The Effect of Technology Readiness on Individual Absorptive Capacity for Knowledge Transfer

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Abstract

Recipient’s Absorptive Capacity (ACAP) remains an under-researched barrier to knowledge transfer in organisations. The Technology Readiness (TR) dimensions appear to align with individual ACAP as it measures an individual's propensity to use technology. Hence, this research-in-progress discusses that the TR dimensions correlate to individual ACAP. As universities are centres of knowledge generation and its transfer, they are an ideal context for this research. Accordingly, a conceptual framework is developed that serves as a basis for deriving knowledge transfer, aimed at achieving individuals technology absorptive capacity.

Keywords: Knowledge, pedagogy, technology, Technology Readiness, Individual Absorptive Capacity

1. Introduction

Knowledge is important and critical for organisational success [8], [10], [18], [25]. Individual Absorption CAPacity (ACAP) is a barrier to knowledge transfer in the organisation [34], and it is under-researched [22, 23]. Technology enables the transformation of content and pedagogy [19], enhance learning [1], [13], and it has helped students beyond their education [3]. As the Technology Readiness (TR) dimensions are individually focused [20], it aligns well with the subjective nature of tacit knowledge.

The purpose of this research-in-progress paper is to discuss the impact of technology on individual's learning capability. In particular, we will address the following research question, what is the causal effect of TR dimensions on individual ACAP? This study aims to provide empirical results to confirm that the TR dimensions affect individual ACAP. Research conducted in classrooms yielded more relevant results [33]. Hence, universities are the ideal setting as they are dedicated to knowledge generation and its transfer. However, the application for this research goes beyond education, so its significance would be greater than its context, which is universities. Its results could benefit knowledge workers in many ways. It could be used to develop tools such as categorisation for students similar to the TR taxonomy. This would provide further support to pedagogues when transitioning from traditional teaching methods to methods involving technology. The results could further guide the development of technologies in the area of education and user experience. This research would provide further literature in the area of individual ACAP and be useful for future research.

The research-in-progress paper is organized as follows. First, in Section 2, this paper
will lay the foundation for knowledge and its importance in the organisation. Then, it will explain how knowledge is used in organisations, its common barrier in organisations and the solutions that have been discovered. Section 3 presents a theoretical background and hypotheses development. Finally, Section 4 presents the research method and future work.

2. Literature Review

2.1. Understanding Knowledge and its Transfer Process

Davenport and Prusak [6] defined data, information and knowledge as to when data has meaning, it is information, and when information has been experienced, it is knowledge [8], [18]. Knowledge is a mix of various factors that are not clearly defined [6]. However, experience does help develop knowledge [6]. Knowledge transfer is a communication process [39]. Alas, when organisations attempt to manage or transfer knowledge, they neglect the recipient’s perspective and their previous experiences and ignore the tacit portion of knowledge [1, 2]. Knowledge has an undefinable portion called tacit [28, 29]. Tacit knowledge is hard to encode as it is personal and difficult to formalise; this makes it more difficult to transfer [10], [29]. Examples of tacit knowledge would be riding a bike or intuition. This tacit portion of knowledge can be subject to misinterpretation or dispute [2].

2.2. Organisations Methods to Manage Knowledge

Among the many methods an organisation can use to manage their knowledge, some try to absorb knowledge and technology from external sources [9]. Absorbing external knowledge and technology is respectively referred to as ACAP and technology ACAP. One method for organisations to manage knowledge is to implement a Knowledge Management System (KMS) [18], [39]. However, these methods are often ineffective as organisations treat knowledge as if it was some stock [8]. Managers believe that Information Technologies (IT) can be used to enable transfer through communication while ignoring the tacit portion of knowledge [2]. Knowledge is not simply data on a repository [4], [10]. Knowledge is only valuable when it is needed and accessible [18]. Therefore, knowledge is time and cost sensitive in organisations [8], [39]. Ultimately, when a project ends, the resources are scattered along with the knowledge [18], [30]. Knowledge management and transfer require organisations full commitment from the start in order to succeed [8], [10], [16], [18], [21], [23], [30], [38].

