Perceived benefits of a knowledge transfer office

A multiple case study on SSHA researchers from Radboud University

Radboud University

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Abstract

Previous studies on knowledge transfer (KT) in Social Sciences, Humanities and Arts (SSHA) are lacking and little attention is paid to the researchers' perception of the KT process. The purpose of this research was to find out what determines the perceived benefits of a knowledge transfer office (KTO) for SSHA-researchers that engage in KT. A qualitative multiple case study was conducted in which ten SSHA researchers from the Radboud University were interviewed about their engagement in KT activities. From these researchers, eight had consulted a KTO. The results show that researchers are motivated to engage in KT activities for several reasons, of which contributing to society, research and career related reasons were found most frequently. Motivations were often similar and sometimes different from the perceived benefits of KT. It appears that the type, moment, and degree of a KTO's involvement, the perceived KTO quality, the KT activity and the valuation of KT by the university can determine the researchers' perception of benefits of a KTO when engaging in KT. From the findings, useful indicators for motivations to engage in KT, benefits of KT, type and degree of KTO involvement and KTO quality are derived.

Keywords: knowledge transfer; knowledge transfer office; social sciences, humanities and arts; motivations; benefits knowledge transfer; type and degree of KTO involvement; KTO quality

Content

1. Introduction

1.1 Problem statement

Over the last decades, attention for the third mission of universities has been increasing (Compagnucci & Spigarelli, 2020). This so-called third mission entails that universities try to bridge the knowledge gap between them and actors outside the academic environment. Knowledge should be distributed between all actors in the quadruple or quintuple helix model, so university, government, industry, society, and environment (Baccarne, Logghe, Schuurman, & De Marez, 2016). The third mission can be achieved by exchanging knowledge, which also comprises knowledge transfer. Following the definition of the European Association of KT Professionals (ASTP), knowledge transfer can be described as "a set of activities, processes and skills that enable partners to collaborate closely to advance ideas that deliver commercial, environmental, cultural and societal benefits" (ASTP, n.d.).

Knowledge transfer (KT) is important for numerous reasons. Firstly, there is a general pressure to create a better society and thus transferring knowledge in such a way that society benefits from it is important (Miller et al., 2016). Another reason for more attention to KT is that university-industry collaborations can lead to new research insights (d'Este & Perkmann, 2011). Furthermore, getting funding can be hard and with the help of industry partners this gap can become smaller (d'Este & Perkmann, 2011). Another often named reason is to stimulate innovation (Sjöö & Hellström, 2019). KT stimulates innovation and economic growth because scientific knowledge can lead to (non)-commercial developments (Bercovitz & Feldmann, 2006; Benneworth & Jongbloed, 2010). The call for innovation nowadays is big (European Commission 2017), hence the increased importance of a well-functioning KT.

It is thus widely acknowledged that KT is important. Researchers have various motivations to engage in KT, such as access to funding, new research insights or personal income (d'Este & Perkmann, 2011). The benefit a researcher gets from KT depends on the process of KT. Possibly, a knowledge transfer office (KTO) or technology transfer office (TTO) is involved in the KT process, which typically helps with legal, administrative, or financial matters of which researchers have little knowledge, expertise, or resources (Alexander & Martin, 2013).

In STEM research (science, technology, engineering, and mathematics), it is sometimes perceived as a problem when researchers do not consult a KTO. Some researchers for

instance publish their results too quickly, which is detrimental for IP protection (Backs, Günther, & Stummer, 2019). It is seen as problematic when researchers are not aware of the existence of a TTO or when they do not contact a TTO in the right stage (Huyghe, Knockaert, Piva, & Wright, 2016; Goel & Göktepe-Hultén, 2018).

It is however a misconception that not consulting a KTO is always a problem. When the researcher has sufficient resources to do the KT activity without help, the role of the KTO becomes redundant. Direct interactions between researchers and industry could therefore work just as effective as interactions with a KTO involved. This argument is supported by research that indicates that KTO service quality does not play a role in patenting activities when the researcher is experienced and has a consolidated career (Olaya-Escobar, Berbegal-Mirabent, Alegre, 2020). Furthermore, SSH (social sciences and humanities[1]) researchers generally engage more in informal KT activities (Castro-Martínez, Molas-Gallart, & Olmos-Peñuela, 2011; Olmos-Peñuela, Benneworth, Castro-Martínez, 2013a), meaning activities where no contract is used (Grimpe & Hussinger, 2013). Although engaging in informal KT activities is not the same as engaging in activities without the involvement of a KTO, these concepts could be related (Olmos-Peñuela, Castro-Martínez, & d'Este, 2014). For instance, for an informal ad hoc advice, the KTO seems less necessary than for patenting, or at least, the KTO is involved differently than when an invention could be patented.

The question therefore rises what the added value is of consulting a KTO for SSHA researchers. The objective of this study is to find out how a KTO can be of benefit to SSHA researchers. Previous research has focused on explaining when academics (do not) consult KTOs, mostly regarding formal processes in STEM research (Goel & Göktepe-Hultén, 2018). There is a lack of understanding if and how a KTO can be of benefit to SSHA researchers. The research question is therefore as follows: *What determines the perceived benefits of a KTO for SSHA-researchers when engaging in KT?*

1.2 Relevance
Theoretical relevance
KT has become a research field of its own. A lot of studies focused on STEM research, often on TT and on the appropriation and utilization of IPRs. Not many studies are done on KT in

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[1] Some studies use the term SSH and some the term SSHA (Social Sciences, Humanities and Arts). As the Humanities and Arts disciplines overlap, this distinction is not relevant for this study. See also chapter 3.3.

SSH research (Olmos-Peñuela, et al., 2014). Illustrative is that the SSHA disciplines are different but grouped together to create more attention and focus (Hockaday, 2020). A first reason for the lack of attention could be that the impact of SSHA research is difficult to measure. Above all, informal processes, that are widely found in SSH research (Castro-Martínez et al., 2011), are harder to capture and quantify (Olmos-Peñuela, Molas-Gallart, & Castro-Martinez, 2013b). Another reason for the lack of research on KT in SSHA research might be the narrow economic focus on patenting, licensing, and technology transfer (Benneworth & Jongbloed, 2010). More research is needed on KT in SSHA research. SSH research is after all not less useful to society than STEM research (Olmos-Peñuela, Benneworth & Castro-Martinez, 2013; Hughes et al., 2011). It is however different (Olmos-Peñuela et al., 2013a), which makes it interesting to study. Since SSH researchers use a lot of informal activities when collaborating with non-academic partners (Olmos-Peñuela et al., 2013a; Castro-Martínez et al., 2011), it is interesting to study what role a KTO can play in KT. It is unclear how the involvement of a KTO influences the benefits that researchers get when participating in KT activities. Literature on a KTO's role in assisting non-commercialization practices is scarce (Zhou & Tang, 2020). Most studies focus on the role of KTOs in patenting, licensing and recently also spin-offs (Siegel, Veugelers, & Wright, 2007), while other activities could deliver substantial impact as well (Abreu & Grinevich, 2014).

This study contributes to the little existing literature by studying the context of a Dutch university. Since the relation between the involvement of KTOs and the benefits of KT for SSHA researchers has not been studied yet, a qualitative approach fits best for this study as it can create an in-depth understanding. Many scholars studied the motivations of researchers to engage in KT (Perkmann, Salandra, Tartari, McKelvey, & Hughes, 2021). The benefits that a researcher gets from KT however, have not been investigated previously. Literature on the degree of involvement of a KTO and the researchers' perception of KTO quality is also lacking. Indicators for the type, degree, and quality of KTO involvement are needed. Since the researcher is an essential element in the KT process, the perspective of the researcher is an important point of view. An individual approach on KT is therefore taken to find out perceived benefits of KT and how a KTO can affect this.

Practical relevance
This study is relevant for universities and other higher education institutes that want to set up or improve their KT processes in SSHA, and for SSHA researchers. For universities and

higher education institutes with KTOs it is interesting to see how the involvement of the KTO can be beneficial for SSHA researchers that take part in KT activities. More specifically, it can give existing KTOs more insights into how the KT processes work in SSHA research and how its involvement can be beneficial or a barrier to researchers. On basis of the results, they can improve their work and strategy by knowing when they are useful to researchers in SSHA and the difference with STEM research. In this way, SSHA researchers can benefit from this study as well. For universities or other higher education institutes without a KTO, this study gives an idea of the benefit of a possible KTO and more insight into motivations of SSHA researchers. Furthermore, public and private research institutes can use this study to improve KT processes. Possibly even companies can benefit from this research by getting insight into the KT processes for SSHA research. Ultimately, this study is relevant for SSHA researchers as they can learn from the KT processes of other SSHA researchers.

1.3 Scope

This thesis focuses on KT in Dutch universities that have a SSHA department, such as broad universities or more socially oriented universities. The reason for the narrow geographical scope is that countries can differ substantially in (contextual) circumstances regarding the relation between university, government, industry and society (Cerver Romero et al., 2020). Furthermore, the focus in this study is on KT, which is more specific than knowledge exchange but less specific than TT and entrepreneurship. The reason for studying KT is that a lot of non-technological KT processes take place in SSHA, so it gives a more complete picture of the KT process than TT would. Moreover, it fits with the need of focusing less on appropriating or utilizing IPR when researching KT (Holgersson & Aaboen, 2019; Compagnucci & Spigarelli, 2020).

1.4 Outline chapter

In the second chapter the theoretical framework underlying the research question is discussed. The third chapter elaborates on the methodology used in this study, including a description of the researched cases. The fourth chapter discusses the results. In the fifth chapter a discussion and conclusion are presented.

2. Theoretical framework

This chapters starts with explaining possible KT activities, various motivations of researchers to engage in KT and the possible benefits it can create. Subsequently, the type and degree of the KTO's involvement are discussed and theory about researchers' perception of KTO quality is examined. The chapter ends in a theoretical framework, accompanied by a conceptual model that aims to explain the relations between the concepts.

2.1 KT activities

2.1.1. Scope of activities

The term knowledge transfer has many variations in literature (De Wit-de Vries, Dolfsma, van der Windt, & Gerkema, 2018). Following the definition of the European Association of KT Professionals (ASTP), knowledge transfer can be described as "a set of activities, processes and skills that enable partners to collaborate closely to advance ideas that deliver commercial, environmental, cultural and societal benefits" (ASTP, n.d.). By engaging in KT, researchers thus engage in activities that deliver commercial, environmental, cultural, and societal benefits. The engagement of researchers in this thesis comprises not only engagement with industry, but also with society, industry, government, and the environment. This broad use of 'engagement' is in line with the triple, quadruple and quintuple helix that proposes to stimulate knowledge flows between those five actors (Baccarne et al., 2016). The clearest way to distinguish KT from concepts such as university industry collaborations and academic engagement, is to describe the scope of activities that it includes.

KT activities can be seen as activities or channels through which KT becomes possible. Various channels create ways of transferring knowledge from academia to non-academia. Broadly, KT activities can be divided into research commercialization, academic engagement, and some other channels (Ishizaka, Pickernell, Huang, & Senyard, 2020). Research commercialization includes spinouts, patenting, and licensing. Academic engagement can be described as "knowledge-related interactions by academic researchers with non-academic organizations, as distinct from teaching and commercialization" (Perkmann et al., 2021, p. 423). This includes consultancy, contract research, collaborative research, networking, and informal activities such as providing ad hoc advice (Perkmann et al., 2021). It also includes exhibitions and performances (Richmond, McCutcheon, & Cullen, 2008), facilities-related services (Ishizaka et al., 2020) and publishing books for a general audience (Abreu &

Grinevich, 2013). Related to these KT activities are publications and presentations, that can be the result of KT (Campbell et al., 2020). Teaching and professional development are also related to KT activities, but these are not seen as commercialization or academic engagement by the VSNU and by practitioners (VSNU, 2013). More recently, it has been recognized that commercialization is not the only KT activity with which KTOs can and should help (Holgersson & Aaboen, 2019; Zhou & Tang, 2020).

Furthermore, an often-used term in academic literature is university-industry collaboration (UIC). This term refers to knowledge *exchange* between higher educational systems and industry (Ankrah & Al-Tabbaa, 2015). As mentioned before, knowledge exchange is broader than knowledge transfer so in this sense the scope of UIC is broader. No consensus seems to exist in scope of KT activities that university-industry relations comprise, however usually it includes a range of activities (Ankrah & Al-Tabbaa, 2015; Mascarenhas, Ferreira, & Marques, 2018; Nsanzumuhire & Groot, 2020; Vick & Robertson, 2017).

To determine the benefits of knowledge transfer for SSHA-researchers, all KT activities must be considered, as also stressed by Olmos-Peñuela et al. (2014). Only then a complete picture of benefits from KT can be drawn. After all, different benefits are related to different activities, as shown later in this chapter. The above-mentioned KT activities are therefore all considered for this research.

