

Individual and Contextual Antecedents of Knowledge Acquisition Capability in Joint ICT Project Teams in Malaysia

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Abstract: This study investigates the significance of joint ICT projects with foreign partners in the acquisition of knowledge by local personnel in an emerging economy, based on the perspective of individual's absorptive capacity (i.e., ACAP). The model conceptualizes knowledge acquisition capability as the individual dimension of ACAP and posits differences in prior experience and learning orientation as well as individual's perception of partner's support as antecedents to local employees' abilities to (i) recognize the value of and (ii) assimilate foreign partners' embedded knowledge. This model was validated by the results of the structural equation modelling, conducted on a cross sectional survey of 205 local team members of joint ICT projects in Malaysia. All the hypothesized relationships were supported, with the exception of that between prior experience and ability to recognize the value of knowledge as well as learning orientation and ability to assimilate knowledge. Accordingly, the theoretical and practical implications of the findings were expatiated, with suggestions offered on the areas for future research.

1 INTRODUCTION

In support of the national drive towards attaining the knowledge based economy, the Malaysian Government has acknowledged technology parks as platform to facilitate the engagement of world's leading firms in the local economy. One of the major milestones was the establishment of the multimedia super corridor (MSC) in 1996. The MSC was inaugurated in order to advance the country to the cutting-edge of the burgeoning information and communications technology (ICT) industry. The MSC has succeeded in attracting multinational corporations (MNCs) and international joint ventures, thereby facilitating the growth of local ICT talents and firms, through access to foreign knowledge and expertise. The knowledge inflow has been associated with institutional and policy intervention (Ramasamy et al., 2004), inter-firm interaction (Richardson et al., 2012; Malairaja and Zawdie, 2004), as well as firm and employees characteristics (Awang et al., 2013).

Absorptive capacity (ACAP) is one of the most significant characteristics of a firm with a constraining impact on the acquisition of external knowledge (Lyles and Salk, 1996; Lane et al., 2001;

Raman et al., 2014). Based on R&D activities, an organisation builds internal capability, as the employees gain exposure and insight to new concepts, and incorporate the learning into the firm's activities, thereby expanding the knowledge bases (Cohen & Levinthal, 1990). In essence, by sharing experience and learning, the personnel facilitates both the individual and collective capacity to respond to changes. Therefore, both the individual members and the context of their engagement are critical to the firm's ACAP. However, extant studies have overlooked the underlying role of individuals, but ACAP has repeatedly been associated with the organisational and dyadic antecedents (Lane and Lubatkin, 1998; Jansen et al., 2005). Consequently firm's heterogeneity have been isolated from differences at the individual level, thereby dissociating organisational level outcome from the underlying choice and actions of the members (Volberda et al., 2010; Felin et al., 2012).

Despite the recent studies hypothesizing individual level antecedents as prior experience (Lane et al., 2006; Minbaeva et al., 2003; Zhao and Anand, 2009), cognition (Zahra and George, 2002), and task motivation (Silva and Davis, 2011; Ojo and Raman, 2015), limited attempts have been offered to

empirically clarify these antecedents. Specifically, the effects of individual differences on the associated dimensions of ACAP have been overlooked, while data have mostly originated from single respondent or proxy measures used to infer individual differences. Consistent with the dynamic capability perspective, clear delineation of the individual characteristics and interaction pertinent to learning capabilities could offer clarification on the path to strategic renewal (Teece, 2012). Therefore, further to the extant emphasis on organisational mechanisms, individual difference is another important building block to organisational change.

Given the above, the present study investigates the underlying differences and the implication of the context of engagement on individual's ACAP. The context is the asymmetrical joint project teams, set up to facilitate the transfer of knowledge from expatriate to local employees in the Malaysian ICT industry. In line with recent conceptualization on micro-antecedents, we argued that the local team members of the joint project teams must demonstrate the right aptitude and disposition, in order to acquire the foreign knowledge. The next section presents the theoretical background for our propositions, after which the research method is explained. This encompasses sub-sections on the sample and procedure, measurements, as well as analysis and results. Furthermore, we discuss the theoretical and practical implications of our findings. Thereafter the concluding section considers the limitations of the present study and offers relevant suggestions for future research.