2.3. Barriers to Knowledge Transfer in Organisations

Even if organisations fully commit to knowledge management, barriers to knowledge transfer can still exist [34]. In organisations, these barriers are causal (not casual) ambiguity, the rapport between knowledge holder and recipient, and recipient's ACAP [34]. Horizontal organisational structures appear to be an effective solution to causal ambiguity, and rapport between knowledge holder and recipient [18], [36], [38]. These structures differ from the traditional vertical hierarchy as they enable cross-function communication flows [10]. Recipient’s ACAP remains as a barrier that is under-researched [22, 23]. Cohen and Levinthal [4] argue that “an organisation's absorptive capacity will depend on the absorptive capacities of its members” and that “a firm's absorptive capacity is not simply the sum of the absorptive capacities of its employees”. While technology can facilitate the transfer of information, the conversion to knowledge is believed to be achieved with social interactions [2]. Moreover, yet, when researching ACAP, nearly all research is from the perspective of organisations [22], [41]. Research into individual ACAP has been neglected [22, 23].
2.4. Understanding Absorptive CAPacity (ACAP)

Cohen and Levinthal [4] first introduced the concept of ACAP as an organisation’s capability to absorb information. Zahra and George [42] further developed a conceptual framework illustrating ACAP. While this framework was developed for organisations, research has used it at an individual scope [22]. This framework recognises four different capabilities in the absorption process:

- **The acquisition** is the first capability where the object of knowledge is acquired [42]. In this capability, trust between all parties, identifying the recipient's knowledge gap and evaluating available processes and tools are all critical [17].
- In the **Assimilation** capability, the knowledge is extracted from the object [42]. The communication channel and processes must be sound for the assimilation to be effective [17].
- **Transformation** is where processes are re-configured so that the newly acquired knowledge can be exploited [42]. The existence of prior knowledge processes affects this step [17], [35]. The deeper the prior knowledge processes are ingrained, the more time and effort it will take to unlearn and relearn the new process [35].
- **Exploitation** is the final capability. Here, knowledge is used, and its value is returned [42]. Exploiting knowledge is often viewed as a successful demonstration that knowledge has been absorbed [17].

These four capabilities are interdependent [42]. Acquisition and Assimilation are considered Potential Absorption CAPacity (PACAP) because knowledge has still not yet been incorporated [42]. Transformation and Exploitation are referred to as Realised Absorption CAPacity (RACAP) as knowledge has been incorporated [42].

At the individual level, ACAP represents an individual's dynamic capability to absorb knowledge. Social integration mechanisms are also recognised to be factors of ACAP [42]. Individuals with a large number of network connections outside their discipline have higher ACAP [22]. The internet as a technology potentially enables social interactions and stimulates said social connections [1], [14], [24]. Finally, bisociative learning methods were more effective than associative [22]. As mentioned before, knowledge is only valuable when it is accessible and needed [18]. The process of knowledge transfer is time-consuming [35]. Individual ACAP is a time-related process. Experience is an element of knowledge [6], which is an antecedent to the individual ACAP [42]. When an individual's experience is contrary to the knowledge that is absorbed, the ACAP process can be slower [35], [38] as the individual must first unlearn their prior experience [35]. As the experience is deeper, more time will be required to unlearn it [35]. This framework is not hard defined; it is dynamic [42]. A capability is dynamic when its resources and competencies are combined with expanding its dimensions to gain an advantage [37]. Said resources can be developed, deployed and protected while said competencies can be internal or external [37]. Its environment influences dynamic capability. As technologies omnipresence is unlikely to regress in particular with the advent of the internet of things, technology is embedded in contemporary environments.

2.5. The Benefits of Technology

Technology enables the transformation of content and pedagogy [1], [19]. In 1990s, American campuses introduced assistive technologies to students with learning disabilities [7]. The introduction of word processors enabled iterative writing process, which allowed students to write better assignments [5]. These students would still benefit from using these technologies beyond tertiary education [31].

Technology can easily transform data into information; however, it is ineffective at transforming information into knowledge [2]. Technology is thought to be unable to reconfigure how it presents knowledge; hence, it is believed to be incapable of catering to the recipient’s perspective [2]. With the advancement in technologies and Artificial Intelligence (AI), the belief that technology is ineffective in said transformation is being
2.6. Technology Readiness (TR) Dimensions are Individual Specific

Technologies are unpredictable as they are constantly changing [13]. With the rise of self-serving technologies, the industry needed a framework to better profile their customers [26]. The Technology Readiness Index (TRI) measures people's predisposition towards technology [26]. As self teaching technologies and dynamic e-learning is advancing [24], the TRI is instructive. Indeed, TRI has been streamlined into a new version, TRI 2.0, retaining the four following core dimensions [27].