2.1.2. (In)formal KT activities

A possible distinction in KT activities is whether the activity is formal or informal. Scholars have reached no consensus on the definition of (in)formal activities. On the one hand, authors refer to informal and formal activities as the more traditional ways of transferring knowledge, via IPR, versus the more relational ways. Link, Siegel & Bozeman (2007) describe informal KT as informal communication processes such as collaborative research, technical assistance, or consulting. They make this distinction because formal mechanisms would often focus on the allocation of property rights such as patents, while IPR is not the focus in informal mechanisms. The distinction made by Abreu & Grinevich (2013) resembles this definition. They distinguish formal commercial activities such as licensing and spin-offs (where IP protection is generally appropriate), informal commercial activities such as consultancy and contract research (where IP protection is less appropriate) and non-commercial activities such as informal advice and public lectures (where IP protection is not appropriate).

Other authors find this mostly IP-based definition problematic. Instead, they define informal KT activities as activities that do not involve a contractual relationship between the researcher and firm, and formal KT activities as activities that are based on a contract (Grimpe & Hussinger, 2013; Castro-Martínez et al., 2011; Llopis, Sánchez-Barrioluengo, Olmos-Peñuela, & Castro-Martínez, 2018; Olmos-Peñuela et al., 2014). In this definition collaborative research or contract research, which some authors would classify as informal activities (Link et al., 2007; Abreu & Grinevich, 2013), do not fall under the scope of informal activities, as collaborative research is often based on some sort of contract. In line with this definition, formal KT usually takes place via the research institution, while informal KT does not (Olmos-Peñuela et. al, 2014).

A final point to consider is that formal and informal KT activities possibly could complement each other. Results on this are varied. Some find support for this idea: informal KT activities could improve the quality of formal KT activities (Grimpe & Hussinger, 2013; Schaeffer, Öcalan-Özel, & Pénin, 2018), and academics would engage simultaneously in unpaid and paid KT activities (Amara, Landry, & Halilem, 2013). However, Olmos-Peñuela et al. (2014) do not find exclusively complementary effects between formal and informal KT activities. Abreu & Grinevich (2013) find a more contrasting result, namely that academics rarely use both formal and informal KT mechanisms. This last difference in results could be caused by a different scope or methodology used to describe formal and informal KT. Although opinions are thus divided, it is important to be aware of informal and formal KT activities happening simultaneously.

In this study, informal KT activities are described as activities that do not involve a contract. It is important to keep in mind that the absence of a contract can make the activity harder to capture (Olmos-Peñuela et al., 2014). The institution has no full control over informal activities but may gather information about them if they can (Llopis et al., 2018).

2.1.3. KT activities of SSHA researchers

When discussing KT in SSHA research it is firstly important to notice that the disciplines social sciences, humanities and arts have been grouped together to create more focus but are different from each other (Hockaday, 2020). Apart from SSH researchers generally engaging more in informal KT activities (Castro-Martínez et al., 2011; Olmos-Peñuela et al., 2013a), not much is known about the KT activities SSHA researchers engage in. No studies indicate a difference in a general degree of participation in KT activities by SSHA researchers or by

STEM researchers. SSH researchers are just as user-oriented as STEM researchers, only more focused on national communities (Olmos-Peñuela, et al., 2013a). SSHA researchers actively engage in KT activities. Researchers in social sciences engage more in informal commercial activities, while academics in arts and humanities engage more in informal non-commercial activities (Abreu & Grinevich, 2013). Typical KT activities for SSHA researchers to engage in are consulting and contract research (Hockaday, 2020; Olmos-Peñuela et al., 2014). Furthermore, SSH (and health) researchers may cooperate more with government agencies than researchers from other disciplines (Ramos-Vielba, Sánchez-Barrioluengo, & Woolley, 2015). Previous scholars also suggests that SSH researchers are far more likely to engage in popularization activities such as publications of articles in newspapers or books, participation in radio or TV programs and science weeks (Olmos-Peñuela et al., 2013a). Last but not least it is implied that SSHA spinouts are less likely to be in need of big financial (external) investments compared to other disciplines (Hocakday, 2020).

2.2 Motivations to engage in KT

Recently the amount of research on motivations of academics to engage with industry has grown in amount (Perkmann et al., 2021). Previous scholars indicate that motivations can differ for various possible KT activities (Neves & Brito, 2020). The next paragraphs discuss six categories of motivations that are identified in the literature for researchers to engage in KT or for academic engagement: access to funding, learning, access to in-kind resources, commercialization, career related and pro-social motivations. The first four categories are named after the categories of motivations that d'Este & Perkmann (2011) distinguish in their study on academic engagement in the physical sciences and engineering faculty in UK. Of these four categories, the first three motivations, so funding, learning and access to in-kind resources are research related. The fourth motivation, commercialization, is often seen as not research related. The fifth and sixth motivation distinguished in this study, career related and pro-social motivation, are derived from other studies (Neves & Brito, 2020; Iorio, Labory, & Rentocchini, 2017; Ramos-Vielba et al., 2015).

These six categories together comprise the various kinds of motivations that studies have recognized in academics engaging in KT activities. They comprise intrinsic as well as extrinsic motivations and could be intertwined and affect each other (Lam, 2011; Ramos-Vielba et al., 2015). Almost no studies discuss motivations of SSHA researchers to engage in KT. One study suggests that only marginal differences exist between SSH researchers and

researchers from other disciplines (Hayden, Weiß, Pechriggl, & Wutti, 2018). The next paragraphs, that discuss motivations of researchers to engage in KT, also include some evidence on the motivations of SSHA researchers specifically.

2.2.1. Access to funding

Access to funding is a research related motivation; getting more access to funding means financial constraints on the research are less likely. Since doing research is the main job of researchers, it is not surprising that access to funding is one of the most frequently found motivational factors for academics to engage in some sort of KT activity (d'Este & Perkmann, 2011; Lam, 2011; Lee, 2000). Several studies also found that access to funding is relatively the most important motivational factor for researchers to engage in KT (for example Iorio et al., 2017; Ramos-Vielba et al., 2015; Tartari & Breschi, 2012).

Access to funding can be a motivational factor for various KT activities. Researchers with a main motivation to get access to funding more often engage in joint research, contract research and consulting (d'Este & Perkmann, 2011). Several studies show that access to funding is (also) a motivational factor for spin-off creation, patenting, industry collaboration and these three activities together (academic entrepreneurship) (Neves & Brito, 2020). No studies have investigated possible differences in the funding motivation between SSHA researchers and researchers from other disciplines when engaging in KT activities.

2.2.2. Learning through engaging

A second research related motivational factor for academics to engage in KT activities is to learn (d'Este & Perkman, 2011). This motivational factor, also called the 'puzzle' solving motivation (Stephan & Levin, 1992; Lam, 2011) is the intrinsic reward of discovery and curiosity (Huyghe et al., 2016), the attraction of intellectual pursuit. Learning includes getting new research insights for example, a frequently named motivation for academic engagement (Hughes et al., 2016; Ankrah, Burgess, Grimshaw, & Shaw, 2013). Getting new research insights can be possible via creating joint research proposals, but also via informal advice or via spin-off activities. The industry can benefit from researcher's knowledge, while the researchers can learn from the industry. The desire to learn is thus a stimulus for engaging in various KT activities. This is especially the case for research and consulting; activities that involve a relational component with the industry (d'Este & Perkmann, 2011).

2.2.3. Access to in-kind resources

Access to in-kind resources, such as equipment, materials and data, is a research related motivation for researchers to engage in KT (d'Este & Perkmann, 2011; Lam, 2011; Lee, 2000). Previous research indicates that researchers that regard access to in-kind resources as an important motivational factor for engagement, generally engage less frequently in contract research, consulting, spin-offs, and patenting and also not more frequently in joint research (d'Este & Perkmann, 2011).

2.2.4. Commercialization

While the last three motivations were research-related, commercialization as a motivational factor for researchers to participate in KT activities is not directly related to research. Commercialization involves monetary incentives, for example the aim of getting personal income from licenses. This motivation is also identified in literature as the 'gold' motivation (Stephan & Levin, 1992). Academics' motivation to engage might be more often research related than commercialization related (Lam, 2011; d'Este & Perkmann, 2011). This is in line with the argument that money is no motivator but a hygiene factor (Herzberg, 1966).

Researchers that do regard commercialization as main motivation, generally engage more in spin-off activities, consulting, and patenting than in other KT activities (d'Este & Perkmann, 2011). This contrasts with researchers engaging in KT activities with a research-related motivation; often those activities are collaboration-based (d'Este & Perkmann, 2011). Pecuniary motivations can lead to formal or informal KT activities. A reason to participate in informal activities such as conferences or courses is that income usually can be received directly, while income from formal activities is bound by more restrictions of the institution that regulates the income (Llopis et al., 2018). Lastly, one study indicates that SSH research groups are less motivated by accessing financial resources than research groups in the health faculty, but not significantly less than groups in other disciplines (Ramos-Vielba et al., 2015).

2.2.5. Career related

A fifth category of motivations researchers can have for participating in KT activities is career related. A researcher can aim for recognition in the (scientific) community, for publicity and for press. Researchers use commercialization to get access to resources in order to get professional recognition and career rewards (Lam, 2011). This so called 'ribbon' motivation (Stephan & Levin, 1992) is an extrinsic motivation to get more visible in the academia or to

be praised (Iorio et al., 2017). Career success is recognized as motivational factor for academics engaging in spin-off activity (Fini, Grimaldi, & Sobrero, 2009; Hayter, 2011), patenting (Walter, Ihl, Mauer, & Brettel, 2018) and industry collaboration (Tartari, Perkmann, & Salter, 2014). A career-related motivation is also the motivation to improve research quality. Finally, some researchers experience an affective duty to participate in KT activities (Huyghe & Knockaert, 2015), to find job placement for students and material for teaching for example (Abreu & Grinevich, 2014).

2.2.6. Pro-social motivation

A sixth category of motivations researchers have for taking part in KT activities can be described as pro-social motivations. Intrinsic satisfaction can be derived from KT activities when researchers feel the need to contribute to the third mission of universities. This 'mission'-motivation (Iorio et al., 2017) thus is present in researchers that are moved by a pro-social, moral driver of making impact (Hockaday, 2020). Researchers that have higher degree of pro-social motivation also engage more often in academic entrepreneurship (Iorio et al., 2017) and other KT activities (Ramos-Vielba et al., 2015). Moreover, researchers that are more concerned with the societal impact of their research, may have more direct interactions with the beneficiaries of their research (Olmos-Peñuela et al., 2014). Because SSH researchers are often occupied with questions relevant to society and public policy, they appreciate KT (Wutti & Hayden, 2017), and therefore might especially have this kind of motivation. Research indicates that SSH researchers are motivated more by knowledge application than research groups from different disciplines (Ramos-Vielba et al., 2015).

2.3 Perceived benefits of KT

As described in 2.2, a researcher can have various motivations for engaging in KT activities. Following the explanation of self-determination theory on motivation (Deci & Ryan, 2000; Gagne & Deci, 2005), researchers are motivated when they believe their behavior leads to desirable outcomes. The motivation of the researcher to engage in KT can resemble the perceived benefit of KT; the desirable outcome. It can however also differ. A researcher that primarily engages in KT to get research funding, could for example mainly end up being satisfied by the contribution that KT has to society, or end up with new research insights. Motivations are therefore related to perceived benefits but are not the same. The relations between these concepts are explained in the theoretical framework in 2.5.

2.4 KTO

All universities in the Netherlands have a KTO or TTO that supports the process of knowledge transfer (VSNU, 2019). A KTO can have an external, internal, or mixed structure (Brescia, Colombo, & Landoni, 2016). In the Netherlands, the KTOs or TTOs are all internal (VSNU, 2019). Within an internal structure, there can be one KTO for all disciplines and activities, or more KTOs for different disciplines or activities (Brescia et al., 2016). This paragraph discusses the theories on how the KTO is involved in the KT process of the researcher. In 2.4.1 the type of KTO involvement is examined, 2.4.2 discusses the degree of a KTO's involvement, and 2.4.3 addresses the perceived KTO quality.

2.4.1. Type of involvement

Previous studies looked at capabilities, roles, and tasks of the KTO. This thesis combines insights from these studies to analyze the type of KTO involvement. Important to keep in mind is that much of the literature focuses on STEM research and not on SSHA research.

A first capability with which the KTO can help researcher is the ability to build partnerships between researchers and actors outside academia (Weckowska, 2014). In this boundary-spanning role the KTO is a central connector in the network of scientists, firms, and university administrators (Kreiling & Bounfour, 2020; Siegel, Waldman, Atwater, & Link, 2004; Alexander & Martin, 2013). When a KTO knows the motives of different partners (Ankrah et al., 2013), it can ensure understanding between them and match partners (Stemberkova, Maresova, David, & Adeoye, 2020). In this position the KTO can overcome cultural differences between science and business and change the mindset of both partners (Kreiling & Bounfour, 2020). The position between scientists and industry also enables the KTO to settle conflicts and negotiate contracts and equity agreements (Weckowska, 2014).