2 THEORETICAL BACKGROUND

From the individual level perspective, ACAP can be considered as the capacity to learn or acquire knowledge (van den Bosch et al., 2003). Thus, an organisation learns through the individual members, who acquire knowledge by interacting and sharing experience with others (von Krogh et al., 1994; Crossan et al., 1999). Organisational knowledge can be embedded in people, routines, processes, tasks or tools, nevertheless, people's ability in adapting knowledge across different context is exceptional and unique (Argote et al., 2003). Although, the management can coordinate knowledge transfer by motivating the local personnel, and also facilitate the organisational processes to support strategic renewal (Lyles and Salk, 1996), nevertheless, without the

personnel demonstrating the learning capability, the acquisition of partner's knowledge is unrealistic. To this end, the learner's knowledge receptive capability, i.e. ACAP has been established as the key determinant to learning in joint project teams (Inkpen, 2008).

The present study explicates the role of individuals in ACAP, in particular, within the context asymmetric project team, set up to facilitate knowledge transfer. The external knowledge is the expertise possessed by the expatriate, but accessible to the local employees through their engagement in the joint project teams. Theorists have mainly ascribed individual differences to dispositions towards thinking, goals, values or beliefs (Lubinski, 2000; Schmitt et al., 2003). Therefore, we posit that the knowledge acquisition capability, i.e. ACAP is a function of the variation in individual's experience, disposition to learning. Furthermore, we hypothesize the effect of the context of their engagement in terms of partner support on the local personnel's ACAP.

The above proposition is premised on the notion that individual ACAP constitutes one of the building blocks to organisational ACAP (Zahra and George, 2002; Raman et al., 2014). Thus, consistent with Zahra and George's (2002) theoretical exposition of potential ACAP as an individual level capability, we consider the two associated dimensions. First is the ability to recognize the value of partner knowledge, which is operationalized as the individual capability to search, identify, and accurately evaluate the worth of the knowledge (Ojo et al., 2014). The second dimension is the ability to assimilate knowledge, which is the individual capability to learn, interpret and develop a deep understanding on valuable knowledge (Nemanich et al., 2010). The subsequent subsections examine the underlying hypotheses for the above proposition.

2.1 Prior Experience

Cohen and Levinthal (1990) emphasize the cumulative impact of learning, whereby individual's earlier learning influences the ability to learn new things. Prior experience has corresponding effect on the locus and extent of search for external knowledge (Lane et al., 2006). Seeley and Targett (1999) found that individual's knowledge in a given task diminishes as he/she engages less in updating his/her knowledge about the task. Van Riel and Lievens (2004) found that experienced marketing researchers possess higher capability to interpret and assimilate emerging market trend and incorporate such into the design of new offerings. Based on a

sample of 208 engineers, Deng et al. (2008) established the positive impact of prior engagement in problem solving on innovative capability. Based on prior experience, individuals accumulate knowledge in the memory, which enable them to recognize and assimilate related external knowledge. Thus, employees with related knowledge as that embedded in foreign partner are hypothesized to possess the ability to access the partner's valuable knowledge as well as target it for assimilation. To this end, the following hypotheses are put forward:

- H1a. Prior experience in related knowledge is positively associated with the ability of an individual to recognize the value of foreign partner knowledge in a joint project team.*
- H1b. Prior experience in related knowledge is positively associated with the ability of an individual to assimilate foreign partner knowledge in a joint project team.*

2.2. Learning Orientation

This is the strong disposition towards improving competence by developing new skills and taking up challenging tasks (Bell and Kozlowski, 2002). By taking learning as personal responsibility, an individual inclination is towards acquiring new knowledge underlying the development of competence (Hansen, 1999). Proactive minded individuals are well disposed and attentive to others' experience, as well as understanding and interpretation on given concept (Ayas, 1998; Hansen, 1999). Thereby strong orientation towards learning could impact on the willingness to put in the extra effort needed to acquire complex skills and improve the knowledge based (Bell and Kozlowski, 2002; Laursen and Salter, 2006). Empirical research on absorptive capacity within the R&D domain (Howell and Shea, 2001) found the positive impact of individual search effort on the identification of valuable external knowledge. Also, Yeh (2008) investigation on middle level engineers, confirmed self-initiated learning as antecedent for performance. Thus, the following hypotheses are suggested.