- **Optimism** is the belief that technology offers more control, flexibility and efficiency [26].
- **Innovation** is the trend where technology is a leader or pioneer [26].
- **Insecurity** measures scepticism and distrust towards technology [26].
- **Discomfort** represents the feeling of being overwhelmed by technology and its perceived lack of control [26].

Optimism here is in the context of technology, whereas Szulanski [34] discovery that motivation was not a barrier differs as it was in the context of knowledge. TR is an individual specific [20], which makes it better aligned with individual ACAP.

2.7. The Universities Core Function is Knowledge Generation and Transfer

Research in education conducted in classrooms yielded more relevant results than research conducted in laboratories because the context of experimentation was live, which made implementation easier for teachers [33]. As universities core function is knowledge and its transfer, universities would be the preferred setting to research the effect of TR dimensions on individual ACAP.

3. Theoretical Background and Hypothesis Development

As discussed above, knowledge management and transfer are important for organisations to succeed [8], [10], [18]. The three barriers to organisations knowledge transfer are causal ambiguity’, the rapport between knowledge holder and recipient ACAP [34]. Horizontal organisational structures appear to be an effective solution to causal ambiguity and rapport between knowledge holder and recipient [18], [36], [38]. Organisations learn through its members [4], and yet, research into the recipient’s ACAP remains neglected [22, 23], [41]. Individual ACAP is a dynamic capability [42], which is affected by its environment [37]. The introduction of technologies in American campuses improved students capabilities beyond their education [7], [31]. Technology is an enabler [21]. Technologies are constantly changing into unpredictable forms [13]. Organisations use technology only as a knowledge source [2]. While the content and its context are important for knowledge transfer, technology can enhance learning [13]. Technology affects individual ACAP.

While several frameworks have been developed to measure people's behaviour towards technology, the TR has the advantage to be individual specific [26] which is analogue with the tacit aspect of knowledge and thus aligns with the scope of individual ACAP. The ideal context for this research would be universities as they are dedicated to knowledge generation and transfer, and they have diversity in population and knowledge disciplines. Figure 1 shows the research model.
3.1. Hypotheses Development

Optimism and Innovation are considered to be motivators as they motivate individuals to use technology [26]. Insecurity and Discomfort are viewed as inhibitors as they inhibit technology adoption [26]. Optimism is defined as “a positive view of technology and a belief that it offers people increased control, flexibility, and efficiency in their lives” [26]. The use of the word ‘belief’ infers that it is not real; it is potential. Insecurity is defined as “distrust of technology, stemming from scepticism about its ability to work properly and concerns about its potentially harmful consequences” [26]. The use of the word ‘potential’ is explicit. As Optimism and Insecurity are respectively motivators and inhibitors [26], these are hypothesized to correlate with potential ACAP (PACAP).

H1: Optimism is positively associated with individual PACAP.
H2: Insecurity is negatively associated with individual PACAP.

Innovation is defined as “a tendency to be a technology pioneer and thought leader” [26]. The tense of the sentence implies that Innovation is in the present state; hence, it is real. As Innovation and Discomfort are respectively motivators and inhibitors [26], these are hypothesized to correlate with RACAP. Discomfort is defined as “a perceived lack of control over technology and a feeling of being overwhelmed by it.” [26]. These are hypothesized to correlate with realised ACAP (RACAP).

H3: Innovation is positively associated with individual RACAP.
H4: Discomfort is negatively associated with individual RACAP.

However, Walczuch et al. [40] discovered that Innovation could also be perceived negatively.

H5: Innovation is negatively associated with individual RACAP.

4. Research Methodology and Future Work

This research will use a survey method for data collection in Australian universities. Previous studies validated survey measurement will be revised and used in order to ensure measurement reliability and validity. Moreover, an expert will examine the survey to confirm that the survey instrument adequately measures each factor.

Partial Least Squares (PLS) Structural Equation Modelling (SEM) will be used to test the hypotheses. The Partial Least Squares (PLS-SEM) does not require a large sample size[11, 12] and works better than covariance based (CB-SEM) techniques [15]. The PLS is now a well-established analysis method in business information systems research. Furthermore, for additional findings and conclusions for managerial actions, Importance-performance map analysis (IPMA) [32] will also be conducted to elaborate the results further.

References