Secondly, KTOs can help the KT process by being able to identify and act on opportunities in research and industry (Stemberkova et al., 2020), to recognize useful research outputs, assess inventions commercially, identify partners, licensees, and investors (Weckowska, 2014). For this, managing the knowledge base (Kreiling & Bounfour, 2020) is important. Understanding the researcher is after all crucial; without comprehending the research subject, it is difficult to help transfer knowledge.

Thirdly, a KTO can help researchers with the specific kind of KT activities. Brescia et al. (2016) broadly divided the tasks of a KTO in three categories: IP support, research support and spin-off support. IP support includes tasks regarding IPRs and licensing. KTOs receive

disclosures of inventions, assess them, decide on IP or commercialization strategy and assist in it, manage IP and search for and negotiate with licensees (Schoen, van Pottelsberghe de la Potterie, & Henkel, 2014; Meysman, Cleyn, & Braet, 2017; Weckowska, 2014). For patenting and licensing, enabling transfer of IP is important (Alexander & Martin, 2013). Research support includes tasks regarding legal agreements (supervising and supporting legal claims) and sponsored research or collaboration contracts (negotiating, drawing up contracts and administrative support). For contract research, consultancy, and collaborative research, it is important that a KTO can identify research projects, manage them and negotiate about price and contracts for example (Alexander & Martin, 2013). Spin-off support includes help around business plans and models, such as searching for investors, assessing feasibility, applying for funds and recruiting management (O'Shea, Allen, Chevalier, & Roche, 2005; Clarysse, Wright, Lockett, Van de Velde, & Vohora, 2005; Lockett & Wright, 2005). Facilitating entrepreneurship is an important task of a KTO for spinoff activity (Alexander & Martin, 2013).

2.4.2. Degree of involvement

The degree of involvement of the KTO refers to how intensively the KTO is involved in the KT process. Although no prior research is done on the degree of involvement of a KTO, it seems important when studying the involvement of a KTO. The degree of involvement could broadly be described in three levels: the KTO is consulted, the KTO supports, or the KTO leads the process. Firstly, when the KTO's role is limited to consulting, the researcher for example asks the KTO for advice on a specific topic such as checking clauses in an agreement. The KTO is then only shortly involved, making its role in the process quite small. Secondly, when the KTO's role is to support the researcher, the KTO is involved more throughout the process. The third option is that the KTO leads the researcher through the KT activity. The KTO then takes initiative and manages the process. The relationship between the KTO and the researcher may be different with such intensive contact opposed to with almost no contact. For example, research indicates that when TTOs adapt to the needs of the researcher, this enhances the researchers' involvement in commercialization (Derrick, 2015).

2.4.3. Perceived quality of KTO

The perceived quality of a KTO is the researcher's perception on how well he or she is assisted by the KTO. For this study the researchers' perception of KTO quality is taken and

not for example the KTO quality measured in the number of patents filed. Service quality in general (Parasuraman et al., 1985) has been studied widely, but the service quality of KTOs specifically has not received much attention in literature. One recent study investigated the perceived service quality of TTO's (Olaya-Escobar et al., 2020), operationalizing service quality as the reliability of the service, the infrastructure of the TTO and the staff quality.

Following this definition of perceived KTO quality, several aspects are expected to make up the perceived quality of the service provided by the KTO. Firstly, reliability refers to the quality and quantity of the service provided by the KTO. To provide a qualitatively and quantitatively reliable service, KTOs needs to have certain capabilities, as described in 2.4.1. For a reliable service, these resources must be used to understand and assist the researcher. Furthermore, it is crucial the KTO is knowledgeable about the research subject.

Secondly, infrastructure refers to physical facilities of a KTO and its size. These aspects affect the service quality of a KTO (Markman, Gianiodis, Phan, & Balkin, 2005); the capacity of the KTO should be sufficient to cover the KT support activities.

Thirdly, the quality of the staff refers to the experience, sensitivity, and empathy of the KTO staff. Experience in KT is crucial; previous research indicates that KTO experience increases researchers' engagement in patenting activities (Link & Siegel, 2005; Siegel, Wright, Chapple, & Lockett, 2008; Thursby & Thursby, 2002). Sensitivity refers to whether KTO employees are ready to help researchers at any time and whether the KTO offers the services as agreed. This could include giving the researcher the right expectation of the KT process. When researchers contact the KTO with unrealistic expectations, the KTO is left with the task to adjust these expectations. If not adjusted, it is likely that the researcher is not content with the quality of the KTO because he feels unassisted in achieving the desired outcome. Lastly, empathy refers to the extent that KTO employees are receptive and attentive and are perceived to be of assistance in the KT process. In order to be trusted, the KTO should make the researcher feel like he is understood. This is important as academics often do not see the KTO as legitimate (O'Kane, Mangematin, Geoghegan, & Fitzgerald, 2015).

2.5 Conceptual framework

Now the concepts are explained, but the relations between the concepts remain unclear. A few theories exist that can provide some direction for the relation between the concepts. This paragraph describes what relations might look like. A preliminary conceptual model is made based on these theories. The model is shown in Figure 1. In line with self-determination

theory on motivation, researchers are motivated when they believe their behavior leads to certain outcomes (Deci & Ryan, 2000; Gagne & Deci, 2005). These outcomes are shown in the model as the researchers' perception of benefits of KT. Between the motivation to engage in KT and the benefit that the researcher gets from KT, the KT activity takes place. When participating in a KT activity, the researcher can choose to involve a KTO. As explained in chapter 2.4, the involvement of a KTO can differ in type and degree. Lastly, the KTO quality could affect how the involvement of a KTO (type and degree) influences the perceived benefits of KT.
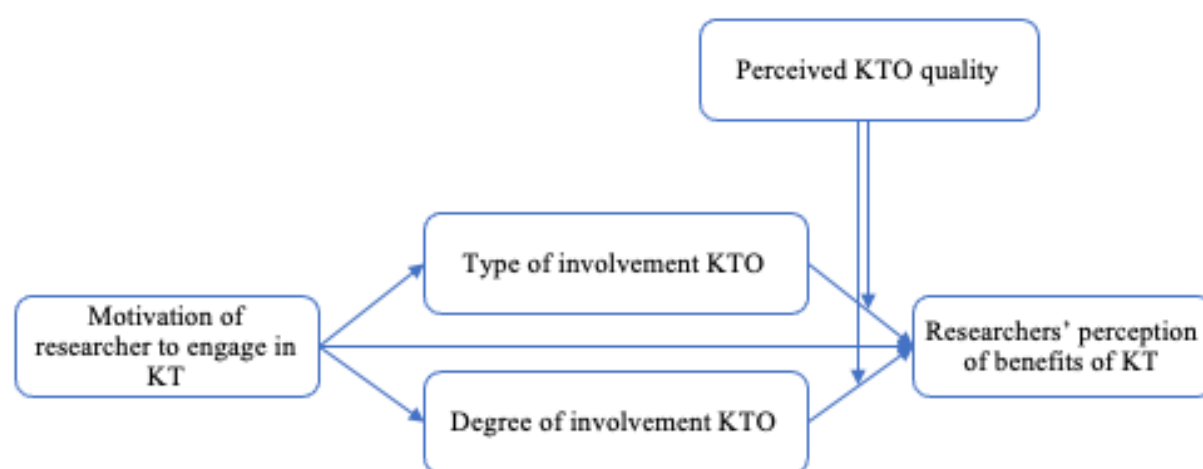

Figure 1: *preliminary conceptual model*

2.5.1 Motivation & involvement KTO

As described in 2.4.1, KTOs can assist in different KT activities, using several capabilities. The type of involvement of the KTO could be linked to the type of KT activity. For example, effective communication and negotiation could be important in building partnerships (e.g. collaborative research partnership), while legal and financial knowledge could be necessary in protecting potential IP (e.g. building application). Previous studies on motivations of researchers to engage in KT found that motivations could be associated with certain KT activities. For instance, researchers that regard learning as important motivational factor, would often engage in joint research, contract research and consulting, while researchers that regard commercialization as important motivational factor would often engage in patenting, spinoffs and consulting activities (d'Este & Perkmann, 2011). The type of KTO involvement might depend on the KT activity and might thus also be related to motivations of researchers. This is yet to be explored further. Next to this, it could be argued that for certain KT activities a more intense involvement of the KTO is needed.

2.5.2. Involvement KTO & perceived benefits KT

As described in 2.3, the perceived benefit could be the same as the reason why the researcher engages in KT. The benefit could however also be different from the original motivation. The KT process between the starting motivation and the desirable result for the researcher, can be supported by the KTO. The purpose of a KTO is to ensure a successful and effective KT process. Since the researcher is a vital actor in KT, a KTO should ensure the KT process is valuable for the researcher. A KTO thus needs to assist the researcher in KT activities. Assistance could be useful when a researcher does not have all the capabilities to create benefits from KT. A KTO could then complement the necessary capabilities. For instance, KTOs might reach more potential licensees of the invention than researchers, while a researcher can better mitigate information asymmetry through signaling (Carayol & Sterzi, 2011). Moreover, researchers could have limited time, interest, social networks, credibility, financial means, reliable contacts, and experience and therefore consult a KTO (Göktepe-Hulten, 2010). The KTO can thus be involved in various ways, complementing the researchers' capabilities. Since the motivation to engage in KT could possibly influence the type and degree of KTO involvement, and motivations could lead to several perceived benefits, it could be argued that the type and degree of KTO involvement influence the perceived benefits of KT. Still, this relation remains under researched.

2.5.3. KTO quality as a moderator

Various studies have indicated an effect of KTO quality related measures on engagement in patenting. The tendency of researchers to patent their research outcomes may become higher when the quality of the TTO is higher (Markman et al., 2005). The same is found for the TTO's experience (Link & Siegel, 2005; Siegel et al., 2008; Thursby & Thursby, 2002), the TTO's competence (Alexander & Martin, 2013; Siegel et al., 2007), the TTO's personnel capacities (Lockett & Wright, 2005; Markman et al., 2005; Rasmussen & Borch, 2010) and the TTO's expertise (Swamidass & Vulasa, 2009). A recent study found that when researchers have a positive perception of TTO service quality in terms of reliability, staff and infrastructure, they engage more in patenting activities (although only significant when the researcher does not have industry or research experience) (Olaya-Escobar et al., 2020). It can be argued that for other KT activities than patenting, the researchers' engagement also increases when the perceived quality of the KTO is higher. For patenting the KTO needs to

have IP management capabilities, but for collaborative research, negotiation skills are important (Alexander & Martin, 2013).

When researchers engage more in KT this could affect the perceived benefits of KT. In 2.5.2 it was argued that the involvement of the KTO could affect the perceived benefits of KT. The studies on or related to KTO quality that are named above, give reason to investigate whether this effect could be influenced by the perceived quality of the KTO. The importance of KTO quality is after all highlighted in literature: although essential, the breadth of services provided by the KTO might not be as important as the quality of the service (Owen-Smith & Powell 2001).

3. Methodology

In this chapter the methodology of this study is explained. The research design is explained, followed by an operationalization of concepts. Subsequently, a description of the case selection, data collection, data analysis and research ethics is presented.

3.1 Research design

In this thesis a qualitative research method is adopted. Although the motivations of researchers to engage in KT and various KT activities have been the subject of previous studies, the relations of these subjects with the type and degree of KTO involvement, the researchers' perception of benefits of KT and quality of KTO have not been explored yet. A qualitative approach is more suitable for such an exploratory research question than a quantitative approach (Yin, 2012). Where quantitative research starts with a clear expectation, qualitative research is useful for exploring new relations (Symon & Cassell, 2017). In addition, in a qualitative research, words are used rather than numbers to gain a deeper understanding of a real-life phenomenon (Creswell, 2013). As this study tries to discover what determines the perceived benefits of a KTO for a researcher that engages in KT, a qualitative research method is suitable. This approach makes it possible to capture the informal and the formal KT activities.

Due to the exploratory nature of this research, a case study is a useful method rather than a survey or an experiment (Rowley, 2002). Via a case study, a social phenomenon and its underlying reasons can be studied in its natural context (Creswell, 2013). This makes a case study an appropriate research method, as the motivations and perceptions of researchers about the involvement of a KTO are social of nature and the relation with the benefits of KT is complex. The subjective perception of the informants can be taken into account in a case study (Symon & Cassell, 2017), which is essential as this research aims to study the perceptions of researchers. This study is based on multiple cases rather than a single case, because of the numerous possible motivations, KT activities, types of KTO involvement and benefits of KT activities. Within a multiple case study, cases can be compared to each other (Baxter & Jacks, 2006), making it an appropriate method for this study. Moreover, the study aims to get insights from researchers in SSHA, which comprises various disciplines. A single case study would therefore weaken the transferability of results compared to when a multiple case study is conducted (Yin, 2009; Symon & Cassell, 2017).

3.2 Operationalization

Although the main concepts are extensively explained in chapter 2, an overview is presented in table 1. The interview questions (see appendix) cover the dimensions shown in table 1. Important to note is that the dimensions and indicators of motivations to engage in KT are derived from studies that often focus on STEM researchers and not (solely) on SSHA researchers. Likewise, the dimensions and indicators of KTO quality are derived from the measures of Olaya-Escobar et al. (2020), who studied the KTO quality in a university that is specialized in the fields of engineering, architecture, sciences, and technology. Furthermore, the operationalization shows many (sometimes overlapping) measures regarding type of KTO involvement. Since the nature of this study is explorative, it was decided to have a broad range of possible indicators of the type of KTO involvement.