- H2a. Learning orientation is positively associated with the ability of an individual to recognize the value of foreign partner's knowledge in a joint project team.*
- H2b. Learning orientation is positively associated with the ability of an individual to assimilate foreign partner's knowledge in a joint project team.*

2.3 Partner's Support

Given the competence gap between the partners, the acquisition of knowledge by the local personnel could be facilitated through the technical support provided by the foreign partners. Scholars (Lane et al., 2001; Lyles and Salk, 1996) have demonstrated the provision of training and technological assistance, as the support mechanisms relevant in enabling technological acquisition in joint ventures. The acquired knowledge is easily institutionalized, when the transferor becomes actively engaged in supporting the acquirer to adapt it within the specific context (Steensma and Lyles, 2000; Kasuga, 2003). For instance, the expatriate could support the local employees to acquire related understanding on the specific practices, thereby enabling the latter to assimilate the knowledge (Inkpen, 2008; Dyer and Nobeoka, 2000). Dhanaraj et al. (2004) assert that as interactions deepen between partners the collaboration becomes seamless. This is consistent with Inkpen's (2008) findings on the strategic alliance between GM and Toyota. The lack of support by the grafted managers, contributed in GM's initial inability to appreciate the value of Toyota Production Systems (TPS). In addition, the empirical significance of organisational support has been demonstrated in the transfer knowledge to new hires or trainee employees (Simosi, 2012). Thus, in line with the above, we hypothesize that;

- H3a. Individual's perception of foreign partner support is positively associated with the ability of an individual to recognize the value of partner's knowledge in a joint project team.*
- H3b. Individual's perception of foreign partner support is positively associated with the ability of an individual to assimilate partner's knowledge in a joint project team.*

2.4 Individual Absorptive Capacity

The individual members of the firm play the significant role of absorbing knowledge from the external sources. Zahra and George (2002) argued that an organisation needs to first acquire and assimilate external knowledge before effort could be concentrated towards the exploitation of such knowledge. To this end, they delineate ACAP into potential and realized components corresponding to individual and collective levels, respectively. The latter is dominant at the individual level and expressed as the abilities to (i) recognize the value of and (ii) assimilate external knowledge. Thus,

individuals are not just resources possessed by the firm, but enabler of the process for the firm's transformation, i.e., through the acquisition of external knowledge. Proponents of innovation theory have acknowledged the significant role of individuals in learning from firm activities (Nelson and Winter, 1977; Allen, 1977). For instance R&D activities can be considered as firm's investment in building employees' capability to search for internal technological and organisational knowledge.

An individual's ability to assimilate external knowledge is conditioned on his/her ability to recognize how such knowledge relates to the cognitive map already stored in the memory (Todorova and Durisin, 2007). The cognitive map is the pattern of association that impacts an individual's search for and categorization of new information (Tripsas and Gavetti, 2000). This map enables an individual to exert the knowledge search effort on an area with the most significant value to the assigned task. Thus, the aptitude of an individual in recognizing the value of knowledge can be associated with efficient search effort, which in turn can facilitate his/her commitment to understand the specific valuable knowledge (Lettl et al., 2008). The investigation of Nemanich et al. (2010) on U.S.-based research teams supported the positive relationship between the ability of the team member to evaluate external knowledge and the ability to assimilate the knowledge.

H4. Individual's ability to recognize the value of foreign partner's knowledge is positively associated with the ability to assimilate the knowledge in a joint project team.

3 METHOD

3.1 Sample and Procedure

A random sample of local ICT professionals engaged in joint projects with expatriates was selected across 62 joint ventures on the list of active MSC-status companies. To facilitate the data collection, human resource (HR) personnel in each firm was designated as contact persons. The contact persons were requested to randomly select ICT project teams constituted by the local personnel and expatriates in their respective firms, and to administer the questionnaires on the former. They were specifically instructed to select two to three local personnel who were directly attached with the expatriates from each of the identified project team.

Out of a total of 390 questionnaires sent out, 205 valid responses were returned, corresponding to an overall response rate of 52.6 percent. In order to ascertain the absence of non-response bias, we obtained the demographic profiles for the non-respondents from the contact person. Accordingly, series of χ^2 and t test were computed to compare the respondents (n= 205) with those who had not completed the questionnaires (n= 185). Based on the outcomes, responses were found not to be selective for age, education level, work experience, joint team tenure, as well as job position ($p > 0.05$).

The demographic profiles of the respondents are presented as follow. More than 81 percent of the respondents were above the age of 26 years, and 73.1 percent had at least a bachelor degree. Moreover, 67.8 per cent of the respondents had acquired professional experience of at least four years, while two-thirds of the respondents had been engaged in at least two joint project teams. In terms of job positions, almost half of the respondents (49.8 percent) were system analysts, while 17.5 per cent were project managers. Programmers and system designers made up 16.2 and 12.4 percent of the total respondents, respectively, and the remaining 4.1 percent accounted for other positions, such as testers and technical support.

