry)".

2.2 Intermediary Company (IC)

Along the same lines, towards achieving a knowledge-based economy in Saudi Arabia, the Ministry of Education has established in the main cities a number of companies that are wholly owned by universities. Deputy Ministry of Research and Innovation (2014) stated that launching intermediary companies is primarily to bridge KT-UPP gaps. As well, research partnerships and research services among other KT channels are the top priority expected outcomes from those intermediaries. Hence, IC as a private sector organisation in this study is practically defined as a Saudi legal independent entity that invests on behalf of the Saudi public university, besides acting as an intermediary to facilitate the KT-UPP processes. Up to the date of writing this, there are six companies with their subsidiaries that are fully owned by six leading Saudi public universities. Theoretically, IC as a moderator factor in several studies facilitates KT-UPP, especially in the presence of SCT. As well, it promotes the two-way

beneficial consequences and decreases the potential issues Ankras et al. (2013). Theoretically, further studies need to be conducted in order to understand how IC relate to other entities to manage cognitive differences in the context of UPP (de Wit-de Vries et al. 2019; Villani et al. 2017). Additionally, to successfully build a strong long-term KT-UPP, the role of the IC must be precise since the early stages of the partnership (Plewa et al. 2013). In this study, the moderating role of IC-UPP will be examined.

2.3 Gender-Difference (GD)

GD broadly is a controversial topic at every level among disciplines. However, considering the aim of this study, there is a lack of previous research studies on GD-UPP in Saudi Arabia that requires further examinations. Theoretically, in general, there is a lack of theoretical framework in GD-UPP studies (Siemiatycki 2019; Tartari 2015), as GD gap differentiates throughout KT-UPP process. Additionally, there is also limited studies that discuss attitudes towards UPP, particularly in the leaders of research groups (Calvo et al. 2019). Thus, several studies examined GD-UPP from different perspectives aiming to develop a theoretical framework (Berger et al. 2015; Calvo et al. 2019; Tartari 2015; Zhang and Wang 2017). In this study, GD will be conceptualised as a control variable representing leaders' gender (male-female) at university, IC, and the private sector during phase one study. Then, the statistical results will be analysed further in phase two in order to identify leaders' motivations based on GD towards KT-UPP in Saudi Arabia.

3 Research Design

This study is an explanatory sequential mixed methods design. It will involve two phases, quantitative phase and then qualitative phase sequentially; as explained in details in the purpose statement section. Hence, the following initial visual model will summarise the research methodology design of this study, see Figure. 3; in which this model's structure was adopted from (Creswell and Creswell 2018).

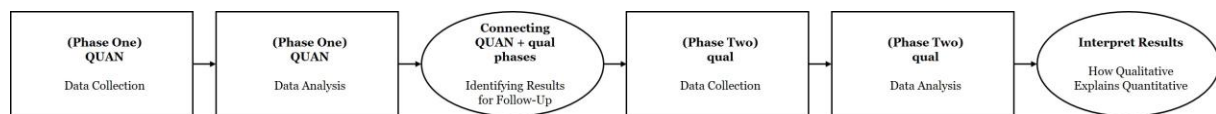


Figure 3: A Visual Model of Research Design, (Explanatory Sequential Mixed methods Design)

4 Conclusion

This study aims to examine factors that influence KT-UPP process in Saudi Arabia through R&D projects, contract research, and contract consulting; moderated by IC and controlled by GD factors. The Engagement stage on the partnership's lifecycle will be applied, as this represents the actual stage of the project. As well, the target group will be leaders at the public university, the private sector, and IC. UPP in Saudi Arabia remains low as a result of several barriers, comprising organisational and cultural as the most reported barriers. This study will contribute to in-depth illustrate and analyse the KT-UPP in Saudi Arabia. One of the significances of this study will be the exploration of the role of IC in facilitating KT-UPP. Besides, controlling the statistical results based on the GD, which then will be extended to explore leaders' motivation towards KT-UPP in Saudi Arabia based on their gender. Additionally, leaders' perspectives will be examined from academics and the private sector; which will contribute to filling the gap of underestimation the private sector's roles in favour of the academics. Given that, in the context of the research partnerships in KT-UPP, there is limited attention to the perception of the private sector's actors comparing to the academics' perception.

Regarding methodological method, an explanatory sequential mixed methods design will be conducted, as this two-phase design will expansively achieve the study aims and further objectives. Furthermore, there is a need to close gaps between quantitative and qualitative studies in the context of KT-UPP to improve our understanding of this phenomenon. Theoretically, further studies need to be conducted, aiming to understand to what extent IC manages cognitive and cultural differences and facilitate KT-UPP. Besides, more studies will be required to identify the theoretical framework of GD-UPP and to discuss leaders' attitudes towards UPP. Therefore, the theoretical framework and its related hypotheses are being developed as this study is still in progress.

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