Table 1: operationalization

Construct	Dimension	Indicator	Source
KT activities	Commercial activities	Spinouts	e.g. Neves & Brito, 2020
		Patenting	
		Licensing	
	Academic engagement	Consultancy	e.g. Perkmann et al., 2021
		Contract research	
		Collaborative research	
		Providing ad-hoc advice or other informal contacts	
		Networking	
		Exhibitions	Richmond, McCutcheon, & Cullen, 2008
		Performances	
		Facilities-related services	Ishizaka et al., 2020
		Publishing books for a general audience	Abreu & Grinevich, 2013
Motivation	Access to funding	- Funding from industry - Funding from government	d'Este & Perkmann, 2011
	Learning	- Research insights - information on industry problems - feedback from industry - information on industry research - applicability of research - becoming part of a network	d'Este & Perkmann, 2011
	Access to in-kind resources	- access to materials (such as data) - access to research expertise - access to equipment	d'Este & Perkmann, 2011
	Commercia-lization	- personal income - seeking IPRs	d'Este & Perkmann, 2011

	Career-related	- Recognition (scientific/society) - Career success (citation, publication, prizes, impact resume, praise, rewards, promotion) - Affective duty - Improve quality of research	Neves & Brito, 2020
	Pro-social (satisfaction & praise from contributing to society at large)	-Apply one's own expertise to practical social, economic, or technical problems -See application of research findings -Extending university mission -Diffusion of a particular technology -Diffusing key research findings -Promoting local development -Improving the reputation of science	Iorio et al., 2017 & Ramos-Vielba et al., 2015
KTO involve-ment	Type	Boundary-spanning	e.g. Alexander & Martin, 2013; Weckowska, 2014
		- Identify/act on opportunities - Recognize useful research outputs - Assess inventions commercially - Identify partners, licensees, and investors	e.g. Stemberkova et al., 2020; Weckowska, 2014
		- IP support: IPR & licensing - Research support: legal agreements & sponsored research/collaboration contracts - Spin off support: business plan/business model	Brescia et al., 2016
	Degree	Consult	
		Support	
		Lead or manage process	
KTO quality	Reliability	- KTO provides information on commercial viability of invention - KTO advises in business area - KTO offers sufficient legal advice - KTO has flexible policies for KT - KTO dedicates necessary resources	Olaya-Escobar et al., 2020
	Infrastructure	- KTO physical facilities are visually attractive & modern - Size of KTO is sufficient to cover KT activities	
	Staff quality	- KTO employees have knowledge about KT (Experience) - KTO employees are ready to help at any time (Sensitivity) - KTO offers services as agreed (Sensitivity) - KTO employees are receptive and attentive (empathy) - KTO employees are of great help (empathy)	

3.3 Case selection

Interviews are held with ten informants in total. An overview of the informants is shown in table 2. Informants are selected via non-probability sampling, more specific heterogeneous purposive sampling. In a purposive sampling technique, cases are selected deliberately to ensure the necessary information is provided by the case (Maxwell, 1996). In a heterogenous

purposive sampling technique, the cases are selected based on diverse characteristics, ensuring that maximum variation is present in the collected data (Symon & Cassell, 2017).

In this study, such deliberate selection is necessary to provide evidence from the different disciplines within SSHA and to compare the (explanations for) the perceived benefits from KT. By interviewing ten informants, it is made sure that the cases vary in characteristics and enough evidence is available from the various disciplines within the SSHA department to be able to make the results transferable. The strength of a heterogeneous purposive sampling technique is that when patterns occur in cases that are not alike, it is likely that these patterns point towards interesting findings (Patton, 2002). All ten informants are researchers at the Radboud University. By choosing to investigate one university, there will be some homogeneity across the sample, allowing for an in-depth analysis of differences between the researchers (Symon & Cassell, 2017). In non-probability sampling, no hard rules regarding sample size exist (Symon & Cassell, 2017). The number of informants rather depends on the research characteristics; what is studied, what information is needed from the informants and what leads to more credibility (Patton, 2002). In this study ten informants suffices for a dependable sample in order to explore (rather than confirm) theories around the perceived benefits of KT by researchers.

From the ten informants, eight have consulted a KTO before or during their KT activity and two have not consulted a KTO. This selection is made because the main aim of this research is to study researchers' perception of KT when a KTO is involved. To be able to say something about the involvement of the KTO, it is useful to explore reasons why some researchers have not consulted a KTO. In this way, insights can be provided on how the KTO can be of use to the researcher and how the KTO could hinder the researcher.

Important to note is that no clear-cut distinction exists between Social Sciences, Humanities and Arts. The Radboud University has a faculty of Arts, a faculty of Philosophy, Theology, and Religious studies, a faculty of Social Sciences, a faculty of Management and a faculty of Law. There is thus no faculty of Humanities. This does not mean that Humanities is not represented as discipline at the Radboud University: it could be said that the faculty of Arts and the faculty of Philosophy, Theology, and Religious Studies both fall under the umbrella term 'Humanities'. Humanities is often viewed as a broad concept. Sometimes Arts and Humanities are seen as one category. Next to this, it is common in the Netherlands that studies of management and law are accommodated in separate faculties. For purposes of this

study, these faculties are also incorporated in the Humanities and Social Sciences. Lastly, research can be interdisciplinary and overlap. The distinction between the SSHA sciences is thus not clear-cut.

Table 2: Case selection

Informant	Discipline	Research field	KTO consulted	KT activity
1	Arts	History	Yes	Exhibition
2	Arts/social sciences	History	Yes	Collaboration with public and government of other country, digitalization
3	Arts/social sciences	Language (& philosophy & education)	Yes	Exhibitions, make education material
4	Arts/ humanities	Archaeology	No	(International) exhibitions, public-oriented book and articles, interviews
5	Arts/social sciences	Language & education	Yes	Non-commercial spinout collaboration, licensing (building applications)
6	Arts	History	Yes	Exhibition, tv show contribution, short movie collaboration, public-oriented books, collaboration, creation of foundation
7	Arts/social sciences	Language and AI	Yes	Collaboration with company
8	Arts	Arts & Culture Studies	No	Collaborations, short movie, exhibition, public-oriented book
9	Social sciences/ humanities	Public Administration	Yes	Spinout (building application & website)
10	Arts	History	Yes	Collaboration with public, digitalization

3.4 Data collection

Data are mainly collected in this study via semi-structured interviews. Interviews are complex social activities, that can, among other things, help the researcher to understand people's motives and perception (Symon & Cassell, 2017). An interview is therefore an appropriate method, as this study aims for an understanding of the researchers' perceptions of benefits of the KTO. The interviews are semi-structured, meaning the questions are designed beforehand while leaving space for follow-up questions and possible changes in sequence (Symon & Cassell, 2017). The questions are open ended, so the respondent has the possibility to explain his thoughts carefully (Yin, 2012). The question list can be found in the appendix.

Credibility is ensured by member checking, meaning that a record of understandings and choices is kept, and progressive subjectivity, meaning that interpretations are tested with the informants throughout the process (Symon & Casell, 2017). Furthermore, a research diary is kept in order to ensure dependability.

3.5 Data analysis

The data analysis firstly consists of the transcription of the interviews. To ensure credibility, peer debriefing is applied, which means that the transcripts are sent to the interviewees to check whether the transcripts are accurate. When transcription is done, the transcripts of the interviews are analyzed one by one and afterwards compared. Template analysis is used as a data analysis technique in this research, as it can ensure both structure and flexibility (Symon & Cassell, 2017) and is more appropriate than a grounded theory approach (Glaser & Strauss, 1967) because some theory exists on the subject. Central in the template analysis is the coding process, which is also used in this research to investigate motivations for KT engagement, the perceived benefits to KT and the perception about KTO quality. The program ATLAS.TI is used to assist in the coding process. Some themes are known a priori, such as the various possible motivations that researchers have for engaging in KT or the several KT activities. Template analysis allows a priori themes to some extent, which meets the needs of this study. It is a mix between a rather inductive way of coding and a deductive way of coding (Symon & Cassell, 2017). In template analysis, codes are organized hierarchically, with higher order and lower order codes. The coding schemes and steps can be seen in appendix.

3.6 Research ethics

Several measures are taken to ensure that research ethics are taken into account. The informants, that all participate voluntarily, are all informed about the research process beforehand. Before starting the interview, they are asked whether they object to being recorded during the interview. The informants are informed that the results are only used for research purpose. The names of the informants are anonymized in this thesis, to ensure their privacy. As already mentioned, the interview transcripts are sent to the informants afterwards to ensure the accurateness of the transcripts. Before publication, the whole thesis is sent to the informants, and they are given the chance to object to any information in the thesis about their case. The final version of the thesis is also sent to the informants.

4. Results

This chapter discusses the results and starts with an examination of the KT activities, followed by the type and degree of KTO involvement. Subsequently, the motivations for engaging in KT and the perceived benefits of KT are presented. Then, findings on KTO quality are described, after which a possible relation between KTO's involvement and researchers' motivations is presented. The chapter ends with a proposed conceptual framework.

4.1 KT activities

The case selection (table 2) includes an overview of all the KT activities informants engaged in. Except for informant 1 (a young PhD) every informant had engaged in more than one KT activity. The informants were involved in different activities. Some activities were done by several informants. Five informants for example organized or gave advice for an exhibition, three informants wrote a book for a general audience, two informants created an application and several informants engaged in collaborations with people outside the academia. Others were involved in more distinct activities, like creating a foundation and digitalizing information.

4.2 KTO involvement

The informants involved the KTO in the starting phase of KT. Informant 1 went to see if someone could help him with the KT process once he had written down the project to some extent. Informants 5 and 9 said that the contact with the KTO officer was more coincidental than planned. Informant 5 contacted the KTO in the start of her project; informant 9 said he had already started the project when he contacted the KTO. Informant 7 also contacted the KTO in an early stage. Informant 3 contacted the KTO for most of his KT projects in an early stage. He saw this as important: one KT project did not work out and he thinks that this failure could have been prevented through screening: *"…if I really had the screening of more people from … [KTO Officer]'s department of how realistic it was, then eh yes. Or had received support like 'well if you want it, then you have to do it like this. (…) that road does not lead to what you want, you must choose another road. The goal may be the same, but you chose the wrong method, the wrong route.' They could have saved me from that once. But hey, that also depends on your own stubbornness, isn't it."* Since this failed project hindered the researcher to get benefits from KT, the following proposition emerges:

Proposition 1: the moment the KTO is consulted influences the researchers' perception of benefits of KT.

4.2.1. Type of involvement

All the informants who consulted a KTO mentioned how the KTO was involved in the organization of the KT activity. An overview of the types of involvement is shown in table 3.

Table 3: Type KTO involvement

Informant	Type KTO involvement					
	Legal, administrative, or financial	University process guidance	Business development	Negotiation	Abstract: mirroring, thinking along, etc.	Connecting/ boundary-spanning
1		Yes				
2	Little	Yes			Yes	
3	Yes	Yes		Yes	Yes	Yes
4	-					
5	Yes	Yes	Yes	Yes	Yes	
6	Yes	Yes				
7	Yes					Yes
8	-					
9	Yes				Yes	
10		Yes				

The KTO assisted informants 2, 3, 5, 6, 7 and 9 in practical issues where legal, financial, or administrative knowledge is necessary. Informant 6 mentioned that the KTO helped with financial and legal issues and issues surrounding the establishment of the foundation (arranging a notarial deed, appointing the board, and arranging salary with the university). When asked how the KTO officer helped concretely, informant 9 mentioned the KTO's support in contracts and in getting the right license for his KT project. For informant 5 the KTO contacted an external IP lawyer that set up documents that the informant had to check.

Informants 1, 5, and 6 explicitly mentioned the involvement of the KTO in guiding them through the processes within university. When asking how the KTO was involved, informant 1 first described how the KTO helped him with internal structures of the university. The example he gave was that the KTO knew how to get a project number, which was quite a challenge because many people in university had to approve. He said that the KTO guided him through the university process. Informant 5 said that the KTO helped her with 'who does what' in the university. Informant 6 described how the KTO had connections with the university board, which was helpful because they had to accord with the foundation he

created. Informant 2 was helped in a similar way by an 'enthusiastic' faculty KTO officer. Informant 10 was helped by a colleague of the PR-department in approaching people in the university to get funding: *"...he [PR colleague] also knows people, he also started thinking together about, 'yes, how could you approach that', and 'who could you approach'"*. Lastly, the KTO arranged a letter of recommendation from the Executive Board of the university for informant 3.

For one informant the KTO was involved is business development. Informant 5 mentioned how the KTO officer helped with the approach to her project, and what a business plan could potentially look like.

Two informants (3 and 5) mentioned the KTO's involvement in negotiating with partners outside the academia. Informant 3 was asked to provide information for an exhibition, and the KTO negotiated about the collaboration with the people that organized this exhibition. The KTO officer negotiated with external parties for informant 5 as well.