3.2 Measurements

All the constructs were measured with scales adapted from extant literature, and the assessment based on the five-point Likert scale (ranging from 1 = strongly disagree to 5 = strongly agree). We conducted the pilot testing for the initial questionnaire, with a sample of 35 respondents selected from across the joint ventures ICT firms on the list of active MCS-status companies. These respondents were excluded from the final survey. The majority of the respondents (i.e. 55%) are within the age group of 26 – 35 years, followed by those within 36 – 45 years (i.e.19%). More than 68% had at least a bachelor degree and about 70% had acquired professional experience of at least four years. Moreover, 75% of the respondents have been engaged in at least 2 joint project teams and 55% of them are system analyst. Based on their comments and statistical assessment, some of the questions were rephrased to improve clarity and content validity. In addition, we ensured that the anonymity of the respondents were preserved, as promised in the enclosed cover letter, thereby minimizing the effects of social desirability and biasness associated with self-reported survey.

Prior experience was operationalized as the quantity of the accumulated knowledge that is related to the new external knowledge (Cohen and Levinthal, 1990). Thus, respondents were asked to assess the extent to which they agree with five (5) statements describing the level of their possessed general and theoretical knowledge (Gimeno et al., 1997), training, work experience and expertise (Cooper et al., 1994; Huber, 1991) on the project. The Cronbach’s alpha for this construct was 0.91.

Learning orientation was operationalized as the disposition to ask mastery and measured with five adopted from VandeWalle (1997). The Cronbach’s alpha for the constructs was 0.92.

The measurement scale for partner’s support consists of three items obtained from inter-firm knowledge transfer literature (Lyles and Salk, 1996; Lane et al., 2001; Minbaeva et al., 2003). These items assess the extent to which the foreign employees are accessible and helpful, and actively participated in the joint project.

The ability to recognize the value of partner’s knowledge was operationalized as the capability to accurately evaluate the worth of knowledge and the ability to assimilate partner’s knowledge was operationalized as the capability to learn, interpret, and develop a deep understanding of valuable knowledge (Nemanich et al., 2010; Ojo et al., 2014). Both were measured by two different sets of four items. Specifically, the respondents were asked to assess the extent to which they agree with certain statements that describe their engagement in joint project teams. The Cronbach’s alpha was 0.89 and 0.88 for the ability to recognize and the ability to assimilate partner’s knowledge, respectively.

3.3 Analysis and Results

In order to ascertain the non-significance of common method variance, the Harman’s one-factor test was conducted (Podsakoff and Organ, 1986). The outcome from the single un-rotated EFA on all the constructs revealed the absence of common factor. The largest factor accounted for 32.71% of the total 74.70% variance explained by all the five factors, with eigenvalues greater than 1.00. Consequently, the overall measurement model for the five constructs was evaluated in a single CFA procedure (Anderson and Gerbing, 1988). All the items loaded on their specified factors. The composite reliability (CR) and average variance extracted (AVE) values were computed from the CFA loadings. As shown in Table 1, the AVE and CR values are above the cut-off criterion of 0.50 (Fornell and Larcker, 1981) and

0.7 (Hair et al., 2010), respectively. Thus, convergent validity was demonstrated for all of the constructs.

Table 1: Measurement Scales and Standardized CFA Estimates.

Constructs and items	Std. Est
<i>Prior Experience (CR = 0.91; AVE = 0.68)</i>	
I had the required general knowledge on the project.	.806
I had acquired substantial theoretical knowledge.	.852
I had attended extensive training in related area.	.811
I had substantial working experience in related area.	.847
I had acquired some level of expertise in related area.	.731
<i>Learning Orientation (CR = 0.92, AVE=0.69)</i>	
I am willing to pursue challenging tasks from which I can learn new things.	.756
I often look for opportunities to develop new skills and knowledge.	.797
I prefer taking up challenging and difficult tasks at work from which I can learn new skills.	.913
I am willing to put in extra effort where necessary to develop new skills and enhance my knowledge.	.872
I prefer to work in environments that require a high level of ability and talent.	.796
<i>Partner’s Support (CR=0.87, AVE=0.69)</i>	
I received adequate technical support from the foreign partner	.654
I received relevant training from the foreign partner	.745
I received timely and helpful assistance from foreign partner	.895
<i>Ability to Recognize (CR = 0.88, AVE=0.64)</i>	
I was able to develop awareness on partner’s knowledge.	.842
I was able to keep track of partner’s knowledge, by consulting other sources of information.	.833
I was able to identify partner’s knowledge with the most significant value to the project performance.	.827
I was capable at accurately evaluating the worth of partner’s knowledge in the project.	.691
<i>Ability to Assimilate (CR = 0.89, AVE=0.66)</i>	
I was able to learn the use of partner’s knowledge.	.801
I was capable at understanding the knowledge associated with project.	.850
I was adept at interpreting the use of the knowledge associated with the project.	.845
I tried to experiment with the knowledge associated with the project.	.748