The KTO was also involved on a more abstract level. After saying how the KTO helped him concretely (with contracts), informant 9 immediately elaborated on the more abstract help the KTO provided him, such as thinking along and exchanging ideas. He also explained that the KTO helped him to stay motivated through their enthusiasm and to get the right mindset. Informant 5 had the same opinion. Informant 3 mentioned that the KTO helped him by making ideas in his project more concrete. He appreciated that the KTO *"Held up a mirror with reality"*. Informant 2 thought the involvement on an abstract level was very important.

Another type of KTO involvement can be described as connecting or boundary-spanning. Informant 7 for example stated the following about the KTO officer: "*And then he again arranges contact with a lawyer through his channels, with whom we then work, and who gives us useful advice. In other words, it helps us with the different possible paths to walk, and also be able to choose. So, and look it is at such a moment that when someone says I don't have that knowledge completely up to date in house, that they can connect us again with someone who can.*" The KTO could bring informant 7 in contact with potential partners in the industry through their networks. Although with a different purpose, informant 3 was also helped by the connecting role of the KTO officer. In his KT project, funding was needed, and the KTO officer searched for funding options at his own initiative.

The type of involvement of the KTO was not a reason for informants 4 and 8 to not consult a KTO. They were both positive about the KTO's involvement in other situations, however they did not miss a KTO in their KT activity. The only help informant 8 could have needed was support in networking (if she would not have had someone that helped with this). Informant 4 said that for the tasks he had to do, he did not need a KTO, but he believed he would need a KTO for different tasks. It thus appears that the type of KT activity can influence the type of KTO involvement.

Proposition 2: the type of KT activity influences the type of KTO involvement.

4.2.2. Degree of involvement

The degree of involvement differed depending on the stage of the KT process. The KTO seems especially involved in the early stages of the KT activity. Informant 7 for example said: "*we notice that they also offer help during the project for problems we run into. So that's very nice. Furthermore, because the project is now running, with the partners, we mainly do it ourselves, we are in the lead ourselves, that's clear, but we can still call on them if we run into problems. And that's happened a few times, and then we ask them for advice.*" Informant 2 indicated that he received a lot of support in the preparation, but he would have wanted more assistance in the actual implementation. Informant 6 said he was supported well by the KTO in setting up a foundation, but afterwards the KTO did not interfere any longer (although asking questions remained possible). This lack of guidance in the project made him feel lonely (especially within the faculty), so he would have liked a more active role of the KTO also later in the project. Informant 9 said that when the KT project is running and everything is sort of set, the role of the KTO decreases; it was then clear that he was in lead. According to the KTO, it is policy to only help the researchers with the start of KT, while in other universities researchers are sometimes helped with the implementation as well.

Several informants expressed how during the KT activity it was always possible to ask questions to the KTO. Informant 9 said it was clear for him that during the project he could call on the KTO if he would run into something (which happened a few times). Similarly, informant 6 said that during the project the KTO was not really involved, but they could ask for help if problems would arise. Informant 7 also stressed this: he appreciated the possibility to ask questions during the project and the quick responses from the KTO.

Five informants (2, 5, 6, 9 and 10) did not perceive the KTO to have a leading role in the process. Informant 2 experienced quite some support from a KTO colleague in the faculty, but he would have liked more guidance in the actual implementation of the project. He would have liked to know how much time some matters take. According to him, the KTO could have helped with this, since the KTO has process knowledge. Informant 5 thought the KTO should take much more control of the process. According to her this would have made the KT process faster and smoother. She explained this by saying how she felt the KT process was messy and complicated. She did not know where she stood in the process, where to pay attention to and how long certain legal aspects would take to be arranged. When asking informant 6 about the degree of the KTO's involvement, he replied that the KTO's involvement in his project was not heavy or intense, especially not after the project was set up. He would have liked a more active role of the KTO also later in the project, for example when he had to contact various departments within the university. When asking informant 9 about the KTO's degree of involvement, he said it was rather reactive than proactive (especially when the project was running). Lastly, informant 10 was helped by two different KTO officers. The first one that helped her was not involved, he came to talk once but did not leave an impression. The KTO officer that was helping her later, was, in contrast, very involved: *"Yes, she is very active. She is, she is really great. Yes she is doing very well. Yes."* This officer however only helped with subsidies for research, so not with KT.

Informants 1, 3 and 7 experienced a (temporary) leading role of the KTO. When asking about the degree of involvement, informant 3 answered that the KTO was without a doubt actively involved. Later on, he said that by times the KTO was very active and by times was '*of course*' busy with other matters. He also said the KTO officer 'had a crucial role' and that the officer really looked at the whole collaboration methodology. The KTO officer that helped informant 1 seemed to be very involved as well. When asking about the degree of the KTO officer's involvement, informant 1 said: "…*he was very much involved. Also because he liked the project, but also because he saw it as a way to really do his job for once*". Informant 7 was also clear on the leading role of the KTO: he appreciated that the KTO took the lead in scheduling appointments, making contacts, writing documents, and discussing those.

Although the KTO was not always actively involved, many informants were positive about an active role of the KTO. Informant 7 would recommend a leading role of a KTO because he thinks the process then goes faster. Informant 10 was also positive about an active role of the

KTO. As mentioned early, informants 2 and 5 missed some guidance from the KTO. When asking informant 8, who did not consult a KTO, whether she would have liked an (active) involvement of the KTO, she said: "*Yes. Yes of course, that saves a lot of time. Look, well, generally I think in Nijmegen that we as scientists have to do a lot ourselves. So I always think, the more support the better, you know.*" She also said that proactive support in financial issues could have been nice, since some issues can be complicated. Informant 9, who experienced a reactive rather than proactive involvement of the KTO, thinks that if the KTO was involved proactively, it would be possible to get more out of KT in terms of social impact (so not for him personally per se). He later specified that he was not sure where the role of the KTO starts and stops. Lastly, even though no negative remarks were made about an active involvement of a KTO, informant 2 putted things into perspective by saying that he believed that in the end, it is always the researcher that is in lead, while the KTO's role remains creating conditions under which KT is possible.

Informants also mentioned what they thought about the role of the researcher and the role of the KTO. Without asking them, informants 2, 5 and 8 defended how scientists should not be concerned with some aspects of KT because it is their role to do research and not to be occupied with the hassle surrounding the KT process. An active role was thus recommended.

4.3 Motivations

All researchers had various motivations for engaging in KT. Some motivations were more important for one researcher than for another. Most of the motivations were shared at least with some of the other researchers. An overview of identified motivations is shown in table 4.

Table 4: Motivations

Infor-mant	Motivation							
	Make knowledge accessible/ useful	Career	Personal visibility	Research	Learning	Enjoyment	Achievement	Financial
1	Yes	Yes				Yes	Yes	
2	Yes	Yes	Yes	Yes			Yes	
3	Yes	Little	Yes	Yes			Yes	
4	Yes	Yes	Yes	Yes				
5	Yes	Yes		Yes		Yes		
6	Yes			Yes				
7	Yes	Yes		Yes				
8	Yes	Yes				Yes	Yes	
9	Yes			Yes	Yes			
10		Yes		Yes				

A first visible theme in the interviews is the motivation to make knowledge accessible and useful outside of the academia. This motivation was present in almost all informants. Three codes led to this theme: the motivation to create value for society, the motivation to make knowledge accessible for a general audience and the motivation to extend the third mission of the university. Informant 6 and 7 regarded creating value as their primary motivation. Informants 2, 4, 6, 7 and 8 saw it as their job as academic to make sure that knowledge is made use of outside of the academia. They were motivated to work on the third mission of the university and saw it as part of their duty as academics. Informant 2 said for example: "*Well, the most important thing is that I personally think that science, but also a position at the university, is something that exists because society sees the value and effort of it. Because yes, the society pays for my position. I mean I'm just paid by Dutch society in fact.*" Lastly, informants 1, 2 and 3 stated that they wanted to make knowledge more accessible. Informant 1 said that his personal conviction for the KT activity was to translate the science of history into something more accessible and enjoyable, visible for everyone. Informant 2 also strongly believed in translating science into something accessible: the purpose of the KT project he started essentially is the translation of knowledge so that society can use it. Informant 3 thought it is a waste that even relatives cannot understand what he was researching.

For eight informants (2, 3, 4, 5, 6, 7, 9 and 10) research was a motivation to engage in KT. Informant 3 was strongly motivated by getting funding for his research group so that their research could be extended. Informant 5 was motivated by the opportunities for collaborations that could lead to the generation of new research question and grants. For informant 7 this was a motivation as well. He hoped the KT activity would trigger new research collaborations. Similarly, informant 9 and 10 started with KT to advance their research. Informant 10 said: "*You just do this because you think, "Wooow, does this data exist? Wooow, this is unique! This, I have to go after this! What can you do with all this?!*" For informant 6, research was a secondary motivation. Informant 1 was not motivated by furthering research because he was leaving the academic world. He noticed that also his companion, who stayed in the academic world, was not primarily motivated by research. Informant 2 said that the new research project that arose because of the KT activity was not anticipated, but more of a 'by-product'.

In eight informants (1, 2, 3, 4, 5, 7, 8 and 10) career related motivations were identified. Informants 1 and 5 said that they engaged in KT because they had the feeling it was going to

deliver them something career-wise. At the time of the start of KT, both were thinking about what they want in their career. Informant 2 felt he needed to engage in KT to get a solid career position in the university. He thought that he did not have a big chance of coming far in the academic world due to his age, so he needed something special to compete with other academics to keep a position at the Radboud University. Informant 3, 4 and 10 also recognized that improving their scientific career was a reason to engage in KT. Besides this, informants 7 and 8 were not motivated to boost their own career, but by the urge to improve the (scientific) career of peers. Informant 7 said that he had no aspiration to work in business instead of the academia, however he liked that with KT he could create career opportunities for his staff. Informant 8 explained that the PhDs in her discipline had difficulties finding a job in university after the PhD and she thought the engagement in KT could deliver them more opportunities. Lastly, informants 2, 3 and 4 acknowledged that gaining more personal visibility could play a role in engaging in KT. This visibility is not necessarily career related.

Another group of motivations that can be identified is that KT is enjoyable or challenging. Informants 1, 2, 5 and 8 all mentioned that they engaged in KT because they enjoy it very much. Additionally, researchers are sometimes motivated by a sense of achievement. Informant 2 said he strongly believed in his research and the success it would deliver. Informants 1 and 3 had a similar motivation; they felt strongly about the possible success and the challenge of the project. Furthermore, informant 8 was really motivated by "*opening the doors of science*" for her discipline. In her discipline, science and collaborations with the university were not common, so she saw possibilities in this. She wanted to 'innovate' and took the opportunity. Furthermore, informant 9 was motivated by learning to build technical applications and software; something that is not part of his normal research work.

Lastly, informant 1 and 4 noticed that they did not engage in KT for financial reasons. The other informants did not mention financial reasons as possible motivation.

For none of the motivations a specific type of KTO involvement appeared to be present. The same applies for motivations and the degree of KTO involvement: when comparing the cases where the researcher perceived an active role of the KTO (1, 3 and 7) and the cases where a rather passive role of the KTO was perceived (2, 5, 6 and 9), to the researchers' motivations, no distinct results show up. Furthermore, no specific motivations for specific KT activities were found. Informants 5, 7 and 9 for example created applications, where the KTO could

assist in legal or administrative matters such as contracts and IP. These informants had different motivations: informant 9 had a relatively strong research motivation, informant 5 and 7 both had career motivations but in a different way and informant 7 had a learning motivation. Furthermore, informants 1, 3, 4, 6 and 8 engaged in an exhibition, but with different motivations. The same applies for the three informants that wrote a book for a general audience, and the informants that engaged in collaborations outside of the academia.

4.4 Perceived benefits of KT

4.4.1 Perceived benefits

Table 5 contains a summary of the perceived benefits of KT by informants. Just as the informants had multiple motivations for engaging in KT, they perceived multiple benefits. Some benefits were perceived by many informants; other benefits were found less frequently.

Table 5: Perceived benefits KT

Infor-mant	Perceived benefits of KT							
	Made knowledge accessible/ useful	Career	Visibility	Research	Learning	Network	Experience in KT for SSHA	Enjoyment
1	Yes	Yes	Yes		Yes	Yes	Yes	
2	Yes	Yes	Yes	Yes	Yes	Yes		Yes
3	Yes	Yes	Yes	Yes				
4	Yes		Yes	Yes	Yes	Yes		
5	Not yet	Yes			Yes			
6	Yes			Yes		Yes		
7	Not yet							
8	Yes	Yes	Yes				Yes	
9	Not yet			Yes	Yes			
10	Yes	Yes		Yes		Yes		

Informant 6 doubted the benefits of KT at some point in the process. He said the following: *"…I also occasionally had, 'yes, why am I still doing this?' And why should I submit an application for this? I can raise research funds, but for me personally I don't get anything from there. Then I bring it in for others. What I just said, for career technically, it is not badly valued, I think. Then they say, 'we all think it is very important', but eh yes… if you want to become a professor or UHD, then other boxes have to be colored, it seems. So in that regard, yeah."* He was thus at some point not sure anymore how KT benefited him. Other informants did not mention these doubts. Most informants however thought that the university does not value KT highly. Benefits could thus increase when the university would value KT more.

Proposition 3: How the university values KT influences the researchers' perception of benefits of KT.

Informants 1, 2, 3, 4, 6, and 8 mentioned as perceived benefit of their KT activity that they made knowledge accessible to and useful for a general audience. Informant 1 missed this in his normal work as PhD and saw it as a benefit of KT that he could make knowledge accessible. Informant 2 was convinced that with his KT project he had contributed to a public debate around a certain topic. He thought the project generated more attention for the topic in society. He believed he successfully 'democratized' information. Informant 4 said that he wanted to make the objects in his exhibitions "sexy" so that the general audience can understand the underlying meaning. Informant 4 thought KT gave him a broader view than purely fundamental research would. When asking informant 3 about perceived personal benefits of KT, he answered that KT made him more aware of the knowledge that he has and the relevance of it for society. He felt that his KT project created value for society, which he believes is essential for the humanities discipline. Informant 9 hoped that his KT projects will have indirect impact on practitioners. Like the projects from informants 5 and 7, the activity is not finished, so it cannot yet be said if it created value for society.

Informants 2, 3, 5 and 8 perceived a positive effect on their career due to KT. For informant 5 it was important that the KT project helped her realize that she wanted to do more with KT. It also led her to a position where she could do more with KT. Informant 8 said that KT helped her with her career; she got a lot of publicity and more status due to the projects. She also had the feeling that after the success of the project, she was taken more seriously (in and outside her discipline). Informant 2 said that KT was a golden opportunity in terms of creating a good career position. He explained that with his age it is difficult to get a solid career position in one university. Informant 1 proudly regarded his KT project as part of his CV (although that was not his intention). Informant 3 saw an improvement in his own scientific career but also in that of his peers; his team became more visible in science. Informant 8 saw as a benefit of KT that some PhDs ended up working at the University of Applied Sciences because of the collaboration she set up as KT activity.

Some informants doubted a positive effect of KT on a scientific career. Informant 1, 4 and 6 mentioned that the university does not highly value KT and thus engaging in KT is not necessarily a good career step. Informant 4 explained that formerly, when someone would

engage in KT it was seen as strange rather than positive; specializing in a research subject was the norm. Likewise, informant 6 thinks KT is badly appreciated from a career point of view.

Informant 1 and 5 valued how the KT project gave them insights into suitable career paths. For informant 1, KT was a confirmation of where he wanted to go with his career. He was interested in education and the project confirmed this interest. Informant 5 enjoyed being occupied with KT so much that she decided to make it her next career step. Due to the KT project she got a position in KT in the research institute she worked.

Five informants mentioned that they perceived an increased visibility as a benefit of KT. Visibility can mean visibility in science or visibility in society. Informants 2, 3, 4 and 8 experienced positive effects on their personal visibility in science. When asking informant 8 about whether she experienced benefits in her career, she said she liked the visibility KT gave her. Informants 1, 2 and 4 saw personal visibility in society as a benefit of KT. Informant 4 said the following: "*…I think you shouldn't cross out, yes, all the great arguments, that vanity can play a role in valorisation. In the sense that you get a certain notoriety. (…) Well, gosh, that's nice, you think about that sometimes, especially if you have pictures. Uh. That form of vanity may also play a role in a number of people, without them saying so*".

Some informants (2, 3, 4, 6 and 9) perceived research related benefits from KT. Informant 2 mentioned a new paper he wrote which was the result of working together with the public in his KT project. When talking more generally about how he thought KT is useful, he said that if done properly it is possible to benefit a lot from KT during research, due to the interaction it can produce. Likewise, informant 4 thought that his KT activities generated benefits for scientific research: "*[one KT project] for example, certainly led me to write a few essays, papers, which I might not have written otherwise. When looking for material for exhibitions and when reading into the profession (…), you come across things. Very often that is the case, also about that (…) exhibition, that was not my super specialism either, but I was able to prepare 1 or 2 further publications and yes, so it pays off in that respect as well.*" Informant 6 also mentioned how KT brought in new projects and made more time for their own research projects: "*if we do a follow-up project, we can attract at least 2, maybe even 3 or 4 new PhD students. And that simply means that we can also expand our own research further.*" Informant 9 revealed that the KT activity delivered rich data, from which new research questions could arise. Lastly, informant 5 indicated that she experienced no research related

benefits because she left her job as a scientist. If she would not have left, the KT activity could have delivered her more research related benefits.

Furthermore, several informants mentioned how they saw learning as a benefit from the KT activities. Informant 5 liked to see how the people outside of the academia worked, because it differed a lot from what she was used to in academia. She thought the collaboration and the whole (KT) process was interesting to see. Informant 1 had a similar experience as informant 5 in this respect. The KT activity gave him more knowledge about aspects that are different from his scientific tasks, such as project organization and communication related tasks. Informant 2 also appreciated he had learned about project organization and about the KT process within the university. Informant 4 did not consult a KTO and had learned KT skills by himself, such as how an exhibition can be made a success. Informant 9 mentioned how he learned that the market is especially interested in the service that is related to his product.

Informants 1 and 2 perceived the expansion of their network as a benefit of KT. Informant 1 thought the network expansion he experienced was useful for his career, since the connections he made were relevant for the work he planned to do after his PhD. Informant 2 said that he still had a network of people he can use to ask questions for KT or research projects. He thought that network expansion is a positive effect from KT, because it is possible to connect with people outside the university circle. Informant 4 did not explicitly mention a network expansion to be a benefit of KT, but he did mention that he enjoyed how he could give advice on exhibitions in other European countries, which is (partly) a result of him engaging in KT activities. Informant 6 also mentioned an increase in his network, although this was more in the context of increasing opportunities for research funding. Informant 10 experienced a useful network for research due to her KT project. Informant 2 suggested that the KTO should set up a course in networking: "*Because you can only do such a project if you build networks with other organizations in the Netherlands. (…) Yes how do you keep them together, how do you find them. Erm. How do you get them committed to some activities?*"

Another named benefit of KT was that every KT activity delivers more experience and thus makes it easier for other SSHA researchers to engage in KT. Informant 1 said the following about the KTO officer that helped him: "*I think a lot of things that we've encountered with the project now, he will know in the future, and also knows how to deal with it then.*" Similarly,

informant 8 noticed that she had troubles in the KT process because she was 'pioneering', but she had the feeling that it made more possible in KT.

Lastly, Informant 2 stressed that maybe the most important thing for him was that he really enjoyed engaging in KT and interacting with people.

When comparing the motivations of researchers to engage in KT with the perceived benefits of KT, it can be seen that often the benefit is similar to the motivation, and sometimes different. For example, increasing visibility was identified as motivation in three informants, while it was identified as perceived benefit in five informants. Only one informant saw learning as a motivation, while five informants perceived learning as a benefit of KT. Career and research on the other hand were found more often as motivation than as a benefit. Nine informants were motivated by making knowledge accessible to and useful for a general audience, and ten informants perceived this as a benefit. These results suggest the following:

Proposition 4: the researchers' motivation to engage in KT influences their perceived benefits of KT.

4.4.2. Influence of type and degree of KTO involvement

The above-mentioned perceived benefits do not seem to be related to specific types of KTO involvement. The interviews do however show that various types of KTO involvement could help the informants to create benefits from KT. When asking the informants directly whether the involvement of the KTO helped them to get benefits from KT, informant 5 responded that the KTO could have made it possible for her to experience more benefits from KT if they would have asked her more process questions. These questions could have helped her look reflexively to the process and think about what she wants to learn and get from it. That did not happen, she said; she was only occupied with finding out who to contact. Informant 9 answered that the KTO helped to create benefits for him in the sense of creating the right mindset and knowing how to raise funds. Furthermore, informant 7 also indicated that the KTO's role in networking delivered benefits for him: "*In this we see that we really benefit from Radboud Innovation.*"

More indication for a relation between type of KTO involvement and perceived benefits can be found in the remarks of informants on how much they valued the KTO's involvement. Informant 1 for example thought the involvement in fundraising was 'super

valuable', informant 2 valued the involvement in crowdfunding and informant 3 thought the involvement (in fundraising, negotiating, and helping to keep a critical view on some things) was 'essential' and said often 'thanks to the KTO officer'. These comments suggest that the KTO's involvement helped the researchers with the KT process. If the KT process goes smoothly, this eventually helps the researchers with getting benefits from KT. When the KTO takes on the more practical matters of KT, more time is left for the researchers to be occupied with the content, as informant 10 also notices.

Some comments of the researchers on what they missed in the KT process also imply that the KTO's involvement could help them get benefits from KT. For example, informant 6 noticed how he would have wanted more visibility and how the KTO could arrange this by for example organizing network events. If the KTO would have assisted in creating more visibility for informant 6, he would have perceived visibility as a benefit of KT instead of feeling like he was the only one who engaged in KT.

A comparison with the cases 4 and 8 also shows that various types of KTO involvement can lead to perceived benefits of KT by researchers. Informant 4 said that in his projects he would not have benefited from a KTO's involvement, but he thought that he might have benefited if he would have engaged in other KT activities (such as patenting and making education material) or if he would have needed funding (supporting proposition 2). Informant 8 said *"...you know, how can they help me personally? yeah, I already have a good tenure."* She would not have benefited from the KTO, except for assistance in networking, she said.

Everything considered, it seems that when the KTO adjusts its involvement to the needs of the researcher, the researcher could experience more benefits.

Proposition 5: The type of involvement of a KTO influences the researchers' perception of benefits of KT.

The degree of involvement of the KTO differed per informant. In the interviews it was asked directly whether the involvement of the KTO had helped the researcher to get benefits from KT. Informant 3 answered that the role of the KTO was essential and noted that he could have prevented a failed KT project when he would have involved the KTO earlier. Informant 6 responded that within the university, the KTO officer felt like an advocate, a lawyer, or a manager for him, that could translate in the language of the university. He also thought that when he would have had more support, especially within the faculty, he would have gotten more benefits from KT. Without the support he sometimes questioned why he was engaging

in KT because he did not feel it delivered benefits for himself. These two answers show that the degree of involvement of the KTO might influence the perceived benefits of KT.

All informants seemed positive about an active role of the KTO in the KT process. Informant 5, 7 and 8 mentioned how it would make the process go faster if the KTO took more control. What almost every researcher missed, was the time and space to do KT activities. Only informant 4 felt that he received time and space to do KT activities from the university. An active degree of involvement was thus preferred by the researchers. Furthermore, it was found that early involvement can prevent failure of the project and that a continuing involvement of the KTO during the project was perceived as helpful.

In several informants, the need for more guidance in the KT process was identified. Informant 2 would have liked to know how much time some things would take; aspects that require, according to him, process knowledge; which he did not have but the KTO did. Informant 5 explained how she regarded the KT process as messy and complicated: she did not know where she stood in the process, which made the KT process feel complicated. She did not know for example where she should pay attention to and how long it would take before certain legal aspects were arranged. She was not guided in finding the right expert. She clarified this feeling through a metaphor: she had the feeling that the assistance in KT in the university was more like a walking buffet, while she would have wanted to be in a restaurant: she had to look for everything herself, while more guidance would have made everything go faster and smoother. Considering all these remarks, the following proposition can be made:

Proposition 6: The degree of involvement of a KTO influences the researchers' perception of benefits of KT.

4.5 KTO quality

Overall, informants were content with the quality of the KTO that was involved in KT. Informants gave several remarks on what exactly they appreciated from the KTO officers. Various positive remarks on the role of the KTO in the KT activities were made. Many informants used the word 'valuable' to describe the services of the KTO. Informant 1 said that it is 'super valuable' that the KTO officer knew his way in fundraising. He also thought it was valuable that he knew what roads to take to convince the university or the government. Informant 2 said the KTO's involvement was valuable because of the experience they had in crowdfunding. He thought the value of the KTO was that you do not have to reinvent the

wheel. He also appreciated the (process) expertise of the KTO. According to him, researchers need help to get going, to shape the idea and to make themselves visible, and the KTO could assist in that. Informant 3 valued that the KTO officer negotiated for him. He also thought the KTO was skillful in fundraising and helping to keep a critical view. He called the role of the KTO 'essential' and mentioned quite often 'thanks to the KTO officer". Informant 6 valued the involvement of the KTO officer as well: "*Yes I really had the feeling, I think that with him I didn't have the feeling that I was swimming…without I knew there was a ball, or a buoy*", and "*what I valued, was the moment that with organizing and laying the foundation, I had the feeling I didn't stand alone, I had someone with me that was on the same page.*"

Several informants spoke about the expertise of the KTO officers. Informant 5 believed the KTO officers are professionals. Informant 6 also considered the quality of the KTO officers as very good. He was however less positive about the quality of the other departments within the university that he needed to contact in het KT process. Informant 9 thought the KTO officer had an eye for certain aspects and a good focus. He would come back for other projects. Informant 7 was also positive about the competence of the KTO officers. When asking whether he was content with the KTO quality, he said: "*Yes. Yes. Definitely, like I said, (…) [KTO Officers], that was a brilliant team together*". Informant 10 thought the person from PR and one KTO officer were competent, however she considered another KTO officer as not competent and not a professional in KT.