Sequel to the above, the structural model was evaluated by replacing the covariance paths (i.e. double edged arrows) associated with the endogenous variable with the hypothesized structural paths (i.e. single edged arrows). The selected goodness-of-fit indices from the AMOS 18 package revealed a good fit to data (i.e. $\chi^2 = 127.765 / p=.390$; RMSEA = .011 / p-close = 1.000; CFI = .997, TLI = .997). Specifically, the value of p for the χ^2 was not significant, i.e., > 0.05 , thus the model can be regarded as acceptable (Bagozzi and Yi, 2012). As a result, the model was employed in testing the hypothesized effects.

As shown in Figure 1, the relationship between prior experience (E) and the ability to assimilate knowledge (A) was significant ($\beta = .16, p < .05$), however, the relationship between the former and ability to recognize the value of knowledge (R) was not significant. Thus, H1b was supported, but H1a was not supported. The path from learning orientation (L) to ability to recognize the value of knowledge was significant ($\beta = .43, p < .001$), but the path to ability to assimilate knowledge was not. Thus, H2a was supported, but H2b was not supported. Furthermore, both H3a and H3b were supported, with a significant path obtained from partner's support (P) to ability to recognize the value of knowledge ($\beta = .18, p < .05$) and ability to assimilate knowledge ($\beta = .22, p < .01$), respectively. Finally, the individual's ability to recognize the value of knowledge was determined to be significantly related to the ability to assimilate knowledge ($\beta = .58, p < .001$). Thus, H4 was supported.

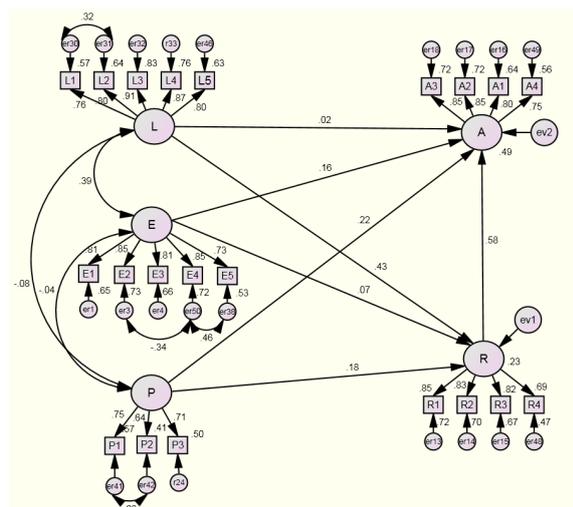


Figure 1: Standardized Path Estimates.

4 DISCUSSION

The present study advances the dynamic capability perspective to develop a model which demonstrates the role of team members and the context of their engagement in strategic renewal, thereby suggesting individual differences as another antecedent of learning, in addition to the widely acknowledged organisational and environment factors (Teec, 2012). Specifically, the current study investigates the pertinent antecedents of the individual ACAP, thus contributing to extant literature in several aspects.

Further to the theoretical notion on the existence of potential ACAP at the individual level (Zahra and George, 2002) this study empirically validates its pertinent dimensions, i.e. ability to recognize the value of and ability to assimilate foreign partner's knowledge. As revealed in this study, individuals that have recognized the value of foreign partner's knowledge in their assigned task are able to develop better understanding on the relevance of such knowledge in the joint project team. Thus, the recognition of the value of knowledge can facilitate deeper assimilation, in that the effort could be fully channelled toward uncovering the underlying knowledge bases.