Some informants stated that they appreciated the commitment, involvement, and enthusiasm of the KTO officer. Informant 1 said that the KTO officer was passionate about the project quite quickly and became part of the team. He thought the project could not have succeeded within the university without him. Informant 9 valued the positive energy and enthusiasm of the KTO officer: "*I also find eh, more abstract, I think she is a very positive energetic woman haha. But also who gives motivation, who helps you to keep going (…). A pleasant person to ask for things as well. And it is actually a pleasure to spar with her, but where also positive energy comes from.*" Informant 10 missed involvement of one KTO officer but appreciated the involvement of the other KTO officer that helped her with subsidies for research.

Informants 3 and 9 mentioned the personal relation with the KTO officer. Informant 3 thought the KTO helped in creating a successful project; "*he knows my knowledge, he knows my ambitions, and willingness to cooperate.*" Informant 9 thought the personal relation with the

KTO officer had an advantage and disadvantage. He had a good connection with the KTO officer: *"[the KTO officer] also knows what I did, you see. There is also some history. But I also know, she can help me."* One of the first persons he contacted when his KT activity was set up, was the KTO officer. However, he believed this connection also brings vulnerability: if the officer leaves, he said, then it disappears altogether, and you have to rebuild it from scratch. He would not know what someone else could do for him. According to him, this is the danger of connections within the university; many connections are based on coincidences.

Taken together, almost all researchers were content about the KTO's quality. Informants 5, 6, 7 and 9 explicitly said how competent they thought the KTO was. The informants mentioned different aspects of the KTO's quality. Informant 1 named how committed the KTO officer was to his tasks. Informant 9 mentioned the positive energy and enthusiasm. Some informants described a personal connection with the KTO officer. Only informant 10 was not content with the KTO's quality. She was positive about the quality of one KTO officer, however she thought the other KTO officer did not leave an impression and did not have competence. This other KTO officer was not really involved. She would have appreciated more assistance in fundraising. While this observation seems different from the rest of the cases, some similarity can be found. What several informants noticed, was how some guidance from the KTO was missed in the process. A reason that informant 10 did not appreciate the KTO officer was because he was not truly involved. In this sense, the observation is in line with the other cases where some guidance from the KTO was missed. Process guidance is quite an abstract concept. The capability to lead a researcher through the process could be related to the perceived quality of the KTO; apparently it is essential for researchers to get assistance in the process, which they did not always receive. Therefore, proposition 7 emerges:

Proposition 7: The researchers' perception of quality of a KTO affects how the involvement of a KTO influences the researchers' perception of benefits of KT.

4.6 KTO and motivations

When asking how the KTO officer helped to achieve the goals of the researcher in KT, informant 9 answered the following: *"…I think my drive, to really do better research (…) colleagues pointed out to me 'what you are building now, can have a social impact'. That got me thinking, yeah okay I can do that. And eh (…) [the KTO officer] helped me, okay if you*

want that, how can you realize that. (...) so it's not just what she has done in concrete terms, of course she did help concretely with those contracts, but also a lot with that mindset...'' It became clear in the interview that the KTO officer changed the mindset of informant 9 towards having more social impact. In this sense, the KTO has thus changed the motivation for future KT activities that informant 9 would engage in.

It also became clear that this change in motivation could happen because the informant believed in the KTO's quality. He said the following about the KTO officer that helped him: "*And then I think, if I would engage in KT again, I'll come back after a few years. So even if I'm not working on software but on other research projects, I think hey, she's got an eye for it. So uh. Yes. So that's kind of the drive I just talked about. That focus of her yes.*" Informant 5 noticed after the interview that she really identified with these statements: "*This was one hundred percent true for me as well*". The researchers' perception of quality of a KTO could thus potentially influence how the involvement of a KTO affects researchers' motivation to engage in KT. In the example above the informant's motivation changed because of the perceived high quality of the KTO. Based on this, the following propositions can be made:

Proposition 8: The type of involvement of a KTO affects the researchers' motivation to engage in KT.

Proposition 9: The researchers' perception of quality of a KTO affects how the type of involvement of a KTO affects their motivation to engage in KT.

4.7 Proposed conceptual model

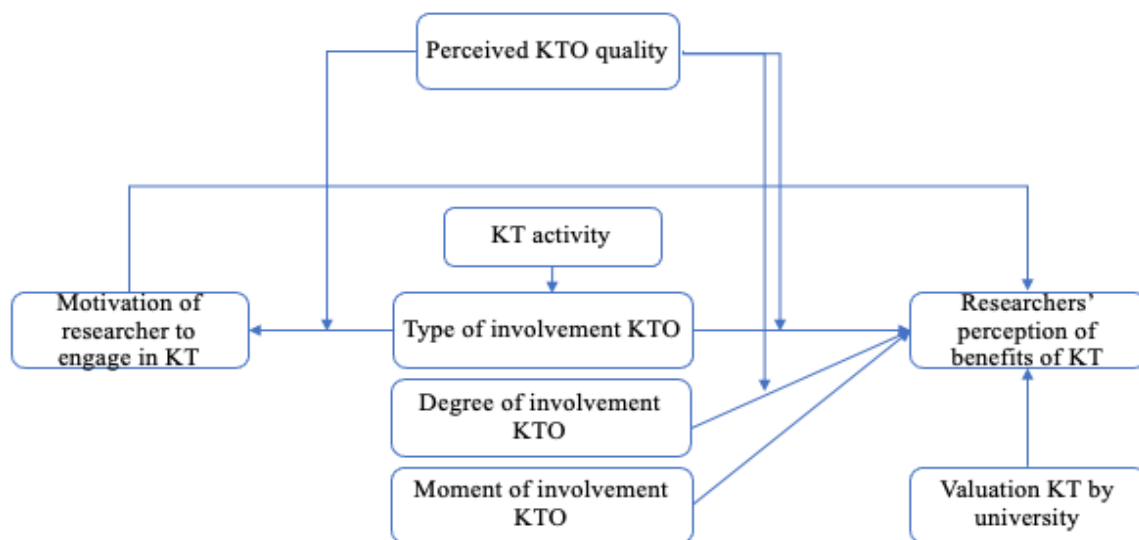The propositions are illustrated in the proposed conceptual model in Figure 2.

***Figure 2**: proposed conceptual model*

5. Discussion

In this chapter the results of this study are discussed. First, a conclusion is drawn. Then, the meaning of the findings is explored, after which the contributions to the existing literature are addressed. Next to this, the limitations of this research are discussed, and some future research avenues are proposed. The chapter finishes with some managerial implications.

5.1 Conclusion

The aim of this research was to find out how a KTO can be of benefit to SSHA researchers engaging in KT. The study has therefore focused on the following question: *What determines the perceived benefits of a KTO for SSHA-researchers when engaging in KT?* In this qualitative multiple case study, ten SSHA researchers from the Radboud University were interviewed, of which eight had consulted a KTO. Nine propositions were made based on the results. This study demonstrates that the type, moment, and degree of a KTO's involvement, the perceived KTO quality, the KT activity and the valuation of KT by the university can influence the researchers' perception of benefits of a KTO when engaging in KT. Moreover, this study has found various useful indicators of researchers' perception of benefits of KT, the type and degree of KTO's involvement and the perceived KTO quality.

The researchers in this study participated in various KT activities and the KTO was involved in several ways and degrees. The findings imply a relation between the type of KT activity and the type of the KTO's involvement. The KTO was involved in legal, financial, and administrative matters, in guiding the researcher through the university process, in business development, in negotiation, in boundary-spanning and on a more abstract level. The degree of involvement varied from proactive to reactive and differed per stage of the KT process.

Every researcher had several motivations to engage in KT. Pro-social, research, and career related motivations were found the most. The motivations were not related to certain KT activities or to the type and degree of KTO involvement. It was however discovered that the KTO can influence the researchers' motivation to engage in KT. Furthermore, it was found that the researchers perceived many benefits of KT that were similar to their motivations, and several benefits that were different from their original motivations.

The findings suggest that the type, degree, and moment of the KTO's involvement can influence the researchers' perception of benefits of KT. Several types of involvement, ranging

from legal support to helping researchers look reflexively to the process, seem to generate perceived benefits of KT. Remarkable was how informants valued an abstract type of support. Regarding the degree of involvement, all informants seemed positive about a KTO taking the lead. It was found that with a proactive involvement the KTO could help informants create more benefits from KT. Noteworthy was the need for more process-oriented questions and support. The informants that did not consult a KTO did not miss the KTO's involvement but were positive about a proactive role of a KTO in KT processes. Lastly, the results suggest that how the university values KT can influence the researchers' perception of benefits of KT.

The researchers' perception of KTO quality could have a moderation effect on the relation between the type and degree of involvement of a KTO and the researchers' perception of benefits of KT. Another possible moderation effect of KTO quality was found for the relation between the type of KTO involvement and the researchers' motivation to engage in KT. Except for one researcher (partly), every researcher perceived the KTO's quality as positive. Recurring aspects of KTO quality were the commitment, enthusiasm, and personal relation with the KTO officer. Several researchers missed some guidance in the KT process. It may be argued that this absence of involvement is part of the perceived KTO quality.

5.2 Theoretical implications

5.2.1. Discussion of findings

It was found that the researchers quite often were involved in popularization activities, such as publications of articles or books, participation in short movies, interviews and tv programs. This is in line with a study that implied that SSH researchers are likely to engage in popularization activities (Olmos-Peñuela et al., 2013a).

The informants in this study were often (primarily) motivated to engage in KT by the urge of contributing to society. This often-encountered pro-social motivation (Iorio et al., 2017) builds on the existing evidence that SSH researchers believe KT is important (Wutti & Hayden, 2017). The results show that no informants engaged in KT because of financial reasons, and many engaged because of research-related reasons, such as getting new research insights and funding (Hughes et al., 2016; Ankrah et al., 2013). This corresponds with previous research that found that academics are more likely to be motivated by research than by commercialization (Lam, 2011; d'Este & Perkmann, 2011). Since researchers with

research-related motivations more often engage in collaboration-based activities (d'Este & Perkmann, 2011), and informants engaged in such activities, findings are consistent with the literature. A commercialization motivation could occur more in spin-off activities, consulting, and patenting (d'Este & Perkmann, 2011); activities where informants were not involved in.

Interesting to see was how some informants were motivated to engage in KT by an affective duty, as suggested by previous literature (Huyghe & Knockaert, 2015; Abreu & Grinevich, 2014). The affective duty was found in the informants that mentioned how they were motivated to create career opportunities for peers. The motivation to get more visible in academia or to be praised (Iorio et al., 2017) and the motivation to get more career options or a better career position (Tartari, Perkmann, & Salter, 2014), was also found in the interviews.

Only one researcher clearly seemed motivated by learning, while several researchers saw learning as a benefit of KT. Although learning can be perceived as a research-related motivation (D'Este & Perkmann, 2011), the results suggest that learning is not always research-related. Furthermore, some informants seemed to be motivated by the sense of achievement on itself, so not per se related to research or career for example.

The findings indicate that most researchers perceive the assistance of a KTO as valuable when engaging in KT. Not consulting a KTO could cost researchers more time and effort and make it harder to navigate through the complexity of the university. This is in line with a study that found that researchers can have limited time, interest, social networks, credibility, financial means, reliable contacts, and experience and therefore consult a TTO (Göktepe-Hulten, 2010). The results imply that when a KTO would support the KT process actively while adapting to the researchers' needs, the KT process would go smoother, and the researcher would be left with more time. This is consistent with the theory that adapting to the needs of the researcher enhances the researchers' involvement in commercialization (Derrick, 2015).

The type of KTO involvement was operationalized in various ways due to the variety of literature on KTO tasks and capabilities. The results suggest corresponding types of involvement, varying from concrete support with the university process, negotiating, business development, boundary-spanning, legal, administrative, and financial support, to more abstract support such as mirroring and thinking along with the researcher. These types of involvement are useful indicators. Assistance depended on the activity and the specific needs of each case. Remarkable was how researchers perceived the process guidance as valuable. The bird's-eye view of the KTO prevented researchers to lose sight of the overall picture.

Results suggest that degree of involvement can be measured as reactive or proactive, or as a leading and non-leading stance. It was found that the KTO was especially involved in the early stages of KT. A plausible explanation for this could be that in the first stages of KT a lot needs to be done in the organization of the project. The KTO was less proactively involved when the project was running. All researchers seemed to be positive about a proactive role of the KTO, and several thought they would have benefited from a more proactive role.

Several explanations are possible for the two informants that did not consult the KTO and did not miss the KTO. Results suggest that the type of activity, personal preferences, or capabilities of the researcher could influence the need for a KTO's (active) involvement. The age of these two informants could have played a role as well, since the KTO in SSHA is only a phenomenon of recent years, while these professors had begun with KT many years ago. They could have learned the relevant skills on their own and once they learned the skills, they did not need a KTO anymore, or at least less than the other researchers. This correlates with the theory that when a researcher is experienced and has a consolidated career, KTO quality does not play a role in patenting activities (Olaya-Escobar et al., 2020). Potentially it is not per se the KTO quality but the KTO involvement in itself that is relevant.

The findings show that the researchers were often content about the quality of the KTO. Positive aspects of the KTO that were found included commitment, positive energy, enthusiasm, and personal connection. KTO quality was operationalized in reliability, infrastructure, and staff quality, based on a study in a STEM oriented university (Olaya-Escobar et al., 2020). Some indicators of reliability such as dedicating necessary resources and some indicators of staff quality such as empathy and sensitivity could be recognized in this study. Infrastructure however was not mentioned by the informants. Remarkable was especially how the degree of involvement of a KTO seems to play a crucial role in their appreciation of the KTO. This indicates that degree of support could be an indicator for the researchers' perception of KTO quality, together with reliability, empathy, and sensitivity.

The results suggest that KTO quality could play a role in how the involvement of a KTO influences the perceived benefits of KT (proposition 7). One informant who had a consolidated career was not content with the KTO. Therefore, KTO quality could play a role in KT activities, even when the researcher has a consolidated career. This contrasts with the theory that KTO quality does not play a role in patenting activities when the researcher is experienced and has a consolidated career (Olaya-Escobar et al., 2020). It however resembles

the finding that an experienced researcher with a consolidated career possibly has less need for a KTO.

5.2.2. Implications of findings

Previous studies on SSHA researchers engaging in KT are scarce (Olmos-Peñuela et al., 2014). Moreover, studies have focused on the role of a KTO in patenting and relatively little on the role in supporting non-commercialization practices (Zhou & Tang, 2020; Holgersson & Aaboen, 2019); while these are common in SSHA disciplines. This study therefore adds to this gap in the literature, by providing some insights in SSHA researchers engaging in KT and the role of the KTO in this. More specifically, it helps to understand the process of KTO involvement when the KTO assists both STEM and SSHA researchers.

This study provides new information on the types of KTO involvement with SSHA researchers that engage in KT activities. Some research existed regarding the role of a KTO in KT. Recognized KTO capabilities are for example boundary spanning (Weckowska, 2014), identifying and acting on opportunities in research and industry (Stemberkova et al., 2020), recognizing useful research outputs, assessing inventions, and identifying partners, licensees, and investors (Weckowska, 2014), and IP, business development and research support. The results highlighted the importance of a KTO's support in the university process, negotiating, business development, boundary-spanning, and legal, administrative, and financial matters, and support in a more abstract way such as mirroring and thinking along. These support types are useful indicators for determining the type of KTO involvement. This study also adds to literature by substantiating that the type of KT activity could influence the type of KTO involvement.

No theory on degree of involvement of the KTO existed. The explorative results suggest that degree of involvement could be measured as reactive or proactive. Researchers were positive about a proactive involvement. Another possible indicator would be a (non)-leading stance.

Prior research has widely investigated motivations of researchers to engage in KT (Perkmann et al., 2021). Motivations of SSHA researchers were however scarcely studied. This study confirms the expectation that SSHA researchers are motivated by contributing to society and by career and research-related reasons, while not being motivated by financial reasons.

Another interesting contribution is that the KTO potentially can have an influence on the researchers' motivation to engage in KT.

Furthermore, this research contributes to existing literature by giving insight into researchers' perceived benefits of KT. While studies have investigated motivations of researchers to engage in KT, no studies considered the benefits that researchers perceive from KT. Some scholars examined the KTO effectiveness (Pinto & Fernández-Esquinas, 2016), however not from the researcher's side. As the researcher is a key factor in KT, adopting the view from the researcher is important. The results show that researchers can appreciate various outcomes of KT that they both had and had not anticipated on.

Since no previous studies focused on the researchers' perception of benefits of KT, also no prior evidence exists on the relation between the involvement of a KTO and the researchers' perception of benefits of KT. This research provides a better understanding of how the involvement of a KTO can influence the researchers' perception of benefits of KT. Studies on researchers (not) consulting a KTO often did not focus on the view of the (SSHA) researcher. Findings of this study imply that the involvement of a KTO can provide the researcher with benefits, but that the need for involvement can differ. Two cases suggest that the KTO does not necessarily need to be involved for the researcher. Other cases also indicated that assistance can be useful when the researcher does not have the time or capabilities to get as many benefits from KT as possible. It was also found that the moment of involvement can be important in creating benefits of KT. Whether researchers benefit from KTO's involvement is possibly thus dependent on many factors, such as the KT activity, the characteristics and experience of the researcher, the type, degree and moment of involvement and the perceived quality of a KTO. Future studies should thus incorporate these factors when studying perceived benefits of KT.

This study also contributes to the literature on perceived quality of a KTO. One study investigated the perceived service quality of TTOs (Olaya-Escobar et al., 2020), operationalizing service quality as the reliability of the service, the infrastructure of the TTO and the quality of the staff. This research provides new information on relevant aspects that can determine the perceived quality of a KTO.

5.3 Limitations & future research

This study has several limitations. Firstly, the findings are explorative of nature, so more qualitative and quantitative research needs to be done. The propositions that were made in this study are a first attempt to understand more about what determines the perceived benefits of a KTO for SSHA-researchers when engaging in KT. The proposed conceptual model and the indicators of the concepts can be used to study the concepts in further detail and to eventually test the relations between the concepts.

Furthermore, the conceptual model did not consider the individual factors of the researchers, such as previous experience, capabilities, and personality. Some signs were found that individual factors can play a role in how the researchers perceive benefits from KT, what kind of motivations they have and how the involvement of a KTO can play a role in this. Future research could therefore include these factors when studying motivations for engaging in KT, perceived benefits of KT and the involvement of a KTO.

Some limitations exist regarding the selected informants. Informants were chosen based on a selection made by the KTO officers in the Radboud University. Some bias could exist in the choice of informants. The selection existed of SSHA researchers who engaged in KT and did or did not consult a KTO. It might be interesting to also study researchers that did not (yet) engage in KT. Potentially these researchers would be more motivated by research than by contributing to society than the researchers from this study were. It would thus be interesting to research whether a link exists between the amount of engagement in KT and the motivation of a researcher to engage in KT. This study would then build on the theory that researchers with a higher degree of pro-social motivation also engage more often in academic entrepreneurship (Iorio et al., 2017) and other KT activities (Ramos-Vielba et al., 2015).

Informants were helped by a few KTO officers. If one of the KTO officers was highly competent and this KTO officer helped most informants, it is likely that the KTO quality is perceived positively by the informants. Consequently, the transferability of the results regarding the perceived KTO quality might be affected. Another point of attention is that informants might have been unwilling to express themselves negatively about the KTO officers, since this is sensitive information. This was partially prevented by reassuring the informants that the results would be anonymized.

Some limitations regarding the studied disciplines are in place. Due to the size of this study, not all SSHA disciplines are represented in the results. Research could gather data from more disciplines within the SSHA and compare the results, to get an understanding of differences between SSHA disciplines and what factors contribute to the perceived benefits of a KTO.

Another future research avenue would be to compare disciplines within the SSHA to for example STEM disciplines. One study suggested that only marginal differences exist between the motivations of researchers from SSHA and researchers from other disciplines (Hayden et al., 2018). Another study implied that SSHA research groups were less motivated by accessing financial resources than research groups in the health faculty (Ramos-Vielba et al., 2015). Further studies are necessary in this area.

Moreover, research could attempt to map the type of KT activities SSHA researchers engage in. It might be harder for a KTO to capture and quantify KT processes in SSHA research (Castro-Martínez et al., 2011; Olmos-Peñuela et al., 2013b). Future research could explore the type of KT activities that are common in SSHA research. Although some insight is provided in this study regarding the KT activities, more understanding of the KT process in SSHA is needed.

Future research could investigate KT processes of SSHA researchers in different universities. The results show that the KTO was especially involved in the early stage of KT activities. An explanation for this is that the policy of Radboud Innovation is to help with the start of KT activities but not with the implementation. Some universities however do this differently.

Lastly, more insights on KTO quality are needed. This research already provides some new information on the perception of researchers on KTO quality, however more qualitative and quantitative studies are required in this area.

5.4 Managerial recommendations

The results of this study can be helpful for various parties that are involved in KT processes: universities, KTOs, public or private research institutes and companies. Results suggest that most researchers see the role of a KTO as essential to succeed. Several informants indicated that without the involvement of the KTO, their project would not have succeeded. This research sheds light on the needs and challenges of the researcher and the process of KT from the researchers' side.

KTOs (and other practitioners) could use the insights of this study and adjust their type and degree of involvement in the researchers' KT process accordingly. Results suggest that adapting to the needs of the researcher can eventually improve the researchers' perception of benefits of KT. The findings show that researchers were positive about more guidance in their KT activities, especially guidance in the process. Time and the complexity of the university organization often came in the way of the researcher. The KTO could attempt to overcome or diminish these issues. More guidance in the process would be helpful, but measures such as clearer guidelines on the process could be helpful as well. Although comparative research with other universities is still needed, KTOs could try to adapt their policy by also assisting the researcher in the implementation of the KT project.

Another idea for KTOs would be to set up a KT network for SSHA researchers. This was suggested by one of the informants. A network would create more visibility of KT which improves the perceived benefits of KT. It could also stimulate knowledge exchange between SSHA researchers, which could be beneficial for a smooth KT process.

Moreover, this study helps practitioners to understand when they are useful to researchers in SSHA and when this is different from when they are useful to researchers in STEM. Possibly the capabilities that are needed are different. The results help to make an informed decision on what is important for staff of the KTO. Some researchers indicated that they valued how the KTO officers work in different disciplines, because this makes them proficient in multiple areas. Informants also saw a risk in this; it should be prevented that the staff looks at the KT process in SSHA with a STEM point of view.

Ultimately and most importantly, this study provides KTOs with knowledge about what determines SSHA researchers' perception about the added value of consulting a KTO when engaging in KT.

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Appendix 1: interview questions

- Introductie
- Kort uitleggen waar onderzoek over gaat

KT activity

1. Kan je me kort vertellen over het kennisoverdrachtsproject, waar ben je mee bezig precies/wat houdt het project precies in?

Motivation

2. Wat is voor jou de reden geweest om aan kennisoverdracht te doen?
- Eerst open vraag.
- Dan de 6 motivaties aan hem voorleggen en vragen in welke hij zich herkent:
    - Onderzoek financiering,
    - leren/nieuwe inzichten,
    - materialen/data/benodigdheden,
    - inkomsten,
    - carrière gerelateerd: erkenning, publicaties, prijzen, cv, beloningen, promotie perspectief, affectief, kwaliteit onderzoek
    - missie-motivatie: toepassen onderzoek, universiteit missie, bevindingen/uitvinding delen, lokale ontwikkeling promoten, reputatie van onderzoek verbeteren

3. Heeft jouw motivatie om met KT te starten invloed gehad op hoe jij de KTO hebt betrokken? Hoe intensief en waarmee de KTO heeft geholpen?

Benefits

4. Is het traject succesvol in jouw ogen? (Komt traject overeen met je verwachtingen?)
- Evt. vergelijking van de 6 motivaties.

5. Wat heeft de valorisatie uiteindelijk opgeleverd voor jou?

6. Heeft de intensiteit van KTO begeleiding daarmee geholpen?
Heeft het type betrokkenheid geholpen?

KTO

Uitleg over KTO en hoe dit zit bij de Radboud. Vragen of iemand anders geholpen heeft naast of in plaats van de KTO.

7. Heb je een KTO geraadpleegd en zo ja wanneer?
8. Waarom heb je wel of niet een KTO geraadpleegd?

Type involvement KTO

9. Waarmee heeft de KTO jou precies geholpen? (IP/Research/Spinoff)

10. Wat vond je daarvan? (Hielp het, waarom?)

Degree involvement KTO
11. Hoe intensief heeft de KTO jou begeleidt, hoe betrokken was de KTO?
- Evt specificeren: slechts advies gegeven/actief betrokken/jou door je project heen geleid
- Wat vond je daarvan? Hielp het om voordelen uit KT te halen?

Service quality KTO
12. Wat vind je van de kwaliteit van de dienstverlening van de KTO?
- betrouwbaar: flexibel, hebben de benodigde middelen en zetten die in
- infrastructuur: faciliteiten zijn aantrekkelijk, grootte van KTO is voldoende
- personeel kwaliteit: ervaring, staan klaar om te helpen, afspraken nakomen, empathie en hulp

13. Wat heb jij gemist in het proces/had jij fijn gevonden dat het KTO mee hielp?

14. Heeft de KTO (of die andere persoon) bijgedragen aan hoe goed het project is geslaagd?

15. Denk je dat als jij de KTO medewerkers zag als super kwalitatief goed, zou hun hulp (intensiteit/type) dan jou meer hebben geholpen om voordelen te krijgen uit het project?