Our findings corroborate the varying effect of prior experience on ACAP (Cohen and Levinthal, 1990; Minbaeva et al., 2003). We found that the prior experience acquired by an individual in an area related to the joint ICT project could impact on his / her ability to assimilate the partner's knowledge (i.e. H1b). Surprisingly, the former was determined not to be associated with the ability to recognize the value of partner's knowledge (i.e. H1a). Even though this challenges the theoretical notion on ACAP, yet, it conforms to Lane and Lubatkin's (1998) findings – firm's engagement in R&D (i.e., knowledge acquisition) was not related to the variance of ACAP. This outcome is also in line with the path dependence nature of learning. Individual's understanding could deepen with the possession of prior related knowledge, but this might have little or no appreciable impact on his/her ability to recognize the value of knowledge. According to Cohen and Levinthal (1990) an individual's mental model accumulated in the memory evolves along the path of his/her exposure. Therefore, unless concerted effort is channelled toward exploring new things, an individual's interpretation of future phenomena could be limited by the mental model.

Moreover, individual's learning orientation was significantly associated with the ability to recognize

the value of knowledge, i.e., H2a, but not ability to assimilate knowledge, i.e. H2b. This reinforces the complementary nature of prior related knowledge and learning disposition (Cohen and Levinthal 1990). Except concerted effort is exerted to exploring new things, individual's interpretation of new concept could be limited by the mental model already registered in the memory. Crossan et al. (1999) revealed that the ability to recognize new knowledge is conditioned on the recognition of a similar pattern in the memory. Learning-oriented people are opened to experiencing new things (Brett and VandeWalle, 1999) and self-directed (Yeh, 2008). Thus, they are more likely to break barriers and cross boundaries in their drive towards task mastery, especially when they perceive their skill set as inadequate. As a result, their disposition is suited to putting in the necessary effort towards uncovering patterns related to that already stored in the memory, thereby facilitating the recognition of the value of new knowledge.

As hypothesized, foreign partner's support was determined to be associated with both ability to recognize the value of knowledge and ability to assimilate knowledge. Given the asymmetric nature of the joint project, knowledge acquisition by the local team members could be fast tracked when the foreign partners facilitate the adaption and dissemination of the embedded knowledge to the former. The target knowledge is tacit and embedded in practice so that team member interactions can enable stronger ties and the sharing of experience and perspective. By providing adequate support to and engaging actively with the local partner, the foreign partner can deepen the strength of social ties within the joint project team (Uzzi & Lancaster, 2003). Thus, the extent of support provided by the expatriates grafted into the joint project team, as perceived by the local members, could impact the acquisition of knowledge.

Our findings have implications for the management of joint ICT project teams in Malaysia. It is essential that the managerial and leadership drive for the upgrade of local capability through the acquisition of competent partners' knowledge be supported with the engagement of personnel with the underlying learning capabilities. In addition to the organisational norm of recruiting experienced personnel, the management should also consider their disposition to learning. The ability to recognize the value of new knowledge requires the commitment of effort towards uncovering patterns related to that already stored in the memory. Therefore, individual learning disposition

complements prior related experience in order to facilitate the recognition and assimilation of new knowledge. With respect to the significance of foreign partner's support, the local partner should ensure that the contractual agreement with the former explicitly state the level of support to be provided to the local team members. By ensuring supportive collaboration, the local team members of the joint project teams could be enabled to identify and assimilate the knowledge embedded in the foreign partner. This could enable them to develop close relationship with and be connected enough to the expatriates to seek clarification, when relevant, without fear of rejection. Basically, when the expatriates are perceived as helpful, the local members are better disposed to approach them for assistance. Likewise, the former will take proactive measures to facilitate problem resolution. Furthermore, the ability to assimilate knowledge requires the development of deeper insight, which is evident in the mastery of procedures / methods underlying the task.

5 CONCLUSIONS

This study advances the micro-level perspective of ACAP, by demonstrating the effects of individual differences and the context of their engagement on knowledge acquisition capability. Thus, further to the clarification of the role of individuals in the acquisition of knowledge from joint project teams, this study also offers opportunities for further research. Future studies should attempt to clarify the effects of other antecedents on both the individual and collective components of ACAP. There is also need for study to investigate the mechanisms through which individual components are linked to the collective components. The impact of cultural differences on ACAP within joint project is another important area for future studies. Furthermore, subsequent studies are expected to address some of the limitations of this study. The use of longitudinal design is recommended, so as to capture the underlying temporal and causal effects of ACAP. Also, the attendant weakness of the self-reported survey could be minimized by incorporating data from other sources. For example, future studies should consider the perspective of the foreign team members on the ACAP dimensions. Finally, the validated model should be extended to other contexts, in order to ascertain the generalization of the findings.

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